

Evaluatie basisnormering chemische belasting op de werkplek.

Deel I: Prioritering van stoffen voor het vaststellen
van wettelijke grenswaarden op basis van gezond-
heidskundige overwegingen.

S 187

Nederlands Instituut voor Arbeidsomstandigheden



NIA1097601

150,-
(dl.1+dl.2)

TNO-rapport V 95.228

Evaluatie basisnormering chemische belasting op de werkplek.

Deel 1: Prioritering van stoffen voor het vaststellen van wettelijke grenswaarden op basis van gezondheidskundige overwegingen.

Auteurs:

Prof. Dr. V.J. Feron
Drs. L.C.M.P. Hontelez
Dr. P.C. Noordam
Drs. M.V.W. Wijnands
Dr. R.A. Woutersen

In opdracht van:

Ministerie van Sociale Zaken en Werkgelegenheid
Directoraat-Generaal van de Arbeid
Den Haag

Projectnummer:

354695

Datum:

September 1995

Alle rechten voorbehouden.

Niets uit deze uitgave mag worden vermenigvuldigd en/of openbaar gemaakt door middel van druk, fotokopie, microfilm of op welke andere wijze dan ook, zonder voorafgaande toestemming van TNO.

Indien dit rapport in opdracht werd uitgebracht, wordt voor de rechten en verplichtingen van opdrachtgever en opdrachtnemer verwezen naar de 'Algemene Voorwaarden voor Onderzoeksopdrachten TNO', dan wel de betreffende terzake tussen partijen gesloten overeenkomst.

Het ter inzage geven van het TNO-rapport aan direct belanghebbenden is toegestaan.

© TNO

Nederlands Instituut voor
Arbeidsomstandigheden NIA
bibliotheek-documentatie-informatie
De Boelelaan 30, Amsterdam-Buitenveldert

ISN-nr.

plaats

datum

29.054

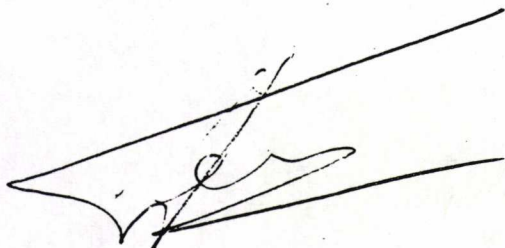
Ger. 4, S107 I

08 OKT. 1996



Verantwoording

Auteurs:



Prof. Dr. V.J. Feron

Datum:

22/09/95

Voorzitter WGD. Toxicoloog, TNO Voeding, Divisie Toxicologie, Afd. Pathologie.

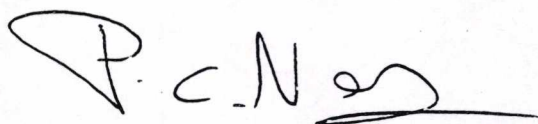


Drs. L.C.M.P. Hontelez

Datum:

12/9/95

Toxicoloog, werkzaam bij Afd. Onderzoek van het Ministerie van Sociale Zaken en Werkgelegenheid.



Dr. P.C. Noordam

Datum:

11/9/95

Toxicoloog, Hoofd Afd. Arbeidsmilieu van het Ministerie van Sociale Zaken en Werkgelegenheid.

Heeft zitting in de Commissie WGD van de Gezondheidsraad namens SZW.

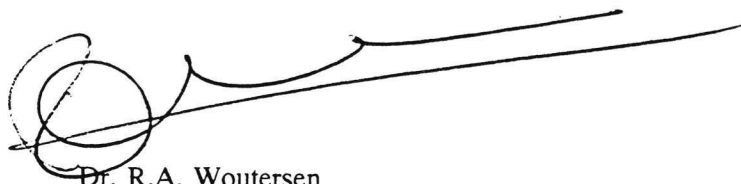


Drs. M.V.W. Wijnands

Datum:

30 augustus 1995

Toxicologisch patholoog, TNO Voeding, Divisie Toxicologie, Afd. Pathologie.



Dr. R.A. Woutersen

Datum: 22 September 1995

Toxicoloog, Hoofd Afd. Pathologie, TNO Voeding, Divisie Toxicologie.

Goedgekeurd door:



Dr. N.J. Snoeij

Datum: 22 September 1995

Hoofd Divisie Toxicologie, TNO Voeding.

Inhoud

Verantwoording	2
Inhoud	4
1 Inleiding	5
2 De Nederlandse MAC-lijst	5
3 Methode voor validering van bestaande MAC-waarden	6
4 Selectie van stoffen	7
5 Resultaten	8
5.1 Indeling in vier categorieën	8
5.2 Toekennen van rangnummers in categorie 3	9
6 Discussie	9
Literatuur	10
Tabellen	11
Bijlagen	18

1 Inleiding

De Nederlandse MAC-lijst is voor het eerst gepubliceerd in 1978. De grenswaarden in deze eerste editie zijn bijna zonder uitzondering overgenomen van de Threshold Limit Value (TLV)-lijst van de American Conference of Governmental Industrial Hygienists (ACGIH). Vanaf 1976 is de overheid begonnen met het ontwikkelen van "eigen" Nederlandse grenswaarden voor de werkplek volgens de zogenaamde drietrapsprocedure, waarin een wetenschappelijke evaluatie van de toxicologische dataset van de chemische stoffen de belangrijkste basis vormt (zie bijlage 2). Deze procedure voor het vaststellen van grenswaarden gaat echter langzaam; jaarlijks worden er gemiddeld zo'n tien tot vijftien MAC-waarden (sinds 1994: wettelijke grenswaarden) vastgesteld door het ministerie van Sociale Zaken en Werkgelegenheid. Gezien het beperkt aantal wettelijke grenswaarden dat per jaar wordt vastgesteld is het van belang, dat er met prioriteit grenswaarden worden ontwikkeld voor stoffen waarvoor dit het meest nodig is, te weten stoffen waaraan veel werknemers in Nederland worden blootgesteld, en/of waarvan de blootstelling zodanig hoog is dat gezondheidsschade niet onaannemelijk is. Tevens kan de aard van de gezondheidsschade een rol spelen.

Het doel van het project "Evaluatie Basisnormering Chemische Belasting" is het rangschikken van de stoffen uit de Nationale MAC-lijst (editie 1994) naar prioriteit waarmee ze in de Nederlandse procedure voor het vaststellen van wettelijke grenswaarden ingevoerd zouden moeten worden.

In het eerste deel van het onderzoek vormen de toxicologische gegevens waaraan de MAC-waarden ten grondslag liggen het uitgangspunt voor prioritering. Op basis hiervan wordt een oordeel gegeven over de validiteit van de huidige MAC-waarde.

In het tweede deel van het onderzoek worden de mate en frequentie van blootstelling en het aantal in Nederland blootgestelde werknemers als basis gebruikt voor het aangeven van het belang van de verschillende stoffen. Vervolgens worden de gegevens uit het eerste en tweede deel van het onderzoek gecombineerd. Het resultaat is een set gegevens waaruit de prioriteit voor het vaststellen van een wettelijke grenswaarde voor de betreffende stoffen afgeleid kan worden.

2 De Nederlandse MAC-lijst

De Nederlandse MAC-lijst 1994 (P145) bevat 653 stoffen of groepen van stoffen met een grenswaarde. In eerste instantie zijn de meeste van deze stoffen zonder nadere beschouwing van de onderliggende

toxicologische gegevens overgenomen uit het buitenland. Met name de TLV-lijst van de ACGIH vormt dé bron waaruit grenswaarden zijn geput. In de loop van de jaren is in verschillende publikaties in wetenschappelijke tijdschriften twijfel geuit over de mate van bescherming die de TLV's aan blootgestelde werknemers biedt (Castleman and Ziem 1988; Roach and Rappaport 1990; Robinson et al. 1991). Met name de invloed van de industrie bij de vaststelling van TLV-waarden zou geleid hebben tot te hoge waarden.

Gezien de centrale betekenis van MAC-waarden bij het voorkómen van gezondheidsschade bij werknemers is het van belang dat deze waarden valide zijn. Indien de huidige gehanteerde MAC-waarden onvoldoende betrouwbaar of niet goed onderbouwd zijn, is herziening door inbrengen in de Nederlandse drietrapsprocedure nodig.

3 Methode voor validering van bestaande MAC-waarden

De validering van de MAC-waarden die in het project zijn betrokken is als volgt uitgevoerd:

Er is een samenvattend toxiciteitsprofiel gemaakt van de stof (zie bijlage 4). Als basis hiervoor zijn de onderbouwingen van de ACGIH (ACGIH, 1989) gebruikt. Als er criteria-documenten beschikbaar waren van andere, met name Europese (overheids)instanties die zich bezighouden met het vaststellen van grenswaarden voor de werkplek, zijn deze eveneens verwerkt in het toxiciteitsprofiel. Zo zijn documenten van de volgende instanties betrokken:

- Scandinavië: Swedish Criteria Group (SCG), Nordic Expert Group (NEG).
- Duitsland: Deutsche Forschungsgemeinschaft (DFG) (Kommission zur Prüfung Gesundheitsschädlicher Arbeitsstoffe (KPGA).
- Engeland: Health and Safety Executive (HSE).
- Verenigde Staten: National Institute for Occupational Safety and Health (NIOSH), TLV commissie van de ACGIH.

Indien nodig is orale blootstelling omgerekend naar inhalatoire blootstelling (bijlage 3).

Drie toxicologen hebben de samenvattende documenten onafhankelijk van elkaar beoordeeld en op basis hiervan voor elke stof een "persoonlijke" gezondheidkundige advieswaarde (GAW) afgeleid. De wijze waarop de GAWs zijn vastgesteld is vergelijkbaar met de wijze waarop dit binnen de Commissie

Werkgroep van Deskundigen van de Gezondheidsraad gangbaar is. In onderling overleg zijn de uitkomsten vergeleken en bediscussieerd tot consensus is bereikt. De aldus verkregen GAW is vergeleken met de actuele MAC-waarde. Het quotiënt MAC/GAW geeft een indruk van de mate waarin de actuele MAC-waarde afwijkt van de door de deskundigen afgeleide GAW.

4 Selectie van stoffen

Niet voor alle 653 stoffen (of groepen van stoffen) zijn toxiciteitsprofielen gemaakt. Uitgezonderd zijn de volgende groepen van stoffen (tussen haakjes zijn de aantallen vermeld).

- Stoffen die reeds een wettelijke grenswaarde en/of een Europese grenswaarde hebben (105).
- Stoffen die momenteel de drietrapsprocedure doorlopen (ruim 100).
- Stoffen die voorkomen op de lijst van kankerverwekkende stoffen (deze volgen een afwijkende getalsmatige manier van vaststellen van grenswaarden) (36). Een aantal hiervan heeft reeds een wettelijke grenswaarde of doorloopt momenteel de drietrapsprocedure.
- Asphyxiantia. Dit zijn "inerte" gassen die zelf "niet toxisch" zijn, maar zuurstofverdringende eigenschappen hebben. Deze stoffen hebben geen MAC-waarde (11).
- Stoffen die een SEG-advieswaarde hebben dan wel bij de SEG in behandeling zijn (ca. 59).
- Stoffen met een onderbouwing van de DFG of de NIOSH waarvan de MAC-waarde lager is dan de Maximale Arbeitsplatz Konzentration (MAK) (DFG) of Recommended Exposure Limit (REL) (NIOSH) (ca. 57). In de totstandkoming van de MAK en de REL heeft namelijk de sociaal-economische haalbaarheid geen rol gespeeld (in tegenstelling tot de situatie bij verschillende andere buitenlandse grenswaarden). Zowel de MAK als de REL zijn puur gebaseerd op een (deugdelijke) onderliggende toxicologische onderbouwing.

Voor die stoffen waarvan de huidige MAC-waarde hoger is dan de MAK of de REL, is wel een toxiciteitsprofiel gemaakt.

- Stoffen die momenteel in bewerking zijn bij de NEG, SCG of HSE (ca. 31). Sinds enkele jaren is een goede internationale samenwerking op gang gekomen met deze organisaties op het gebied van het schrijven van toxicologisch criteriadocumenten voor gezondheidkundige advieswaarden voor stoffen. Indien een van deze buitenlandse onderbouwingen aanleiding geeft tot verlaging van een grenswaarde in het betreffende land, kan Nederland deze verlaagde waarde overnemen, al dan niet na bestudering van het onderliggende document. Dit betekent

dat veel dubbel werk voorkómen kan worden.

Na uitzondering van bovenstaande groepen blijven 280 stoffen (of groepen van stoffen) over.

5 Resultaten

De hoeveelheid beschikbare informatie per stof varieerde van nihil tot een uitgebreide set gegevens betreffende toxicokinetiek, dierexperimenteel onderzoek en observaties bij de mens.

5.1 Indeling in vier categorieën

Bij beoordeling van alle 280 stoffen ontstonden vier verschillende categorieën stoffen:

- 1 Stoffen met aanwijzingen voor genotoxische carcinogeniteit. Voor deze stoffen zullen in een apart traject zogenaamde korte evaluaties opgesteld worden om te beoordelen of ze voldoen aan de EU-criteria voor carcinogeniteit.
Deze categorie bevat 12 stoffen (Tabel 1, alfabetisch gerangschikt).
- 2 Stoffen waarvoor de huidige MAC-waarde voldoende valide lijkt te zijn: Het quotiënt MAC/GAW is relatief klein. Voor deze stoffen bestaat vooralsnog geen aanleiding de MAC-waarde te herzien.
Deze categorie bevat 53 stoffen (Tabel 2, alfabetisch gerangschikt).
- 3 Stoffen waarvoor de huidige MAC-waarde niet voldoende valide lijkt te zijn: Het quotiënt MAC/GAW is relatief groot. Deze stoffen komen in aanmerking voor herziening van de huidige MAC-waarde op basis van nader literatuuronderzoek.
Deze categorie bevat 109 stoffen (Tabel 3, gerangschikt op basis van rangorde van het risicoquotiënt; zie paragraaf 5.2)
- 4 Stoffen waarvoor in de geraadpleegde onderbouwende literatuur te weinig gegevens te vinden zijn om een GAW op te baseren. Zodoende kan geen oordeel over de validiteit gegeven worden.

Deze categorie bevat 106 stoffen (Tabel 4, alfabetisch gerangschikt). Voor negen van deze stoffen blijkt helemaal geen onderbouwing beschikbaar. Gedeeltelijk (vier stoffen) betreft het "hinderlijk stof" (nuisance dust) waarvoor een algemene stofnorm geldt, zowel in de TLV-lijst als in de Nederlandse MAC-lijst.

5.2 Toekennen van rangnummers in categorie 3

De stoffen waarvoor de huidige MAC-waarde niet voldoende valide lijkt (Tabel 3) geven het meeste houvast voor het opstellen van een prioriteitenlijst op basis van gezondheidkundige overwegingen. Om deze stoffen te kunnen ordenen is aan elke stof een rangnummer (Rang-Q) toegekend. De stoffen zijn in eerste instantie gerangschikt in volgorde van grootte van het risicoquotiënt. Vervolgens heeft de stof met het grootste quotiënt rangnummer 1 gekregen. De stof met het op één na grootste quotiënt rangnummer 2 etcetera. Stoffen met eenzelfde risicoquotiënt kregen hetzelfde rangnummer. In Tabel 3 zijn de stoffen gerangschikt op rangnummer.

6 Discussie

Er wordt met nadruk op gewezen dat de in dit kader vastgestelde GAWs en de daarmee berekende quotiënten slechts hebben gediend als instrumenten bij het opstellen van een prioriteitenlijst op basis van toxicologische gegevens. Zoals gezegd is de beoordeling uitgevoerd op de wijze zoals die binnen de WGD gebruikelijk is, maar het karakter van de beoordeling was dat van een snelle screening, uitgaande van de meestal (zeer) beknopte gegevens in de beschikbare grenswaardendocumentatie, zonder de oorspronkelijke onderliggende literatuur te raadplegen. De quotiënten worden in dit rapport niet vermeld. Hiermee wordt voorkomen dat zij buiten de context van het onderhavige rapport worden gebruikt (een "eigen leven" gaan leiden) en daardoor mogelijk de status krijgen van afdoende gezondheidkundig onderbouwde limiet.

De stoffen waarvoor geen GAW kan worden vastgesteld (Tabel 4) vormen vooralsnog een probleem, omdat niet kan worden ingeschat of de actuele MAC-waarde verantwoord is. Op basis van blootstellingsgegevens kunnen deze stoffen een plaats krijgen op de prioriteitenlijst.

Literatuur

- American Conference of Governmental Industrial Hygienists (1989, reviewed) Documentation of the Threshold Limit Value and Biological Exposure Indices. 1986 ed. Inc. Cincinnati, Ohio .
- American Conference of Governmental Industrial Hygienists: Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. 1991-1992 edition. Cincinnati (USA).
- Castleman BI, Ziem GE (1988) Corporate influence on Threshold Limit Values. American Journal of Industrial Medicine 13:531-59.
- De Nationale MAC-lijst 1994. Publikatieblad 145. Den Haag.
- Deutsche Forschungsgemeinschaft: MAK- und BAT-Werte-Liste 1992. Verlag Chemie Weinheim (Duitsland).
- Deutsche Forschungsgemeinschaft: Gesundheitsschädliche Arbeitsstoffe. Toxikologische-arbeitsmedizinische Begründung von MAK-Werten. Verlag Chemie Weinheim.
- Graensevaerdier for stoffer og materialer, 1992. Arbejdsstilsynet Kobenhavn (Denemarken).
- Health and Safety Executive: Occupational Exposure Limits: Criteria Document Summaries. 1992 edition.
- Health and Safety Executive: EH 40/92 Occupational Exposure Limits, 1992. London (United Kingdom).
- Hygienska Gränsvärden AFS 1990:13. Stockholm (Zweden).
- Nordic Expert Group: Several documents published in: Arbete och Hälsa, vetenskaplig skriftserie of the Arbets Miljö Institutet, Sweden.
- NIOSH: Criteria for a recommended standard. Occupational exposure to..(stofnaam).. U.S. Department of health, education and welfare, Washington D.C.
- Roach SA, Rappaport SM (1990) But they are not thresholds: a critical analysis of the documentation of Threshold Limit Values. American Journal of Industrial Medicine 17:727-53.
- Robinson JC, Paxman DG, Rappaport SM (1991) Implications of OSHA's reliance on TLVs in developing the Air Contaminants Standard. American Journal of Industrial Medicine 19:3-13.
- Swedish Criteria Group for Occupational Standards: Several consensus reports published in: Arbete och Hälsa, vetenskaplig skriftserie of the Arbets Miljö Institutet, Sweden.

Tabellen

- | | |
|---------|--|
| Tabel 1 | Stoffen met aanwijzingen voor genotoxische carcinogeniteit. |
| Tabel 2 | Stoffen waarvoor geldt dat er geen aanleiding bestaat de MAC-waarde te herzien (het risicoquotiënt is relatief klein). |
| Tabel 3 | Stoffen waarvoor geldt dat herziening van de de MAC-waarde wenselijk is (het risicoquotiënt is relatief groot). |
| Tabel 4 | Stoffen zonder risicoquotiënt (te weinig gegevens). |

Tabel 1. Stoffen met aanwijzingen voor genotoxische carcinogeniteit.

Casno.	Stofnaam
7572-29-4	Dichlooracetyleen
121-69-7	Dimethylaniline (N,N-)
122-60-1	Fenylglycidylether
7440-48-4	Kcbalt (stof en rook)
60-34-4	Monomethylhydrazine
100-00-5	Nitrochlorbenzeen (p-)
7440-16-6	Rhodium (damp en stof)
x	Rhodium in water oplosbaar
409-21-2	Siliciumcarbide
509-14-8	Tetranitromethaan
7722-84-1	Waterstofperoxide 90%
1300-73-8	Xylidine

Tabel 2. Stoffen waarvoor geen aanleiding bestaat de MAC-waarde te herzien (het risicoquotient is relatief klein).

Casno.	Stofnaam
3825-26-1	Ammoniumperfluorooctanoaat
7773-06-0	Ammoniumsulfamaat
7440-39-3	Barium en oplosbare verbindingen
10294-33-4	Boriumtribromide
314-40-9	Bromacil
7789-30-2	Broompentafluoride
1563-66-2	Carbofuraan
299-86-5	CrufomaatR
50-29-3	DDT
75-61-6	Dibroomdifluormethaan
102-81-8	Dibutylaminoethanol (2-N-)
78-87-5	Dichloorpropaan (1,2-)
108-20-3	Diisopropylether
148-01-6	Dinitro-o-toluamide (3,5-)
85-00-7	Diquat
136-78-7	Disul
330-54-1	Diuron
944-22-9	Dyfonate
115-29-7	Endosulfan
72-20-8	Endrin
563-12-2	Ethion
16219-75-3	Ethylideennorborneen
22224-92-6	Fenamifos
299-84-3	Fenchloorfos
115-90-2	Fensulfothion
14484-64-1	Ferbam
7723-14-0	Fosfor (geel)
7440-58-6	Hafnium
7580-67-8	Lithiumhydride
16752-77-5	Methomyl
126-98-7	Methylacrylnitril
12108-13-3	Methylcyclopentadienylmangaantricarbonyl
624-83-9	Methylisocyanaat
298-00-0	Methylparathion
21087-64-9	Metribuzine
86-88-4	Naftylthioureum (alpha-)
62-74-8	Natriumfluoracetaat
7681-57-4	Natriummatabisulfiet
98-95-3	Nitrobenzeen
108-03-2	Nitropropaan (1-)
56-38-2	Parathion
87-86-5	Pentachloorfenol
1918-02-1	Picloram
35400-43-2	Sulprofos
78-00-2	Tetraethyllood
75-74-1	Tetramethyllood
108-44-1	Toluidine (m-)
8001-35-2	Toxafeen
13121-70-5	Tricyclohexyltinhydroxide
115-86-6	Trifenylfosfaat
121-45-9	Trimethylfosfiet
78-30-8	Triorthocresylfosfaat
7440-33-7	Wolfram en -verbindingen (in water oplosbaar)

Tabel 3. Stoffen waarvoor herziening van de MAC-waarde wenselijk is (het risicoquotient is relatief groot).

Casno.	Stofnaam	Rang Q
76-44-8	Heptachloor	1
76-22-2	Kamfer (synthetisch)	2
137-26-8	Tetramethylthiuramdisulfide	3
64-18-6	Mierezuur	4
598-56-1	Dimethylethylamine	5
83-79-4	Rotenon	6
1321-65-9	Trichloornaftaleen	7
626-17-5	Ftalodinitril (m-)	8
13463-67-7	Titaandioxide	8
106-49-0	Toluidine (p-)	9
1310-73-2	Natriumhydroxide	10
74-99-7	Methylacetyleen	11
2426-08-6	Butylglycidylether (n-)	12
7637-07-2	Boriumtrifluoride	13
111-42-2	Diethanolamine	14
7440-50-8	Koper (stof)	14
55-63-0	Nitroglycerine	14
95-13-6	Indeen	15
x	Olienevel	16
25639-42-3	Methylcyclohexanol	17
7784-42-1	Arseenwaterstof	18
110-83-8	Cyclohexeen	18
8065-48-3	Demeton	18
25154-54-5	Dinitrobenzeen (alle isomeren)	18
7440-50-8	Koper (rook)	18
141-79-7	Mesityloxyde	19
96-69-5	Thiobis(6-tert-butyl-m-cresol) (4,4'-)	20
1321-64-8	Pentachloornaftaleen	21
108-91-8	Cyclohexylamine	22
628-96-6	Ethyleenglycoldinitraat	22
7783-41-7	Zuurstofdifluoride	23
74-93-1	Methaanthiol	24
77-47-4	Hexachloorcyclopentadien	25
1303-86-2	Boriumoxide	26
2699-79-8	Sulfurylfluoride	26
2039-87-4	Chloorstyreen (o-)	27
26140-60-3	Terfenylen	28
7726-95-6	Broom	29
532-27-4	Chlooracetofenon (alpha-)	29
74-90-8	Cyaanwaterstof	29
19287-45-7	Diboraan	29
141-66-2	Dicrotofos	29
684-16-2	Hexafluoraceton	29
121-82-4	Hexogeen	29
79-24-3	Nitroethaan	29
x	Pyrolyseprodukten van harskern van soldeertin	29
558-13-4	Tetrabroomkoolstof	29
79-27-6	Tetrabroommethaan (1,1,2,2-)	29
479-45-8	Trinitrofenylmethylnitramine (2,4,6-)	29
x	Stearaten (uitz. die van toxische metalen)	30
300-76-5	Dibroom-2,2-dichloorethyldimethylfosfaat(1,2)	31
7439-98-7	Molybdeen, in water oplosbaar	32
10102-43-9	Stikstofmonoxide	32
98-51-1	Butyltolueen (p-tert-)	33
3383-96-8	Temefos	34
64-17-5	Ethanol	35
138-22-7	Butyllactaat (n-)	36
1304-82-1	Bismuthtelluride	37
100-74-3	Ethylmorfoline (N-)	38
7616-94-6	Perchlorylfluoride	39
109-73-9	Butylamine (n-)	40
7790-91-2	Chloortrifluoride	40
999-61-1	Hydroxypropylacrylaat (2-)	40
463-51-4	Ketenen	40
12079-65-1	Mangaancyclopentadienyltricarboxyl	40
7783-54-2	Stikstoftrifluoride	40
627-13-4	Propylnitraat (n-)	41
7440-67-7	Zirconium en -verbindingen	42
638-21-1	Fenylfosfine	43
74-97-5	Broomchloormethaan	44
2698-41-1	Chloorbenzilydeenmalonitril (o-)	44

Tabel 3. Stoffen waarvoor herziening van de MAC-waarde wenselijk is
(het risicoquotient is relatief groot).

Casno.	Stofnaam	Rang Q
78-10-4	Ethylsilicaat	44
x	Methylacetyleen/propadieenmengsel	44
20816-12-0	Osmiumtetraoxide	44
8002-74-2	Paraffinewas (rook)	44
594-72-9	Dichloor-1-nitroethaan (1,1-)	44
111-84-2	Nonaan (n-)	45
92-84-2	Fenothiazine	46
1304-82-1	Bismuthtelluride (Se- doped)	47
460-19-5	Dicyaan	47
6923-22-4	Monocrotophos	47
298-02-2	Foraat	48
8003-34-7	Pyrethrum	49
118-52-5	Dichloor-5,5-dimethylhydantoin (1,3-)	50
109-94-4	Ethylformiaat	50
75-31-0	Isopropylamine	50
1929-82-4	Chloor-6-(trichloor-methyl)pyridine (2-)	51
128-37-0	Di-tert-butyl-p-cresol (2,6-)	51
x	Rubber solvent	52
1303-96-4	Boraten, (tetra)natriumzouten, decahydraat	53
29191-52-4	Anisidine (o- en p-isomeren)	54
123-73-9	Crotonaldehyde	54
556-52-5	Epoxy-1-propanol (2,3-)	54
x	Kolenstof	54
583-60-8	Methylcyclohexanon (o-)	54
681-84-5	Methylsilicaat	54
98-83-9	Methylstyreen (alpha-)	54
10025-67-9	Zwavelmonochloride	54
594-42-3	Perchloormethylmercaptan	55
7440-33-7	Wolfram en -verb. (in water onoplosbaar)	56
2971-90-6	Clopidol	57
79-10-7	Acrylzuur	58
64-19-7	Aziijnzuur	58
17804-35-2	Benomyl	58
2921-88-2	Chloorpyrifos	58
506-77-4	Cyanogeenchloride	58
78-34-2	Dioxathion	58
75-08-1	Ethaanthiol	58
108-46-3	Resorcinol	58

Tabel 4. Stoffen zonder risicoquotient (te weinig gegevens).

Casno.	Stofnaam
x	Aluminium alkylverbindingen
x	Aluminium in water oplosbare zouten
x	Aluminium pyro-poeders
504-29-0	Aminopyridine (2-)
12125-02-9	Ammoniumchloride (rook)
7803-52-3	Antimoonwaterstof
108-98-5	Benzeenthioal
1330-43-4	Boraten, (tetra)natriumzouten, anhydride
11130-12-4	Boraten, (tetra)natriumzouten, pentahydraat
106-97-8	Butaan (n-)
109-79-5	Butaanthioal
89-72-5	Butylfenol (o-sec-)
1317-65-3	Ca-carbonaat
471-34-1	Calciumcarbonaat
1305-62-0	Calciumhydroxide
1305-78-8	Calciumoxide
10101-41-4	Calciumsulfaat
120-80-9	Catechol
9004-34-6	Cellulose
21351-79-1	Cesiumhydroxide
600-25-9	Chloor-1-nitropropaan (1-)
55720-99-5	Chloordifenyloxyde
95-49-8	Chloortolueen (o-)
14977-61-8	Chromylchloride
420-04-2	Cyanamide
x	Cyaniden
287-92-3	Cyclopentaan
107-66-4	Dibutylfosfaat
111-40-0	Diethyleentriamine
96-22-0	Diethylketon
x	Difenyl/fenylether-mengsel
108-18-9	Diisopropylamine
109-87-5	Dimethoxymethaan
123-19-3	Dipropylketon
298-04-4	Disyston
108-57-6	Divinylbenzeen (1,3-)
13838-16-9	Enfluraan
12604-58-9	Ferrovanadium (stof)
7782-65-2	Germaniumtetrahydride
1335-87-1	Hexachloornaftaleen
108-84-9	Hexylacetaat (sec-)
13463-40-6	IJzerpentacarbonyl
102-54-5	IJzerzout van dicyclopentadien
x	IJzerzouten (in water oplosbaar)
123-51-3	Isoamylalcohol
110-19-0	Isobutylacetaat
26952-21-6	Isooctylalcohol
768-52-5	Isopropylaniline (N-)
75-47-8	Jodoform
1310-58-3	Kaliumhydroxide
10210-68-1	Kobaltcarbonyl
16842-03-8	Kobalthydrocarbonyl
1344-36-1	Leisteen
x	LPG
546-90-0	Magnesiumcarbonaat
1309-48-4	Magnesiumoxide (rook)
150-76-5	Methoxyfenol (4-)
79-20-9	Methylacetaat
108-87-2	Methylcyclohexaan
8022-00-2	Methyldeeton
1338-23-4	Methylethylketonperoxide
563-80-4	Methylisopropylketon
12001-26-2	Mica
7439-98-7	Molybdeen, in water onoplosbaar
7631-90-5	Natriumbisulfiet
54-11-5	Nicotine
100-01-6	Nitroaniline (p-)
99-08-1	Nitrotolueen (m-)
111-65-9	Octaan (n-)
2234-13-1	Octachloornaftaleen
144-62-7	Oxaalzuur
76-01-7	Pentachloorethaan

Tabel 4. Stoffen zonder risicoquotient (te weinig gegevens).

Casno.	Stofnaam
107-87-9	Pentanon (2-)
8075-36-3	Perliet
83-26-1	Pivalyl-1,3-indandion (2-)
7440-06-4	Platina
107-19-7	Propargylalcohol
1309-37-1	Rouge
57-50-1	Saccharose
7440-21-3	Silicium
7803-62-5	Siliciumtetrahydride
14378-12-2	Speksteen
57-24-9	Strychnine
7440-25-7	Tantalium
13494-80-9	Tellurium en -verbindingen
7783-80-4	Telluriumhexafluoride
1335-88-2	Tetrachloornaftaleen
3333-52-6	Tetramethylsuccinonitril
7440-28-0	Thallium (in water oplosbaar)
7719-09-7	Thionylchloride
18282-10-5	Tinoxide
x	Tinverbindingen (organisch)
126-73-8	Tributylfosfaat
93-76-5	Trichloorfenoxiazijnzuur (2,4,5-)
88-89-1	Trinitrofenol (2,4,6-)
7440-61-1	Uranium en -verbindingen
110-62-3	Valeriaanaldehyde
81-81-2	Warfarin
1477-55-0	Xyleen, alpha, alpha'-diamine (m-)
7440-65-5	Yttrium
x	Yttriumverbindingen
9005-84-9	Zetmeel
7646-85-7	Zinkchloride (rook)
557-05-1	Zinkstearaat
5714-22-7	Zwavelpentafluoride
7783-60-0	Zwaveltetrafluoride

Bijlagen

- Bijlage 1 Lijst van afkortingen.
- Bijlage 2 De Nederlandse procedure voor het vaststellen van wettelijke grenswaarden (drietraps-procedure).
- Bijlage 3 Omrekening van orale naar inhalatoire blootstelling.
- Bijlage 4 Toxiciteitsprofielen van de 280 geselecteerde stoffen (aparte bijlage).

BIJLAGE 1

Lijst van afkortingen

ACGIH: American Conference of Governmental Industrial Hygienists

DFG: Deutsche Forschungsgemeinschaft

GAW: gezondheidskundige advieswaarde

GR: Gezondheidsraad

HBROEL: Health-Based Recommended Occupational Exposure Limit

HSE: Health and Safety Executive

KPGA: Kommission zur Prüfung Gesundheitsschädlicher Arbeitsstoffe

MAC: Maximaal Aanvaarde Concentratie

MAK: Maximale Arbeitsplatz Konzentration

NEG: Nordic Expert Group

NIOSH: National Institute for Occupational Safety and Health

NOAEL: No Observed Adverse Effect Level

REL: Recommended Exposure Limit

SCG: Swedish Criteria Group

SEG: Scientific Expert Group (van de Europese Commissie)

SER: Sociaal Economische Raad

SZW: Ministerie van Sociale Zaken en Werkgelegenheid

TLV: Threshold Limit Value

WGD: Commissie Werkgroep van Deskundigen (van de GR)

BIJLAGE 2

De Nederlandse procedure voor het vaststellen van wettelijke grenswaarden (drietrapsprocedure).

1.

De Commissie WGD, een commissie van de GR, stelt op basis van een uitgebreid literatuuronderzoek een engstalig rapport met een Nederlandse samenvatting op dat (indien mogelijk) wordt afgesloten met een HBROEL (= GAW). Het essentiële kenmerk van de HBROEL is dat deze is gebaseerd op louter gezondheidkundige aspecten.

Het werkprogramma van de Commissie WGD wordt vastgesteld door het Ministerie van SZW, in overleg met de Subcommissie MAC-waarden van de SER en de Commissie WGD. Informatie over een stof wordt op verzoek van SZW geleverd door adviesvoorbereidende instituten (Coronel Laboratorium Amsterdam, TNO Voeding Zeist, Landbouw Universiteit Wageningen). De informatie wordt in een schriftelijke ronde en een subgroepbijeenkomst becommentarieerd. Na verwerking van het commentaar wordt de stof besproken tijdens één of meer plenaire vergaderingen van de Commissie WGD. Na verwerking van het commentaar van de voltallige Commissie wordt het rapport als Openbaar Concept Rapport (OCR) gepubliceerd. Er volgt dan een termijn van 3 maanden waarin eenieder in de gelegenheid wordt gesteld commentaar te leveren. Na eventuele verwerking van reacties op het OCR wordt door de Commissie WGD het definitieve rapport vastgesteld. De voorzitter van de GR biedt, nadat hij de Beraadsgroep Toxicologie van de GR heeft gehoord, het rapport aan aan de Staatssecretaris van SZW. Tegelijkertijd gaat het rapport naar de Subcommissie MAC-waarden van de SER. De Staatssecretaris vraagt advies aan de SER met betrekking tot een in te voeren wettelijke grenswaarde.

2.

In de Subcommissie MAC-waarden zijn werknemersorganisaties, werkgeversorganisaties en overheid vertegenwoordigd. De Subcommissie toetst de haalbaarheid van de advieswaarde van de GR. Uiteindelijk mondt dit uit in een advies inzake een te hanteren wettelijke grenswaarde of andere grenswaarde. Dit (openbare) advies wordt aangeboden aan de Staatssecretaris van Sociale Zaken en Werkgelegenheid.

3.

De Staatssecretaris van Sociale Zaken en Werkgelegenheid stelt tenslotte de wettelijke grenswaarde of andere grenswaarde vast, waarna deze, met datum van ingang, wordt gepubliceerd. De wettelijke grenswaarden worden opgenomen in de bijlage bij de Regeling wettelijke grenswaarden, die twee maal per jaar wordt herzien (en gepubliceerd in de Staatscourant).

BIJLAGE 3

Omrekening van orale naar inhalatoire blootstelling.

Rat

Ademminuutvolume van de rat: 125 ml/min.

Dit is in 8 uur (werkdag): $8 \times 60 \times 125 = 60 \text{ liter} = 0,06 \text{ m}^3$.

Stel: NOAEL (oraal) = $y \text{ mg/kg rat/dag}$.

Dit is $y \times 200/1000 = y/5 \text{ mg/rat/dag}$ (lichaamsgewicht rat is 200 gram).

Expositie via de lucht: $y/5$ gedeeld door $0,06 = y/0,03 = 3,3y \text{ mg/m}^3 = \text{NOAEL}$.

Uitgaande van blootstelling gedurende 5 dagen/week, i.p.v. 7 dagen/week:

$\text{NOAEL} = 7/5 \times 3,3y = \mathbf{4,6y \text{ mg/m}^3}$.

Dit voorbeeld geldt voor de rat. Op analoge wijze is omgerekend voor de muis, hond, konijn en aap, waarbij rekening is gehouden met de species-specifieke gegevens voor lichaamsgewicht en ademminuutvolume.

BIJLAGE 4

De toxiciteitsprofielen van de 280 geselecteerde stoffen zijn opgenomen in een aparte bijlage.

TNO-rapport V 95.228

BIJLAGE 4 Toxiciteitsprofielen van de 280 geselecteerde stoffen.

Deze bijlage hoort bij: Evaluatie basisnormering chemische belasting op de werkplek.

Deel 1: Prioritering van stoffen voor het vaststellen van wettelijke grenswaarden op basis van gezondheidkundige overwegingen.

Auteurs:

Prof. Dr. V.J. Feron
Drs. L.C.M.P. Hontelez
Dr. P.C. Noordam
Drs. M.V.W. Wijnands
Dr. R.A. Woutersen

In opdracht van:

Ministerie van Sociale Zaken en Werkgelegenheid
Directoraat-Generaal van de Arbeid
Den Haag

Projectnummer:

354695

Datum:

September 1995

Alle rechten voorbehouden.

Niets uit deze uitgave mag worden
vermenigvuldigd en/of openbaar gemaakt
door middel van druk, fotokopie, microfilm
of op welke andere wijze dan ook, zonder
voorafgaande toestemming van TNO.

Indien dit rapport in opdracht werd
uitgebracht, wordt voor de rechten en
verplichtingen van opdrachtgever en
opdrachtnemer verwezen naar de
'Algemene Voorwaarden voor Onderzoeks-
opdrachten TNO', dan wel de betreffende
terzake tussen partijen gesloten
overeenkomst.

Het ter inzage geven van het TNO-rapport
aan direct belanghebbenden is toegestaan.

© TNO

Casnr: 79-10-7 Stofnaam: Acrylzuur
 Synoniemen: 2-Propeenzuur, Etheencarbonzuur, Ethyleencarbonzuur, Vinylmierzuur

tggr			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	2	5,9			Ned:		
USA 1992:	2	5,9			USA: Ja		
UK 1992:	10	30	20	60	UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	10	30			Den:		
Zwed 1990:	10	30	15	45	Zwed:		Zwed:

1: PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 14 °C

BOILING POINT: 141 °C

VAPOR PRESSURE: 3.2 mm Hg (at 20 °C)

2: TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorption by skin, inhalation and ingestion. Inhaled acrylic acid is dissolved in the mucus of the upper respiratory tract, transported (mucociliarly) and ingested. After resorption the highest concentrations are found in the liver, kidneys and fat (ACGIH).

BIOTRANSFORMATION: The compound is rapidly metabolized into esters, which are metabolized into mercaptic acids (ACGIH).

ELIMINATION: Via expiration or via the renal tract (ACGIH).

3: ANIMAL EXPERIMENTS:

3.1: IRRITATION (SK/MM/EY/RESP): After inhalatory exposure irritation of the mucous membranes occur. Application in the eyes of a 1% solution resulted in severe irritation and corneal burns.

SENSITIZATION: (SK/RESP): Guinea pig maximization test was positive; "a definite skin sensitizer". Draize test was negative (ACGIH); DFG considers it a non-sensitizing compound for guinea pigs.

3.2: INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rat, four hour exp.) = 3600 - > 5100 mgm3 (DFG). Toxic signs are dyspnea.

SHORT TERM TOX: NAEL in rats (6 h/d; 5 d/w; 4 weeks) = 80 ppm (ACGIH) or (6 h/d; 5 d/w; 13 weeks) = 25 ppm. MAEL in the last study in mice was 5 ppm, the effect was histopathological changes in the olfactory epithelium. Higher exposure levels (25 - 75 ppm) resulted in reduced body weight and reduced hemoglobin level. Very high exposures (1500 ppm) for shorter periods resulted in damage in liver, kidneys, lungs, eyes, skin and increased reticulocyte counts (ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3: ORAL:

ACUTE TOX: LD50 (rat) = 193 - 3200 mg/kg. Toxic signs are unspecific.

SHORT TERM TOX: NOEL and LOEL in rats (three months, in drinking water) = respectively 83 and 250 mg/kg bw (= omgerekend 382 and 1150 mg/m3). Higher concentrations reduced water intake. This may interfere with the observed adverse effects.

LONG TERM TOX:

CARCINOGENICITY: One dermal application test did not result in tumors in the skin or subcutis in male mice. From another dermal test it was concluded that the compound was acting as a weak but complete carcinogen after initiation with DMBA (ACGIH).

REPRODUCTION TOX: Administration via the drinking water at a level of 750 mg/kg bw (= omgerekend 3450 mg/m3) caused a lowered viability of the offspring of rats, with a decreased birth -; liver-; kidney- and heart weight. Teratogenic and embryotoxic properties were found after ip administration (No NOEL established) (ACGIH).

OTHER STUDIES: After ip administration, toxic signs include convulsions.

3.4: DERMAL: LD50 (rabbit) = 295 - 950 mg/kg (DFG); 0.67 - 1.3 mg/kg (ACGIH). Toxic signs are unspecific.

4: MUTAGENICITY: Ames tests were negative.

5: OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Acrylic acid (also the vapor) is caustic for the skin, eyes and mucous membranes (DFG).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: "Long term inhalatory tests are obligatory before setting a well underpinned MAK."

ACGIH: "Recent studies suggest lowering the TLV to 2 ppm."

Casnr: x Stofnaam: Aluminium alkylverbindingen
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	2			Ned:	Nee	
USA	1992:	-	2			USA:		
UK	1992:	-	2			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	2			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

Trialkylaluminium compounds are liquids at room temperature.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP)

SENSITIZATION (SK/RESP)

3.2:INHALATION:

ACUTE TOX (LOC/SYS):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/RESP/MM/EY):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM EXP:

LONG TERM EXP:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Geen toxiciteitsgegevens over Alalkylverbindingen bekend. TLV is gebaseerd op de aanname dat de niet-gehalogeneerde verbindingen decomposeren in Aluminiumoxide-rook en dat de gehalogeneerde verbindingen de irritatie van deze rook verhogen, door "halogen acid hydrolyse". "Dus" wordt er een lagere TLV voorgesteld dan die voor Al-las-gassen.

Casnr: x Stofnaam: Aluminium in water oplosbare zouten
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2			Ned:		
USA	1992:	-	2			USA:		
UK	1992:	-	2			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	2			Den:		
Zwed	1990:	-	2			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP)
SENSITIZATION (SK/RESP)

3.2:INHALATION:

ACUTE TOX (LOC/SYS):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/RESP/MM/EY):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM EXP:

LONG TERM EXP:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: De TLV is gebaseerd op de hoeveelheid gehydrolyseerd zuur en de daarvoor geldende TLV. De toxiciteit van AL wordt geacht veel lager te zijn dan die van de bijbehorende zuren.

Casnr: x Stofnaam: Aluminium pyro-poeders
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	5			Ned:	Nee	
USA	1992:	-	5			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP)
SENSITIZATION (SK/RESP)

3.2:INHALATION:
ACUTE TOX (LOC/SYS):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/RESP/MM/EY):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM EXP:
LONG TERM EXP:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op gegevens (Patty's?) dat Aluminium pyro-poeders toxischer zijn dan Al metaal-stof. De vastgestelde grens wordt geacht te beschermen tegen longveranderingen.

Casnr: 504-29-0 Stofnaam: Aminopyridine (2-)
Synoniemen: 2-Pyridilamine

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,5	2			Ned:		
USA	1992:	0.5	1.9			USA:		
UK	1992:	0.5	2	2	8	UK:		UK:
BRD	1992:	0,5	2			BRD:		BRD:
Den	1992:	0,5	2			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 58.1 °C
BOILING POINT: 210.6 °C
VAPOR PRESSURE: "low"

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION/BIOLOGICAL HALF-LIFE:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP)
SENSITIZATION (SK/RESP)

3.2:INHALATION:

ACUTE TOX (LOC/SYS):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 rat: 200 mg/kg, LD50 muis: 50 mg/kg (omgerekende LC50 = resp. 1400 en 350 mg/m3). LD50 muis ip, sc en iv = resp. 25-50, 70 en 23mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/RESP/MM/EY):

SENSITIZATION (SK/RESP):

ACUTE TOX: Een fatale intoxicatie is bekend. Vermoedelijk door inhalatie en huidabsorptie. Geen gegevens over hoogte van blootstelling (1951).

SHORT TERM EXP: Vijf uur blootstelling aan ongeveer 5 ppm resulteerde in hoofdpijn, misselijkheid en verhoogde bloeddruk (1950).

LONG TERM EXP:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de humane gegevens.

Casnr: 12125-02-9 Stofnaam: Ammoniumchloride (rook)
Synoniemen:

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	tatie	geen	serend
Ned	1994:	-	10		Ned:	Nee	
USA	1992:		10	20	USA:		
UK	1992:		10	20	UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992:		10		Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: sublimes at 350 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP)
SENSITIZATION (SK/RESP)

3.2:INHALATION:

ACUTE TOX (LOC/SYS):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 rat im: 30 mg/kg. (Omgerekende LC50 humaan = 210 mg/m3)

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/RESP/MM/EY): milde irritatie van de huid en de ademhalings-
wegen bij onbekende blootstelling.

SENSITIZATION (SK/RESP):

ACUTE TOX: Lage systemische toxiciteit na ingestie (onbekende dosis).

SHORT TERM EXP:

LONG TERM EXP:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV wordt niet gemotiveerd. NH4Cl
wordt niet beschouwd als een "serious industrial hazard".

Casnr: 3825-26-1 Stofnaam: Ammoniumperfluorooctanoaat
Synoniemen: Octanoic acid, Pentadecafluorammonium zout, FC143

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:	Nee	
USA	1992:	-	0.1			USA:	Nee	
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
Sublimes above 125 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:42 dagen na laatste blootstelling waren er lage, maar nog detecteerbare bloedspiegels. In vrouwelijke ratten wordt de stof sneller uitgescheiden dan in mannelijke ratten.

3:ANIMAL EXPERIMENTS: Lever is primair target orgaan.

3.1:IRRITATION (SK/MM/EY/RESP): Huid: niet irriterend. Oog: matige irritatie die 7 dagen duurde.

SENSITIZATION (SK/RESP)

3.2:INHALATION:

ACUTE TOX (LOC/SYS): 4 uur, vanaf 800 mg/m3 veroorzaakte sterfte bij ratten.

SHORT TERM TOX: Herhaalde blootstelling van ratten aan 7,6 en 84 mg/m3 veroorzaakte reversibele leverschade en een verlengde retentie van FC-143 in het bloed. Blootstelling aan 1 mg/m3 gaf geen effecten.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Tot 25 mg/m3 werden er geen teratogene effecten gevonden bij ratten.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 rat: 540 mg/kg.

SHORT TERM TOX: 28 dagen, ratten: vanaf 1000 ppm trad groeivertraging op. Eerste levergewicht-toename (en histologische veranderingen) traden op bij 30 en 300 ppm, resp bij mannelijke en vrouwelijke ratten. "NEL" was resp. 10 en 100 ppm. (omgerekend: NEL = resp. 3,5 en 35 mg/m3).

28 dagen muizen: 30 ppm gaf levergewicht-toename (=omgerekend 21 mg/m3).

Apen, 90 dagen: tot 10 mg/kg/dag veroorzaakte geen effecten (omgerekende NEL = 70 mg/m3). Hogere doseringen (30 en 100 mg/kg/dag) veroorzaakten veranderingen in het maagdarmkanaal, het reticulo-endotheliale systeem en sterfte.

LONG TERM TOX: 2 jaar, ratten: 30 en 300 ppm (= omgerekend 10,5 en 105 mg/m3) per dag veroorzaakte een dosis-afhankelijke groeivertraging. Belangrijkste

pathologische veranderingen bevonden zich in de lever. Op verschillende tijdstippen tijdens de proef traden er afwijkingen op in het rode bloedbeeld.

CARCINOGENICITY: (2 jaar, 30 en 300 ppm; omgerekend 10,5 en 105 mg/m3): Er werd geen hogere tumorincidentie gevonden.

REPRODUCTION TOX: Tot 100 mg/kg/dag (= omgerekend 700 mg/m3) werden er geen teratogene effecten gevonden in ratten.

OTHER STUDIES:

3.4:DERMAL: 20-2000 mg/kg herhaalde toediening, veroorzaakte leverschade (dosis-afhankelijk) en gaf een verhoogde bloed-organisch-fluoride-spiegel. Hoge doses (ongespecificeerd) veroorzaakte sterfte.

4:MUTAGENICITY: Ames-testen en gist- (Saccharomyces-) testen waren negatief (met en zonder S-9 mix). C3H 10T1/2 colony cell line transformation assay was negatief.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/RESP/MM/EY):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM EXP:

LONG TERM EXP:

EPIDEMIOLOGICAL STUDIES: Hogere bloedwaarden werden gevonden in blootgestelde werknemers (<0,03 - 7,6 mg/m3), vergeleken met niet-blootgestelden. Hier gingen geen ziekteverschijnselen mee gepaard.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV werd vastgesteld op basis van de beschreven toxicologische gegevens.

Casnr: 7773-06-0 Stofnaam: Ammoniumsulfamaat
Synoniemen: Ammate, Amicide, AMS

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:	-	15			BRD:		BRD:
Den	1992:	-	10			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 130 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 20-50% oplossingen veroorzaakten bij ratten, geen irritatie, noch toxische verschijnselen, ook niet na herhaalde toedieningen.
SENSITIZATION (SK/RESP)

3.2:INHALATION:
ACUTE TOX (LOC/SYS):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 van ratten, muizen en kwartels is resp. 3900, 5760 en 3000 mg/kg.
SHORT TERM TOX: Herhaalde toedieningen van 20.000 ppm/kg (?) veroorzaakten geen verschijnselen.
LONG TERM TOX: 105 dagen, 10.000 ppm (1%) in het voer van ratten gaf geen afwijkingen. 2% Gaf groeivertraging maar geen histologische afwijkingen. (omgerekende NEL = 3500 mg/m3)
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/RESP/MM/EY):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM EXP:
LONG TERM EXP:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de lage acute-, chronische- en huidtoxiciteit bij proefdieren. De hoogte van de TLV zelf, komt uit de lucht vallen, naar mijn idee.

Casnr: 29191-52-4 Stofnaam: Anisidine (o- en p-isomeren)
Synoniemen: Methoxyaniline (2- of 4-); Aminoanisoole

	tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,1	0,5			Ned: Ja		
USA 1992:	0.1	0.5			USA: Ja		
UK 1992:	0.1	0.5			UK: Ja		UK:
BRD 1992:	0,1	0,5	0,2	1,0	BRD: Ja		BRD:
Den 1992:	0,1	0,5			Den: Ja		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 5 °C.

BOILING POINT: 225 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: 1 maand, 2 uur per dag, 6 dagen per week, 10-30 mg/m3 bij muizen: verminderde prikkelbaarheid van zenuwen.

LONG TERM TOX: 12 maanden, 2 u/dag, 6 d/wk, 10-30 mg/m3 bij muizen: anemie, reticulocytosis, en verschijnselen van chronische intoxicatie ontstonden.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: 6 maanden; 3,5 u/d; 1,9 mg/m3: geen anemie noch andere verschijnselen van chronische intoxicatie. Wel enkele klachten van hoofdpijn en duizeligheid, toename van sulfhemoglobine en methemoglobine en aanwezigheid van Heinz bodies.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de "directe correlatie van minimale toxische effecten met gemeten luchtconcentraties".

Casnr: 7803-52-3 Stofnaam: Antimoonwaterstof
Synoniemen: Stibine

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,1	0,5			Ned:		
USA 1992:	0.1	0.51			USA:		
UK 1992:	0.1	0.5	0.3	1.5	UK:		UK:
BRD 1992:	0,1	0,5	0,5	2,5	BRD:		BRD:
Den 1992:	0,05	0,25			Den:		
Zwed 1990:	0,05	0,3			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -88 °C.
BOILING POINT: -17 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): irriterend voor de longen.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): 20 min, 100 ppm, is binnen enkele dagen dodelijk voor muizen. Blootstelling van honden en katten gedurende een uur, (concentratie?) was gevaarlijk en leidde binnen 24 uur tot sterfte tgv van pulmonaire congestie en oedeem. Cavia's, blootgesteld aan 65 ppm, gedurende 1 uur, ontwikkelden hemoglobinurie. Muizen gingen na 7,5u blootstelling aan 30 ppm, dood.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Er bestaat onzekerheid of verschijnselen als hoofdpijn, zwakte, hematurie, buikpijn en misselijkheid toegeschreven konden worden aan Stibine alleen, of dat blootstelling tegelijkertijd aan arseen hiervoor verantwoordelijk was (1944!).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de analogie met het vergelijkbare, hoewel licht-toxischer arseenwaterstof.

Casnr: 7784-42-1 Stofnaam: Arseenwaterstof
Synoniemen: Arsine

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,05	0,2			Ned:		
USA	1992:	0.05	0.16			USA:		
UK	1992:	0.05	0.2			UK:		UK:
BRD	1992:	0,05	0,2	0,25	1,0	BRD:		BRD:
Den	1992:	0,01	0,03			Den:		
Zwed	1990:	0,02	0,05			Zwed:		Zwed:

NIOSH REL (1992): 0.002 mg/m3 Ceiling; potential occupational carcinogen.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -117 °C

BOILING POINT: -62.5 °C

VAPOR PRESSURE: > 740 mm Hg (at 20 °C)

ODOR THRESHOLD: about 1.5 mg/m3

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake via the lungs by passive diffusion.

BIOTRANSFORMATION: It is broken down to trivalent arsenic (NIOSH, SCG) and then biotransformed in the liver by methylation.

ELIMINATION: The primary path of excretion seems to be via the urine (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure at 80 mg/m3 for one hour was lethal for all exposed mice. There was a correlation between the decrease in hematocrit value and exposition level (SCG). Exposure at 10 to 32 mg/m3 can cause poisoning symptoms and 800 mg/m3 for 30 minutes is fatal (ACGIH).

SHORT TERM TOX: Animals exposed 3 h/day at levels between 1.6 and 6.4 mg/m3 arsine, developed blood changes in a few weeks (ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Mean lethal dose in small mammals is 0.5 mg/kg body weight (NIOSH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Toxicological symptoms can already occur after a two hour exposure at 0.055 mg/m3 and include: headache, fatigue, dizziness, shortness of breath, abdominal pain and extensive hemolysis which causes jaundice, hemoglobinuria and (reversible) renal damage (SCG, ACGIH). Other reported toxic exposure levels include 10 -32 mg/m3 for a few hours; and 1.6 mg/m3 (post event measuring) (ACGIH). Lethal doses are reported to be 32 mg/m3 (for longer periods) and 800 mg/m3 (immediate death). Death cause is often acute kidney damage. Effects on heart function and a mild toxic polyneuropathy can occur after surviving acute arsine poisoning (SCG).

SHORT TERM TOX:

LONG TERM TOX: Anemia was reported to be one of the effects of prolonged occupational exposure to low concentrations of arsine (SCG, NIOSH, ACGIH). A secondary risk is the occurrence of inorganic arsenic in the bloodstream resulting from breakdown of arsine (NIOSH).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: The critical effect of exposure to arsenic is its effect on the blood. "It is possible that arsine has the same effects as trivalent arsenic".

ACGIH: TLV "is the same as that of the other inorganic arsenic compounds which are considered substantially less toxic".
NIOSH: The standard setting is not motivated in the NIOSH: Current Intelligence Bulletin 32. 1979 Arsine (Arsenic hydride) poisoning in the workplace.

Casnr: 64-19-7 Stofnaam: Azijnzuur
Synoniemen: Essigszure, Aeddikesyre (Deens)

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 10	25			Ned:		
USA	1992: 10	25	15	37	USA: Nee		
UK	1992: 10	25	15	37	UK:		UK:
BRD	1992: 10	25	20C	50C	BRD:		BRD:
Den	1992: 10	25			Den:		
Zwed	1990: 5	13	10	25	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 16.7 °C

BOILING POINT: 118 °C

VAPOR PRESSURE: 11.5 mm Hg

ODOR THRESHOLD: 1 ppm (inured workers) and 5 ppm (or <10 ppm) for uninured workers (DFG).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorption via the respiratory and digestive tract.

BIOTRANSFORMATION: The acetate ion is a normally occurring metabolite in different physiological processes.

ELIMINATION: About 50% of oral administered acetic acid is excreted as CO2 (SCG, DFG).

3:ANIMAL EXPERIMENTS: The undissociated compound can cause intravascular hemolysis, hemorrhagic diathesis in case of acidosis, and circulation - and kidneyfailure (DFG).

3.1:IRRITATION (SK/MM/EY/RESP): Reversible eye damage occurs after application of 1-5% solutions to the eyes of rabbits and 6-9% sol. to guinea pigs (but also irreversible cornea opalescence in rabbits is reported). The damage becomes irreversible to rabbits when 10% solutions are used (DFG).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (one hour) for mice and guinea pigs = 5620 ppm; levels above 100 ppm were irritating to the respiratory tract. Guinea pigs, exposed (one hour) at 5 and 100 (or higher) ppm showed respectively minor and more pronounced changes in respiration: namely bronchial constriction and a reduced respiration rate (ACGIH, DFG). In the 100 ppm - and lower groups, the changes were reversible within one hour after termination of the exposition (DFG, SCG). Rats could tolerate very high concentrations (12,000 to 35,000 ppm; for 30 minutes) without severe toxic signs, although the upper respiratory tract was irritated. one rat (of six) died after exposure a 16,000 ppm (four hours).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats and mice) = resp. 3.31- 3.51 and 4.96 mg/kg.

SHORT TERM TOX: NEL in rats (9 weeks, via drinking water) = 210 mg/kg (= omgerekend 966 mg/m3); critical effect = reduced food intake and - growth rate (DFG, SCG).

LONG TERM TOX:

CARCINOGENICITY: When applied to the skin, the compound only shows a weak tumor promoting effect and a stimulation of epidermal hyperplasia (SCG).

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (guinea pigs) = > 1 g/kg. Solutions of more than 10% were damaging to the skin of guinea pigs (DFG, SCG).

4:MUTAGENICITY: Acetic acid did not induce mutations or chromosomal recombination in fruit flies (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): The compound is irritating to the skin and mucous membranes, eyes and nose in concentrations of 25 ppm (uninured individuals); 50 ppm could not be tolerated. Inured individuals could tolerate 30 ppm (DFG, SCG). Exposure at 10 ppm (or lower) should not be irritating, although some authors did report conjunctival irritation from concentrations below 10 ppm (ACGIH, DFG).

SENSITIZATION (SK/RESP): A few cases of skin sensitization are described (DFG). ACUTE TOX: Lethal dose is 20 - 50 g, or 60 - 70 ml concentrated acetic acid (DFG).

SHORT TERM TOX:

LONG TERM TOX: Workers, exposed during 7 -12 years at concentrations of 26 to 76 ppm, with peak levels of 200 ppm showed hyperkeratosis of the skin, conjunctivitis, bronchitis, pharyngitis and tooth erosion. In another study (of the same "case"?) only light irritation of the respiratory tract, stomach and skin are mentioned (SCG, DFG, ACGIH). Exposure at 10 ppm for tens of years, did not cause toxicological symptoms of any kind (DFG, SCG).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: MAK-Wert is set at 10 ppm because of the irritating properties of the compound to mucous membranes above this level. The height of the odor threshold protects against overexposure.

SCG: Critical effect is irritation of skin and respiratory passages.

ACGIH states: TLV is set "to prevent undue irritation".

Casnr: 7440-39-3 Stofnaam: Barium en oplosbare verbindingen
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,5			Ned:		
USA	1992:	-	0.5			USA:		
UK	1992:	-	0.5			UK:		UK:
BRD	1992:	-	0,5			BRD:		BRD:
Den	1992:	-	0,5			Den:		
Zwed	1990:	-	0,5			Zwed:		Zwed:

Important compounds are the carbonate, chloride, chromate, fluoride, hydroxide, nitrate, oxide, peroxide and sulfate.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 752 °C (Ba); for soluble compounds: various.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorbed via the mucous membranes of the nose and the lungs, the rate depending on the solubility of the compound. The biological half time for barium sulfate in the lungs is 8 or 9 days. Barium is accumulated in the bones, the submaxillary glands (rat) and the pigmented parties of the eyes.

BIOTRANSFORMATION:

ELIMINATION: 90% of orally or iv administered barium in experimental animals is excreted in the faeces; 75% within three days, another 20% in the first month after administration.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Exposure of rats, guinea pigs, and hamsters to 15 mg barium zirconaat/m3 during 225 days, showed poor weight gain, a chronic interstitial pneumonitis and very little deposition of fibrous tissue (ACGIH). (TLV committee considers zirconium as a slightly toxic metal, and has set a TLV for this compound of 5 mg/m3.)

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 of barium zirconate in rat is 1.98 g/kg.

SHORT TERM TOX:

LONG TERM TOX: Life time administration of barium in drinking water, (5-10 mg Ba2+/l) showed no toxic effects in rats (SCG).

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Rabbits, given injections of 0.75 to 4 ml of a 2% BaCl sol. developed cardiomyopathy and hypokalemia (SCG). Doses of 5 mg/kg (sc) were lethal (ACGIH). Chronic poisoning in rabbits, with death in 98 to 193 days, occurred after injections of 10; 5 and 2 mg/kg, showing effects on the central nervous system.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Barium oxide dust is considered to be an irritant of skin and nasal mucosa (SCG, ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX: Some accidental poisonings are reported (SCG). Symptoms (after oral intake) are vomiting, colic and diarrhea. Barium ions first stimulate and then paralyse the muscles, resulting (in more severe cases) in loss of reflexes and paralysis. These symptoms are considered to be induced by a Ba2+ -induced hypokalemia, since Ba2+ is an antagonist to K+ (SCG). Particularly the cardiac muscle, but also the skeletal, arterial, intestinal and bronchial muscles are affected. Also effects on the hematopoietic system and the cerebral cortex are reported (ACGIH). The lower limit for toxic effects has been reported to be 0.2-0.5 g Ba, and the lethal dose about 3 to 4 g (SCG). Baritosis (opacities in x-rays of the lungs, seemingly not due to tissue damage and possibly without effect on lung function) can occur after inhalation of barium sulfate dust (SCG) or other barium

compounds. "More soluble forms of barium, as the carbonate, oxide and nitrate, tend to be more injurious, particularly acutely" (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: " No dose-response or dose-effect relationships can be given, since the literature contains virtually no data on exposures". And: "it is impossible to determine a critical exposure level, where the critical effect seems to be irritation of the nasal mucosa. In general the more soluble compounds are the more toxic".

ACGIH reported that a limit of 0.5 mg/m³ for barium nitrate has been used for a number of years in a certain laboratory with satisfactory results.

"It is not known what degree of added safety this limit incorporates".

Casnr: 17804-35-2 Stofnaam: Benomyl
 Synoniemen: Methyl-1-(butylcarbamoyle)-2-benzimidazolecarbamaat; Benlate

	tgg	Mg/m3	ppm	STEL	Mg/m3	Huidno-	Carcino-	Sensibili-
	Ppm					tatie	geen	serend
Ned 1994:	0,8	10				Ned:		
USA 1992:	0.84	10				USA:		
UK 1992:	-	10	-	15		UK:		UK:
BRD 1992:						BRD:		BRD:
Den 1992:	-	5				Den:		
Zwed 1990:						Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

Benomyl is a crystalline solid.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: De belangrijkste in de urine aangetroffen metaboliet is methyl-5-hydroxy-2-benzimidazolecarbamaat, aanwezig als glucuronide- en/of sulfide(?) -conjugaat.

ELIMINATION: Na eenmalige toediening bij honden en ratten wordt meer dan 90% binnen 72 uur uitgescheiden met de faeces en de urine. Bij rat en hond treedt er geen accumulatie op in de weefsels (chronische proef).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Een van 10 cavia's ontwikkelde twee dagen na applicatie van een 25% suspensie (25% benomyl als actieve component in een 50% "wetttable powder"), mild erytheem. Lagere concentraties gaven geen irritatie van de huid. Applicatie van 10 mg droog 50% poeder, of 0,1 ml van een 10% suspensie in minerale olie, op het oog, veroorzaakte tijdelijke milde irritatie van de conjunctivae.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 = >2000 mg/m3 (rat) en >825 mg/m3 (hond) bij een expositieduur van 4 uur. NEL rat = >100 en <410 mg/m3; en voor de hond: NEL = >325 en <825 mg/m3, waarbij het kritische effect (histologisch) bestond uit remming van de spermatogenese.

SHORT TERM TOX: Blootstelling gedurende 3 weken aan 100 mg/m3 (4u/dag, 5d/week) veroorzaakte geen klinische of histopathologische aanwijzingen van accumulatie-effecten in de rat.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Critical effect after 4 hour exposition was reduction of the spermatogenic activity.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 = >10.000 mg/kg (rat).

SHORT TERM TOX:

LONG TERM TOX: Twee jaar-proeven: NEL (rat) = (>) 2500 ppm (= omgerekend 875 mg/m3) en NEL (hond) = 500 ppm (= omgerekend 122,5 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX: Drie-generaties rattenproef: geen repr. of lactatie verschillen gevonden (hoogste dosering was 2500 ppm). Teratogeniteitstest (rat): niet teratogeen (hoogste dosering was 500 ppm).

OTHER STUDIES:

3.4:DERMAL: LD50 = >10.000 mg/kg (konijn).

4:MUTAGENICITY: Dominant-letaal test (rat): niet mutageen (hoogste dosering was 2500 ppm).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de lage acute en chronische toxiciteit bij proefdieren.

Casnr: 108-98-5 Stofnaam: Benzeenthiool
Synoniemen: Fenylmercaptaan; Thiophenol

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 0,5	2			Ned:		
USA	1992: 0.5	2.3			USA:		
UK	1992: 0.5	2			UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992: 0,5	2,3			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -15 °C

BOILING POINT: 168 °C

VAPOR PRESSURE: 1 mm Hg (at 18 °C) (corresponding of 1.3 ppm).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: De stof ondergaat waarschijnlijk eerst S-methylering, gevolgd door oxidatie, resulterend in methylphenylsulfone.

ELIMINATION: Methylphenylsulfon wordt uitgescheiden met de urine.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Bij het konijn werkt de stof zeer sterk irriterend op het oog en de huid.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rat)= 148 mg/m3; (muis)= 125 mg/m3. Verschijnselen waren voor alle species en toedieningsroutes hetzelfde, nl. verschijnselen van een CZS stimulans, gevolgd door een CSZ post-convulsie-depressie. Dieren die het excitatie-stadium overleefden, vielen in een een of twee dagen durende slaap. SHORT TERM TOX: (Blootstellingsduur onbekend:) Bij de muis werden na hoge doses, long-, lever- en nierveranderingen gezien.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (spreeuw)= 32 mg/kg; (koperwiek; merel)= 24 mg/kg; (rat)= 46 mg/kg (= omgerekend 214 mg/m3). LD50 ip (rat)= 10 mg/kg; (muis)= 25 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: (SC:) Herhaalde injecties (dosering?) veroorzaakten verdikkingen van het miltkapsel en irritatie van het peritoneum. Lichte nierveranderingen met hyaline neerslagen in de tubuli en hyperemie van het niermerg.

3.4:DERMAL: LD50 (rat)= 300 mg/kg; (konijn)= 134 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Benzeenthiool is een huidirriterende stof.

SENSITIZATION (SK/RESP):

ACUTE TOX: De stof wordt geclassificeerd als middelmatig toxisch. Het kan ernstige dermatitis veroorzaken, hoofdpijn en duizeligheid.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de beperkte proefdiergegevens en op het feit dat de stof een wijde toepassing kent, zonder dat er aanwijzingen zijn voor chronische effecten.

Casnr: 1304-82-1 Stofnaam: Bismuthtelluride
Synoniemen: Dibismuth tritelluride

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 585 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX: Honden, konijnen en ratten werden gedurende 11 maanden; 5 dg/wk; 6 u/dg, blootgesteld aan 0,4 um doorsnede stof, in een concentratie van 15 mg/m3. Er werden longafwijkingen gevonden die gelijk zijn aan de afwijkingen bij blootstelling aan inert stof.
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op die voor inert stof.

Casnr: 1304-82-1 Stofnaam: Bismuthtelluride (Se- doped)
Synoniemen: Dibismuth tritelluride Selenium doped

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5	10		UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 585 °C.

(In TLV onderbouwing wordt gesproken van SnTe-doped bismuthtelluride.)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Er is uitgegaan van een commercieele mix, bestaande uit 80,04 mol% bismuthtelluride en 0,20 mol% tin(?)telluride, met een kleine overmaat aan tellurium.

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX: Honden, ratten en konijnen werden gedurende 1 jaar; 5 dg/wk; 6u/dag; blootgesteld aan 15 mg/m3 Se-doped Bismuthtelluride stof van 1,04 µm doorsnede. Groei-snelheid, hematologie en AF van serum, long, lever en nier, waren hetzelfde als bij controlegroepen. Na 6 maanden ontstonden in de longen van de honden granulomen zonder fibrosis, die 4 maanden na stoppen van de expositie kleiner waren geworden. De konijnen vertoonden gelijke effecten maar met minder long-macrophagen. De ratten hadden minder granulomen, maar ontwikkelden sommige gebieden met epithelisatie van de alveolaire wanden. Alle drie de species vertoonden ophopingen van stof in de lymfeknopen, zonder cellulaire reacties.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de resultaten uit de dierproeven met de opmerking dat de longveranderingen mild en reversibel waren, dus met geen serieuze physiologische consequenties.

Casnr: 1330-43-4 Stofnaam: Boraten, (tetra)natriumzouten, anhydride
 Synoniemen: Disodium tetraborates, Natriumtetraborat, vandfri

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	1			UK: Nee		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 MELTING POINT: 741 °C.

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:
 ACUTE TOX (LOC/SYST):
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP): Acuut irriterend na contact met huid, en mucosa van
 ogen, neus en andere delen van de respiratietractus.
 SENSITIZATION (SK/RESP):
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het geloof dat
 deze waarde voldoende beschermd tegen acute irriterende effecten.

Casnr: 1303-96-4 Stofnaam: Boraten, (tetra)natriumzouten, decahydraat
Synoniemen: Borax

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: -		5			Ned:		
USA	1992: -		5			USA:		
UK	1992: -		5			UK:		UK:
BRD	1992: -					BRD:		BRD:
Den	1992: -		5			Den:		
Zwed	1990: -		2	-	5	Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 62 °C. At higher temperatures it loses water molecules; at 320 °C it becomes anhydrous.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake by all mucous membranes, not via intact skin, but certainly via damaged skin.

BIOTRANSFORMATION: Borate has an unusually high affinity for Vit. B2 (SCG).

ELIMINATION: Borate is excreted in urine; unchanged or as a riboflavin-borate-complex (SCG).

3:ANIMAL EXPERIMENTS: Because of the high affinity for binding with Vit. B2, borates can cause a Vit. B2 deficiency (SCG).

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Reduction of male fertility and damage to the embryo are critical effects which already showed at 20 mg/kg/day (= omgerekend 92 mg/m3) (SCG).

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Local irritation of skin and mucous membrane can occur as a result of the heat, generated by the resorption of water to the anhydrous sodium tetraborate.

SENSITIZATION (SK/RESP):

ACUTE TOX: Systemic effects are changes in skin and mucous membranes (regardless of the path of exposure) causing reddening, alopecia, vomiting, diarrheabut also symptoms of menigeal irritation and CNS depression. When patients survived, all effects were reversible.

SHORT TERM TOX:

LONG TERM TOX: Reversible symptoms are loss of appetite, nausea, alopecia, dermatitis, hypoplastic anemia, fatigue and apathy (ACGIH, SCG). Also testicular damage was found in occupationally to borates exposed men; reduced sperm volume and -count and reduced viability of the sperm. Concentrations had often exceeded 10 mg/m3 (SCG).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "There is no research or documentation which can be used to establish a connection between dose and effect/response for man." They refer to calculation of the ACGIH that exposure to 5 mg/m3 borates decahydrate, will not cause acute irritation.

ACGIH: "It is believed that a TLV of 5 mg/m3 will prevent the acute irritant effects."

Casnr: 11130-12-4 Stofnaam: Boraten, (tetra)natriumzouten, pentahydraat
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	1			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 200 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): Acuut irriterend na contact met huid, en mucosa van
ogen, neus en andere delen van de respiratietractus.
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het geloof dat
deze waarde voldoende beschermd tegen acute irriterende effecten.

Casnr: 1303-86-2 Stofnaam: Boriumoxide
Synoniemen: Diboron trioxide

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	-	10			Ned:		
USA 1992:	-	10			USA:		
UK 1992:	-	10	-	20	UK:		UK:
BRD 1992:	-	15	-	75	BRD:		BRD:
Den 1992:	-	10			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 450 °C.
BOILING POINT: 1500 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Huidapplicatie bij konijnen resulteerde in enkele dagen durende roodheid. Applicatie in het oog resulteerden in acute conjunctivitis.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Ratten, 10 weken; 6u/d; 5d/w; blootgesteld aan aerosolen van boriumoxide in concentraties van 470 mg/m3; en 12 weken aan 175 mg/m3; en 24 weken aan 77 mg/m3, ontwikkelden als enige aanwijzing voor toxiciteit een milde nasale irritatie. De massa-mediane diameter van de partikels was 1,9-2,5 µm. Bij honden die gedurende 23 weken blootgesteld werden aan 57 mg/m3 (6u/d; 5d/w) was de urineproductie toegenomen (absoluut) en was de urine zuurder dan bij controlegroepen. Bovendien was er een toename van de creatinine-coëfficiënt.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat)= 2660 mg/kg, (muis)= 3450 mg/kg. LD50 na SC toediening (muis)= 1740 mg/kg en (cavia)= 1200 mg/kg.

SHORT TERM TOX: jonge ratten, die gedurende 3 weken per maagsonde een 10% wateroplossing met boriumoxide toegediend kregen, vertoonden geen effecten hiervan.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Oog- en luchtwegirritatie traden vaker op bij blootgestelde werknemers dan bij niet-blootgestelden.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Blootgestelde werknemers ondervonden meer last van oogirritatie, droge mond, neus of keel, rauwe keel en productief hoesten dan niet-blootgestelde werknemers. Concentraties van gemiddeld 4,1 mg/m3 (range 1,2-8,5 mg/m3) waren gemeten.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de lage toxiciteit van boriumoxide voor proefdieren. De uitkomsten van de epidemiologische studie worden beschouwd als onzeker. Er wordt nl getwijfeld of de gemeten gemiddelde concentraties boriumoxide wel de condities bepaalden die de vermelde symptomen veroorzaakten.

Casnr: 10294-33-4 Stofnaam: Boriumtribromide
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1C	10C			Ned:		
USA	1992:	1C	10C			USA:		
UK	1992:	-	-	1	10	UK: Nee		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	1C	10C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -46 °C

BOILING POINT: 90 °C

VAPOR PRESSURE: 40 mm Hg (at 14 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorption via and hydrolysis on mucous membranes.

BIOTRANSFORMATION:

ELIMINATION: The hydrolysis products are excreted in the urine.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: The toxicology of BBr3 probably resembles that of hydrogen bromide.

IRRITATION (SK/MM/EY/RESP): Main effect of HBr is irritation of the mucous membranes (HSE, ACGIH); NEL is 2 ppm; 5 ppm causes irritation (HSE).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

HSE: OES is set in analogy with and equivalent to HBR.

ACGIH: TLV is set in analogy with and equivalent to HBR, "assuming no additional, independent toxicity from BBr3 per se". This limit should prevent toxic injury and reduce the likelihood of irritation.

Casnr: 7637-07-2 Stofnaam: Boriumtrifluoride
Synoniemen:

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994: 1C	3C			Ned:	Nee	
USA	1992: 1C	2.8C			USA:		
UK	1992: -	-	1	3	UK:		UK:
BRD	1992: 1	3	2C	6C	BRD:		BRD:
Den	1992: 1	3			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -126.7°C

BOILING POINT: -99.9°C

VAPOR PRESSURE: > 1 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof werkt zeer irriterend op de longen en veroorzaakt na herhaalde blootstelling, pneumonie bij in dieren.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Blootstelling van zes soorten laboratoriumdieren aan 100 ppm resulteerde in hoge sterftcijfers.

SHORT TERM TOX: Blootstelling van zes soorten laboratoriumdieren aan 15 ppm, gedurende 30 dagen, resulteerde in sterfte van enkele dieren. Ratten, konijnen en cavia's werden gedurende maanden(?), 5d/w, blootgesteld aan 12,8; 3-4; en 1,5 ppm boriumtrifluoride. Dit resulteerde bij alle drie de blootstellingsniveau's in pneumonitis en tandafwijkingen (dit laatste werd geweten aan een hogere orale opname door het aflikken van de vacht). De pneumonitis in het laagste blootstellingsniveau was marginaal.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de bevindingen van de acute- en de 30-dagen test bij zes soorten laboratoriumdieren.

rtom: Nader onderzoek is nodig.

Casnr: 314-40-9 Stofnaam: Bromacil
Synoniemen: 5-Bromo-3-sec-butyl-6-methyluracil

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	1	10	2	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: between 157.5 and 160 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof is licht irriterend op de huid van cavia's.

SENSITIZATION: (SK/RESP): Geen huid-sensibilisatie trad op bij cavia's.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Ratten ondervonden geen hinder van een 4-uurs blootstelling aan 4800 mg/m3.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 voor mannelijke ratten = 5200 mg/kg.

SHORT TERM TOX:

LONG TERM TOX: NAEL (rat) =>250 ppm en < 1250 ppm (omgerekend tussen 59,2 en 288,8 mg/m3). Voor honden is de NAEL: 1250 ppm (= omgerekend 703,8 mg/m3).

CARCINOGENICITY: Er zijn in de chronische studies geen aanwijzingen gevonden, dat de stof carcinogeen is.

REPRODUCTION TOX: 250 ppm had geen negatief effect op de reproductie van ratten en konijnen (omgerekend vanuit de rat: 59,2 mg/m3; vanuit het konijn: ??). Er zijn in de chronische studies geen aanwijzingen gevonden, dat de stof teratogeen is.

OTHER STUDIES:

3.4:DERMAL: Konijnen ontwikkelden geen toxische verschijnselen na applicatie van 5000 mg/kg Bromacil. Na sectie werden geen macroscopische pathologische veranderingen aangetroffen.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de lage acute- en chronische toxiciteit bij proefdieren.

Casnr: 7726-95-6 Stofnaam: Broom
Synoniemen: Bromine

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,1	0,7			Ned:		
USA 1992:	0.1	0.66	0.3	2.0	USA:		
UK 1992:	0.1	0.7	0.3	2	UK:		UK:
BRD 1992:	0,1	0,7	0,2C	1,4C	BRD:		BRD:
Den 1992:	0,1	0,7			Den:		
Zwed 1990:	0,1	0,7	0,3	2	Zwed:		Zwed:

MAK is established in 1961.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -7.2 °C

BOILING POINT: 59 °C

VAPOR PRESSURE: 173 mm Hg (at 20 °C)

ODOR THRESHOLD: < 0.01 ppm (DFG).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Workin mechanism is the same as for chlorine (DFG).

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (mice) = 174 ppm (30 min.); 40 ppm (3 hours) and 20 ppm (6 hours).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Concentrations of 0.02 - 0.05 ppm are slightly irritating to the mucous membranes; 0.5 - 1.0 ppm are already unpleasant at short exposures and 1 ppm is excessively irritating. Higher (1 - 5 ppm) concentrations cause bronchospasms and peribronchial pneumonia (DFG). According to ACGIH maximal allowable concentration for short exposures (0.5 - 1 hour) should be 4 ppm.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: MAK is based on the subjective irritation data and the experimental similarity with chlorine.

ACGIH: TLV should prevent irritation of the respiratory passages and injury to the lungs.

Casnr: 74-97-5 Stofnaam: Broomchloormethaan
 Synoniemen: Chloorbroommethaan; Methyleenchloorbromide; CBM; Halon 1011

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	200	1050			Ned:		
USA 1992:	200	1060			USA:		
UK 1992:	200	1050	250	1300	UK:		UK:
BRD 1992:	200	1050	400	2100	BRD:		BRD:
Den 1992:	200	1050			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -86.5 °C.

BOILING POINT: 67 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Broomchloormethaan wordt in ratten en mensen (gedeeltelijk) omgezet in CO, net als andere dihalomethanen.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Muizen en ratten stierven na 15 minuten blootstelling aan resp. 142-150 en 152-170 g/m3 broomchloormethaan. Blootstelling aan 3000 ppm veroorzaakte bij ratten een lichte narcose. Onder en boven 27.000 ppm (?) ontstond een reversibel longoedeem en een interstitiele pneumonie, die later leidde tot de dood (blootstellingsduur wordt niet vermeld). Twee van de drie cavia's stierven na blootstelling aan 106 g/m3 gedurende 2 uur.
 LC50 na een 7 uurs blootstelling (muis) = 3000 ppm. Torkelson (onderzoeker van Dow) vond dat ratten een 7 uur durende blootstelling aan 5000 ppm, overleefden.
 SHORT TERM TOX: Er werd geen sterfte gezien bij ratten, konijnen en honden, na blootstelling aan 1000 ppm; 7 u/d; 5 d/w; gedurende 14 weken. Verschijnselen bij sectie waren: congestie van de viscera; vette degeneratie van de lever, nier en soms ook het hart; verdwijnen van vet uit de bijnierschors; interstitiele pneumonitis en in gestorven dieren, vertroebeling van de ogen. Deze veranderingen waren grotendeels of helemaal verdwenen, indien de dieren langer dan 72 uur na de eerste (?) blootstelling opgeofferd werden.
 Herhaalde (?) blootstelling aan 1000 ppm, gedurende 6 maanden, resulteerde in adverse effecten bij verschillende diersoorten; hele kleine effecten werden gezien bij vrouwelijke ratten, bij 500 ppm. Geen effecten werden gezien bij 370 ppm (Torkelson). Ze concludeerden dat broomchloormethaan in hoge concentraties een nogal verlengde anesthesie veroorzaakte, en slechts een gering vermogen had om reverseerbare leverschade te veroorzaken. Een andere onderzoeker vond, (naast vrijwel gelijke pathologische bevindingen), dat er tijdelijke degeneratieve veranderingen plaatsvonden in de lever, maar Torkelson bestempelde deze als niet significant.

Ratten vertoonden een geringe groeivertraging na herhaalde blootstelling aan 500 ppm, gedurende "several" maanden. Gedurende het eerste gedeelte van de blootstelling trad een lichte sedatie op.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (muis) = 4300 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY: Geen data gevonden.

REPRODUCTION TOX: Geen data gevonden

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Ames test en gist-test waren negatief.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Korte, zeer hoge(?) blootstelling van drie brandweermannen, (stof wordt gebruikt als brandblusmiddel) resulteerde in ernstige hoofdpijn, bewustzijnsverlies, maagstoornissen, gewichtsverlies en langzaam herstel.

SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Op basis van de beschreven
diergegevens werd het in 1986 niet nodig geacht om de TLV te veranderen.

Casnr: 7789-30-2 Stofnaam: Broompentafluoride
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,1	0,7			Ned:		
USA	1992:	0.1	0.72			USA:		
UK	1992:	0.1	0.7	0.3	2	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,1	0,7			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -60.5 °C.
BOILING POINT: 40.8 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Troebele cornea's en tranende ogen ontstaan na blootstelling aan 500 ppm acuut, en aan 100 ppm na 3 min.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Blootstelling aan 500 ppm, veroorzaakte gapen, ooglidzwellen, vertroebeling van de cornea, tranen, overvloedig speeksel en acute ellende. Bij blootstelling aan 100 ppm ontstonden na 3 min. symptomen en na 30 min; 50 ppm, vielen slachtoffers. (diersoorten niet genoemd).

SHORT TERM TOX:

LONG TERM TOX: Chronische expositie (?) boven 3 ppm resulteerde in ernstige nefrose in sommige dieren (diersoorten?); toxische hepatitis (hepatosis) en ernstige longproblemen.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de TLV van het verwante chloortrifluoride. Ze noemen het reasonable om aan te nemen dat de twee stoffen analoog aan elkaar zijn, ook voor wat betreft de toxiciteit.

Casnr: 106-97-8 Stofnaam: Butaan (n-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	600	1430			Ned:		
USA	1992:	800	1900			USA:		
UK	1992:	600	1430	750	1780	UK:		UK:
BRD	1992:	1000	2350	2000C	4700C	BRD:		BRD:
Den	1992:	500	1200			Den:		
Zwed	1990:					Zwed:		Zwed:

Geen TLV onderbouwing aanwezig; waarde = afgeleid van CIR rapport

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: °C

BOILING POINT: °C

VAPOR PRESSURE: mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

Casnr: 109-79-5 Stofnaam: Butaanthiol
Synoniemen: Butylmercaptaan

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994: 0,5	1,5			Ned:		
USA	1992: 0.5	1.8			USA:		
UK	1992:				UK:		UK:
BRD	1992: 0,5	1,5	1C	3C	BRD:		BRD:
Den	1992: 0,5	1,5			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -115.9 °C.

BOILING POINT: between 97.2 and 101.7 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Lichte oogirritatie trad op bij blootstelling aan 2500 ppm (muis) of 4020 ppm (rat)?

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (muis) bij 4 uur expositie = 2500 ppm, en (rat) = 4020 ppm. In een eerdere studie bleek dat 770 ppm in 30 minuten letaal was voor honden.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Reukgrens ligt tussen 0,001 en 0,0001 ppm. Bij concentraties van 0,1 tot 1 ppm wordt de geur goed opgemerkt. De TLV is in feite gebaseerd op deze reukgrens en de analogie met ethylmercaptaan. Er wordt gezegd dat enkelvoudige blootstellingen bij verschillende diersoorten heeft uitgewezen, dat butaanthiol slechts "een beetje" toxisch is. De TLV-cie. geeft aan dat er wellicht luchtverontreinigings-problemen kunnen ontstaan omdat de reukgrens wordt overschreden.

Casnr: 109-73-9 Stofnaam: Butylamine (n-)
Synoniemen: Aminobutaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5C	15C			Ned: Ja		
USA	1992:	5C	15C			USA: Ja		
UK	1992:			5	15	UK: Ja		UK:
BRD	1992:	5	15	25	75	BRD: Ja		BRD:
Den	1992:	5	15			Den: Ja		
Zwed	1990:	5C	15C			Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -50 °C

BOILING POINT: 78 °C

VAPOR PRESSURE: 72 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorbed via the respiratory and gastrointestinal tract and the skin.

BIOTRANSFORMATION: "It is likely to be extensively metabolised in common with other aliphatic amines" (HSE). "Amino oxidases are found in the liver, kidneys, intestines etc of mammals; the primary biotransformation products are various carboxyl acids and urea" (SCG).

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is extremely damaging on the rabbits eye. After application on the skin of guinea pigs, necrosis followed (ACGIH).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure at 4000 ppm was lethal for rats in two to five minutes; no deaths were reported at 2000 ppm for four hours. At (near) lethal concentrations, increased reflex excitability; respiration and pulse rate, convulsions, dyspnea and cyanosis and coma occurred (HSE, ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 500 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (guinea pig) = 366 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Skin and eyes: severe burns. Respiratory tract: irritation, with as maximal effect pulmonary edema (ACGIH). Exposure at only a few ppm resulted in redness of the face (SCG, ACGIH). There are divergent opinions about the skin irritating properties of the compound (SCG).

HSE: "Daily exposure at concentrations below 5 ppm produced no reports of symptoms; at 5 to 10 ppm caused eye and respiratory tract irritation and headaches, although more detailed data are lacking (SCG). Above 10 ppm, exposure became intolerable after a few minutes" (HSE).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "There is very little relevant information from which to estimate the risks of occupational exposure".

ACGIH: "A ceiling limit of 5 ppm is recommended to prevent significant irritation of skin, eyes and respiratory tract", since " industrial experience indicates that levels about 5 ppm may be irritating".

HSE: The OES is set at 5 ppm "to protect against irritant concentrations", where "minimum effect level was identified at around this level".

Casnr: 89-72-5 Stofnaam: Butylfenol (o-sec-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5	30			Ned:	Ja	
USA	1992:	5	31			USA:	Ja	
UK	1992:	5	30			UK:	Ja	UK:
BRD	1992:					BRD:		BRD:
Den	1992:	5	30			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: between 224 and 237 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na langdurig huidcontact ontstaan brandwonden.
Er ontstonden geen corneabeschadigingen na direct oogcontact.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Een 7 uren expositie aan een met damp verzadigde omgeving was voor ratten niet letaal.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 ligt tussen 0,6 en 2,4 g/kg voor cavia's. (= omgerekend LC50 tussen 4200 en 16.800 mg/m3)

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 voor cavia's ligt tussen 0,6 en 2,4 g/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Acute expositie resulteerde in milde luchtwegirritatie en brandwonden op de huid.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie van die van fenol en cresol. De TLV wordt als voorlopig gezien, tot er specifieke toxicologische gegevens bekend worden, aangezien de toxiciteit van alkylbenzeen-derivaten afhangt van het aantal en de lengte van de alkylgroepen.

Casnr: 2426-08-6 Stofnaam: Butylglycidylether (n-)
Synoniemen: BGE; 1-n-Butoxy-2,3-epoxypropaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	25	135			Ned:		
USA	1992:	25	133			USA: Nee		
UK	1992:	25	135			UK:		UK:
BRD	1992:	-	-			BRD: Ja	IIIB	BRD: Ja
Den	1992:	6	30			Den:		
Zwed	1990:	10	50	15	80	Zwed:		Zwed: Ja

NIOSH REL (1992): 30 mg/m3 (5.6 ppm) Ceiling; 15 min.

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 164 °C

VAPOR PRESSURE: 3 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Rapid uptake via the skin (DFG).

BIOTRANSFORMATION: Major metabolites are 3-Butoxy-2-acetylaminopropionic acid; 3-Butoxy-2-hydroxy-propionic acid and Butoxyacetic acid (DFG). BGE is reduced in the liver by the enzyme epoxide hydrase to form the corresponding diol (NIOSH). BGE has alkylating properties because the epoxide-ring of the compound will react with almost all nucleophilic substances (NIOSH). In 70% the N-7-alkyl derivative is formed (DFG).

ELIMINATION: Metabolites are excreted in the urine after oral administration (rats and rabbits).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The solution is irritating to the eyes.

SENSITIZATION: (SK/RESP): DFG, NIOSHa: The compound is sensitizing in guinea pigs. Cross reactions occur with alkylglycidylether (C12 -C14 chains) and cresylglycidylether (DFG, NIOSH).

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (four hours) (mice and rats) is respectively 3500 (DFG, ACGIH, NIOSH) and 2590 ppm (DFG); at 8 hours exposure (rat) LC50 is 1030 ppm (DFG, NIOSH) or 670 ppm (ACGIH), all three documents referring to the same study. In other studies however, respectively zero and one rat died out of six, when exposed during four and two hours at respectively 4000 ppm and nearly saturated air (about 4200 ppm) (DFG). Before dying, the animals showed irritation of the mucous membranes, dyspnoe, depression of the CNS, delirium and lung edema. Both the surviving and dead animals showed post mortem irritation of the lungs with histologically detectable pneumonitis and localized inflammation, and congestion in the liver (DFG, NIOSHa).

SHORT TERM TOX: MAEL in rats = 18.5 ppm (6 h/d; 5 d/w; 28 days); effect was significantly increased lymphocyte count; exposure at 92.5 ppm (same regime) caused histopathologic changes (degeneration of the mucous membrane of the nose, and hyperplasia-metaplasia of the ciliar epithelium of the respiratory tract).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Exposure at 75 and 300 ppm (7 h/d; 5d/w; 50 days) caused testis atrophy in respectively 10 and 80% of the exposed rats (NIOSH, DFG).

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat and mouse, intragastric adm) = 2050-3430 and 1530 mg/kg respectively. Toxic signs included labored breathing and CNS depression, preceded by ataxia and incoordination; reduced motor activity; agitation and excitement (NIOSH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip LD50 (rat and mouse) is respectively 1140 and 700 mg/kg.

3.4:DERMAL: LD50 (rabbit) varies from 2260 to 4930 mg/kg. BGE is irritating the skin of rabbits only after covered application (DFG).

4:MUTAGENICITY: DFG: Some Ames tests (with or without S9 mix) and some unscheduled DNA synthesis tests with BGE were positive; others negative. Positive was a micronucleus test in mice (ip administration); negative a host-mediated-assay (mice); micronucleus tests with mice after oral admi-

nistration and Ames tests with urine of treated mice. A dominant lethal test was positive (NIOSH, DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): BGE is irritating to eyes, nose and respiratory tract. For skin irritation NEL is 1.25% solution in paraffin (dermal application) (DFG, NIOSH).

SENSITIZATION (SK/RESP): BGE is a strong, dose dependent allergen (DFG, ACGIH, NIOSH). Cross-sensitization with epoxy resins occurs (DFG, NIOSH).

ACUTE TOX: After a probably high exposure at a mixture (unknown composition) containing BGE, two workers showed vomiting, nausea, coughing, headache, irritation of the mucous membranes and ataxia. The nausea, vomiting (which progressed into haematemesis) and headache continued for more than two months (DFG).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: No MAK is set because there is not sufficient relevant information.

SAR and the positive results of some of the mutagenicity/genotoxicity tests make the compound suspected of carcinogenicity. Therefore the IIIB notation is added. Also, the compound is a strong sensitizer and is easily absorbed through the skin, which requires a skin and a sensitizing notation.

ACGIH: The safety margin between LD50 in rats and the former TLV (50 ppm) was only 13. In order to increase this margin the TLV is lowered to 25 ppm.

NIOSH: because no long term inhalatory studies have been done "calculation of a safe exposure concentration is not possible". Because it is a mammalian mutagen and it causes skin and eye irritation and sensitization, a REL "at the lower limit of detectability" is recommended as a ceiling concentration for a 15-minute sampling period.

Casnr: 138-22-7 Stofnaam: Butyllactaat (n-)
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	5	25			Ned:	Nee	
USA	1992:	5	30			USA:		
UK	1992:	5	25			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	5	25			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 188 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Langdurige blootstelling aan 7 ppm, met kortdurende pieken van 11 ppm, veroorzaakte bij werknemers hoofdpijn, irritatie aan mucosa van larynx en pharynx en hoesten van alle werknemers. De conjunctivae waren niet geïrriteerd. De expositie, gemeten door persoonlijke monitoring, was 4 ppm. Bij blootstelling aan 1,4 ppm bleven de klachten weg.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Werknemers, die gedurende langere tijd blootgesteld werden aan 7 ppm, met pieken van 11 ppm, klaagden over slaperigheid en hoofdpijn, s'avonds na het werk. Soms trad er misselijkheid en braken op. Routine bloed- en urine onderzoek leverde geen bijzonderheden op.

Bij blootstelling aan 1,4 ppm bleven de klachten weg.

In een ander onderzoek (met verbeterde analyse- en monsternamemogelijkheden, werden er bij blootstelling aan 7 ppm geen verschijnselen gevonden (ook niet van irritatie).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de beschreven bevindingen.

Casnr: 98-51-1 Stofnaam: Butyltolueen (p-tert-)
Synoniemen: 1-Methyl-4-tert-butylbenzeen; p-TBT

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	10	60			Ned:		
USA 1992:	10	61	20	121	USA:		
UK 1992:					UK:		UK:
BRD 1992:	10	60	20C	120C	BRD:		BRD:
Den 1992:	10	60			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -55 °C.

BOILING POINT: 192.8 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): irriterend op de luchtwegen

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Matig toxisch. Belangrijkste toxische effect is depressie van het CZS en irritatie van de luchtwegen.

SHORT TERM TOX: Herhaalde (?) blootstelling veroorzaakte veranderingen in de lever en de nieren. Na relatief lage (?) concentraties werden bij proefdieren microscopisch degeneratieve bloedingen gezien in het ruggemerg en de hersenen. Ratten, gedurende 26 weken dagelijks 1 tot 7 uur blootgesteld aan 25 ppm, vertoonden geen duidelijke (apparent) tekenen van toxiciteit. Bij 50 ppm trad er sterfte op bij 1 rat. Na 42 tot 71 blootstellingen trad bij 2 dieren ernstige spasticiteit van de flexoren of zwakte in de poten op.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: weinig toxisch

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: praktisch niet toxisch

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Irritatie van de luchtwegen kan optreden.

SENSITIZATION (SK/RESP):

ACUTE TOX: 5 ppm werd opgemerkt door vrijwilligers; 80 ppm werd niet speciaal onplezierig gevonden.

SHORT TERM: Tijdens productiewerkzaamheden (pilot-scale) traden bij sommige werknemers voorbijgaande lichte intoxicatieverschijnselen op: neusirritatie, misselijkheid, malaise, hoofdpijn, en zwakte op. Verschijnselen kwamen van de kant van het cardiovasculaire systeem (bloeddrukverlaging, verhoogde polsfrequentie, en een slechte reactie op de Master's test; een 2-staps hartprestatie-test), van de kant van het CZS en de huid. De helft van de blootgestelden vertoonden tremor en onrust; een kwart hadden tekenen van chemische contact irritatie van de luchtwegen.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de weinige beschikbare gegevens.

Casnr: 1317-65-3 Stofnaam: Ca-carbonaat
Synoniemen: Kalksteen; Limestone; Marmer

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:	Nee	UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Containing < 1% quartz. However in some cases the compound can contain 15-20% quartz (Zielhuis RA9/90).

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Using impure limestone with 3 to 20% quartz for stone dusting in coal mines, may contain a silicosis risk. Pure calcium carbonate would not cause silicosis, because it is eliminated from the lungs by solution.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Calcium carbonate is considered a nuisance dust. No occupational adverse health effects have been reported.

Casnr: 471-34-1 Stofnaam: Calciumcarbonaat
Synoniemen: marmer, krijt

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Casnr: 1305-62-0 Stofnaam: Calciumhydroxide
Synoniemen: Gebluste kalk

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: at 580 °C it releases water and changes to CaO. It absorbs carbon dioxide from the air, forming the carbonate.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 7,34 g/kg.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): Stof werkt caustisch op het gehele lichaamsoppervlakte, dus ook op de ogen en de luchtwegen.
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: De ervaring met de stof in de industrie is in het algemeen gunstig.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de niet ongunstige ervaring bij het industriële gebruik en de "recognised lesser alkalinity of the alkaline earths compared with the hydroxides of the alkali series". De limiet is afgeleid van die voor NaOH.

Casnr: 1305-78-8 Stofnaam: Calciumoxide
Synoniemen: kalk

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: -		2	-	5	Ned:		
USA	1992: -		2			USA:		
UK	1992: -		2			UK:		UK:
BRD	1992: -		5	-	10C	BRD:		BRD:
Den	1992: -		2			Den:		
Zwed	1990: -		2	-	5	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 2570 °C.

BOILING POINT: 2850 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Zeer irriterend voor mucosa en vochtige huid.
Voornaamste klachten na blootstelling aan kalkstof zijn irritatie van ogen en huid.

SENSITIZATION (SK/RESP):

ACUTE TOX: Inhaleren van kalkstof heeft aanleiding gegeven tot ontsteking van de voorste luchtwegen, ulceratie en perforatie van het neusseptum en zelfs longontsteking.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is bepaald naar analogie met NaOH.

Casnr: 10101-41-4 Stofnaam: Calciumsulfaat
 Synoniemen: gips; CaSO4.2H2O

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:	-	#			BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Casnr: 1563-66-2 Stofnaam: Carbofuraan
 Synoniemen: 2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamaat; Furadan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA:		
UK	1992:	-	0.1			UK: Nee		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: between 150 and 152 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (50% Wettable Powder; WP) = 108 mg/m3 voor mannelijke - en 133 mg/m3 voor vrouwelijke ratten. (blootstellingsduur is niet bekend).

LC50 75%WP = 53 mg/m3 bij cavia's. Bij een 6 uur durende blootstelling van Rhesusapen aan 0,56 mg/m3 (75% WP) trad geen, en bij 0,86 mg/m3 trad een lichte daling op van de cholinesterase activiteit.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 = 8,7 en 8,0 mg/kg voor resp. mannelijke en vrouwelijke ratten. De letale mediaan = 23,4 mg/kg (mannelijke rat).

SHORT TERM TOX:

LONG TERM TOX: NAEL (rat) = 25 ppm (= humaan omgerekend 5,9 mg/m3); (hond) = 20 ppm (= humaan omgerekend 11,3 mg/m3). Bij 50 ppm ontstonden remmingen in plasma-, erythrocyt- en hersen-cholinesterase.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 oculair = 21,5 en 18,0 mg/kg voor resp 25% en 75% WP bij ratten.

3.4:DERMAL: 1000 mg/kg veroorzaakte slechts geringe symptomen bij ratten. LD50 = 1350 mg/kg (mannelijke rat).

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Werknemers, die dagelijks aan 0,1 mg/m3 blootgesteld werden, vertoonden geen effecten.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de hoge orale en inhalatoire toxiciteit van carbofuran. Een advieswaarde van 0.25 mg/m3 werd om deze reden verlaagd naar 0,1 mg/m3.

Casnr: 120-80-9 Stofnaam: Catechol
Synoniemen: Pyrocatechol; 1,2-Benzeendiol

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5	20			Ned:	Nee	
USA	1992:	5	23			USA:		
UK	1992:	5	20			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	5	20			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 105 °C
BOILING POINT: 245.5 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION: Catechol wordt gedeeltelijk geoxideerd tot o-benzoquinon; gedeeltelijk treedt conjugering op met sulfaten, hexuronzuur en met andere zuren.
ELIMINATION: Catechol wordt bij konijnen in 2 tot 3 dagen na opname, uitgescheiden in de urine. Ongeveer 2% wordt als vrij, ongebonden catechol uitgescheiden in de urine.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 8 uur blootstelling aan 2800 mg/m3 veroorzaakte irritatie aan ogen en neus.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Een 8-uur durende blootstelling aan 1500 mg/m3 catechol veroorzaakte geen zichtbare verschijnselen; blootstelling aan 2800 mg/m3, veroorzaakte irritatie aan ogen en neus; lichte coordinatiestoornissen met spierspasmen binnen 4 uur, en tremoren binnen 8 uur.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 300 mg/kg (omgerekend 1400 mg/m3). Catechol wordt gemakkelijk vanuit de darmen geabsorbeerd.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: LD 50 (konijn) = 800 mg/kg. Catechol wordt bij muizen gemakkelijk gabsorbeerd door de huid.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): Huidcontact heeft geresulteerd in een eczemateuze-dermatitis.
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: Opname van catechol via de huid resulteerde in ziekteverschijnselen (vergelijkbaar met die na fenol opname), met duidelijke centrale effecten (convulsies). Catechol veroorzaakt een verhoogde bloeddruk, waarschijnlijk vanwege een perifere vasoconstrictie. Hoge doses (?) kunnen aanleiding geven tot degeneratieve veranderingen in de niertubuli.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op die voor fenol, aangezien de mate van toxiciteit vergelijkbaar zou zijn.

Casnr: 9004-34-6 Stofnaam: Cellulose
Synoniemen: Papiervezel

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

There is a Swedish consensus report on paper dust, discussing mostly paper dust in the paper manufacturing industry. Since a large number of chemicals are added in the papermaking process, it is difficult to determine what compound(s) are responsible for the toxic effect among workers. Some other chemicals measured in paper plants are: epichlorohydrine, asbestos (in former days), talc, formaldehyde (SCG).

1:PHYSIOCHEMICAL PROPERTIES: Paper dust is a mixture of particles and fibers. In one study, most of the fibers were organic, probably cellulose (SCG).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Some of the additives can cause skin reactions. Workers exposed to dust levels above 5 mg/m3 complained of throat irritation and "stuffy noses" (SCG). According to ACGIH airborne cellulose dust is non-irritating nor toxic.

SENSITIZATION (SK/RESP): Several of the added slimicides, and colophony (used in paper coatings) are sensitizing (SCG).

ACUTE TOX: Doses up to 30 g/day can be tolerated as a bulk laxative (non-nutritive bulk) (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: No reduction in lung function was reported among papermill workers (dust concentrations 0.1 - 9.8 mg/m3, average 1.6 mg/m3; > 5 mg/m3; and average 5.8 mg/m3). In two studies, workers with frequent exposition to concentrations considerably higher than 10 mg/m3 showed a significant reduction in lung function than in workers exposed to concentrations below 1 mg/m3, regardless of length of employment; or in unexposed workers (here non-smokers were compared). In one study, microorganisms seemed to cause this reduction in lung function. In a Finnish mortality study among papermill workers, there were no cases of death due to non-malignant respiratory diseases. There are inconclusive data about productive cough, and about chronic lung diseases among exposed workers, in higher and lower exposed groups (respectively above and below 5 mg/m3). A correlation between cerebrovascular diseases and the presence of paper industry in home towns, and an over-risk of ischemic heart disease in papermill workers (due to sulfur compounds exposure) are suggested (SCG).

"Increased occurrences of various kinds of tumors have been reported from the paper and pulp industry, but not among workers in papermills, where exposure to substances other than paper dust is less common. The increased risk for cancer can not be related specifically to paper dust" (SCG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is the effect on respiratory passages. No conclusions about carcinogenicity can be drawn.

ACGIH: Cellulose is considered an inert or nuisance dust, with little adverse effect on the lungs. Adverse effects associated with cellulose containing products are attributable to impurities.

Casnr: 21351-79-1 Stofnaam: Cesiumhydroxide
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2			Ned:		
USA	1992:	-	2			USA:		
UK	1992:	-	2			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 272.3 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 1016 mg/kg (omgerekend humane LC50 = 7112 mg/m3).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): Een 5% oplossing werkte niet irriterend op de huid, maar was uitermate irriterend en corrosief na oogcontact.
SENSITIZATION (SK/RESP): De stof werkt niet sensibiliserend op de huid.
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op een vergelijkende acute-toxiciteitstest van CsOH met KOH.

Casnr: 600-25-9 Stofnaam: Chloor-1-nitropropan (1-)
Synoniemen:

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 2	10			Ned:		
USA	1992: 2	10			USA:		
UK	1992:				UK:		UK:
BRD	1992: 20	100			BRD:		BRD:
Den	1992: 2	10			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 170.6 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof is minder irritant voor longen en huid dan 1,1-dichloor-1-nitroethaan (?).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): 6 uur expositie aan 393 ppm doodde 1 van de 2 konijnen en nul van de 2 cavia's. Bij een gemiddelde blootstelling aan 2574 ppm, stierven beide konijnen en geen enkele cavia.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (konijn) = tussen 50 en 100 mg/kg (omgerekende LC50 hum. = 350 - 700 mg/m3). De stof is toxischer dan 1,1-dichloor-1-nitroethaan. Hoge doses kunnen schade aan de hartspier, lever en nieren opleveren.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de orale LD50 van konijnen (50 ppm). Voorstel daarvan uitgaande was TLV van 20 ppm. Aangezien de gechloreerde nitroalkanen toxischer zouden zijn dan de "gewone" nitroalkanen, werd een TLV vastgesteld die aanzienlijk lager was dan de 25 ppm voor nitropropan.

Casnr: 1929-82-4 Stofnaam: Chloor-6-(trichloor-methyl)pyridine (2-)
Synoniemen: Nitrapyrine; N-Serve

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10	-	20	USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 62.5 to 62.9 °C

BOILING POINT: 136 to 137.5 °C at 11 mm Hg.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Ratten en honden, die 93 dagen 15 mg/kg/dag gevoerd werden, vertoonden geen veranderingen in groei, algemeen voorkomen, gedrag, voedselopname, uiteindelijk lichaams- en orgaangewicht, mortaliteit, hematologisch, serum ureum en -alkalische fosfatase en macro- en microscopisch onderzoek van weefsels en organen (omgerekend rat: 70 mg/m3; hond: 241,5 mg/m3).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de short-term toxicology gegevens.

Casnr: 532-27-4 Stofnaam: Chlooracetofenon (alpha-)
Synoniemen: Fenacylchloride; traangas

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 0,05	0,3			Ned:		
USA	1992: 0.05	0.32			USA:		
UK	1992: 0.05	0.3			UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992: 0,05	0,3			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 56 °C.

BOILING POINT: between 244 and 245 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Oog (konijn): Blootstelling aan 0,06 en 0,163 g/l gedurende (eenmalig) 10 en 20 minuten, veroorzaakte een matige conjunctivitis, zonder beschadiging van de cornea. De huid ontwikkelde na een week a necrotic eschar. Het is een huid-irriterende stof bij konijnen (4% w/v), zowel na niet-afwassen als na afwassen met water. Na afwassen met water en zeep, trad de huidirritatie pas na minimaal 24 uur op. Applicatie op het oog van een 1,4% w/v oplossing bij konijnen veroorzaakte een tijdelijke oogirritatie, terwijl een 10% oplossing, een troebeling van de cornea veroorzaakte, die meer dan 55 dagen aanwezig bleef, met een iritis en conjunctivitis, gedurende 7 dagen aanwezig. Een 20% opl. zorgde bovendien voor uitvallen van de oogharen en deformatie van het ooglid op DTION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Geen histopathologische veranderingen werden bij dieren aangetroffen onder een blootstellingsniveau van 1000 mg-min/m3.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 71 tot 258 mg/kg, afhankelijk van het oplosmiddel (omgerekende LC50 hum. = 491 - 1806 mg/m3).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: Muizen, die gedurende 5 maanden, 2x per week applicaties kregen met 1/320 aceton-oplossing, ontwikkelden geen tumoren.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Irritatie van de huid en brandwonden is waargenomen, speciaal als de huid vochtig is. Tolerantie voor de irritatie treedt als de luchtconcentratie persisteert. Irritatie-drempels variëren van 0,15-0,4 mg/m3; traan-drempels van 0,3-0,4 mg/m3; en reukdrempel = 0,1 mg/m3.

SENSITIZATION (SK/RESP): Overgevoeligheid van ieschreven.

Individen zouden gesensibiliseerd kunnen worden voor traangas, door blootstelling aan 0-chlorobenzylidene malononitrile (kruis-reactie).

ACUTE TOX: Bij gebruik als traangas, kan chlooracetofenon letaal zijn, bijvoorbeeld na 10 min. 8500mg-min/m3. Een geextrapoleerde LC50 van 8000-11000 mg-min/m3 wordt ook genoemd. Een accidentele overbelasting met traangas kan leiden tot een irreversibele vertroebeling van de cornea (leukoom). Normaal gesproken zijn de verschijnselen die optreden na blootstelling, zoals ernstige conjunctivitis, wazig zien, en pijn, van tijdelijke aard. De concentratie waarbij zich ongelukken voordoen, ligt boven de 100 mg/m3; pas na 150-200 mg-min/m3 onttrekken vrijwilligers zich aan blootstelling.

Hoofdsymptomen zijn prikkeling in de neus met bloedneus, brandende keel en

ogen en tranen. Zwaardere blootstelling kan resulteren in longbloedingen en -oedeem. Dit laatste treedt meestal vertraagd op.

SHORT TERM TOX: Vrijwilligers, blootgesteld aan 350 mg-min/isch-toxische verschijnselen, terwijl deze doses wel irriterend werkten op de ogen en luchtwegen. (Duur blootstelling?). Er zijn geen permanente effecten aangetroffen na hoge blootstellingen bij navraag aan vrijwilligers en onderzoek van ziekenhuisgegevens.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Dermatitis is een algemeen voorkomend probleem bij werknemers bij de productie van traangas.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de minimale effectieve concentratie-tijd-waarde van 20 mg-min/m³, en op de vermelde informatie. Ook wordt genoemd de afwezigheid van chronische effecten bij mensen en dieren.

Casnr: 2698-41-1 Stofnaam: Chloorbenzilydeenmalonitril (o-)
Synoniemen: OCBM; CS

	tg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	0,05C	0,4C	Ned: Ja	Nee	
USA 1992:	0.05C	0.39C	USA: Ja		
UK 1992:			UK: Nee		UK:
BRD 1992:			BRD:		BRD:
Den 1992:	0,05C	0,4C	Den: Ja		
Zwed 1990:			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 95-96 °C.
BOILING POINT: 310-315 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION: Na inhalatie bij ratten en katten, treedt absorptie op in het bloed.
BIOTRANSFORMATION: CS wordt omgezet tot cyanide. Halfwaardetijd bij katten in het bloed is 5,5 seconden.
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Voor laboratoriumdieren is de stof na inhalatoire, intraveneuze, of subcutane toediening, weinig toxisch.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY: Kortdurend onderzoek gaf geen aanwijzingen voor carcinogeniteit.
REPRODUCTION TOX: Kortdurend onderzoek gaf geen aanwijzingen voor teratogeniteit, noch embryoletaliteit.
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): heftige oog- en huidirritatie kan ontstaan na contact met de stof.
SENSITIZATION (SK/RESP): Bij industrieel gebruik kan huid-sensibilisatie optreden. Er ontstaat een dermatitis van voornamelijk nek en armen.
ACUTE TOX: Naast heftige irritatie van ogen en huid, kan er hoesten, ademhalingsmoeilijkheden, beklemd gevoel op de borst, loopneus, duizeligheid, misselijkheid en braken optreden. Bij gebruik als "buiten gevecht-stellend gas" treedt er bij blootstelling aan 12-20 mg/m3, al binnen 20 sec effect op, dat 5-10 minuten na einde van de blootstelling nog voortduurt.
Na 90 minuten blootstelling aan 1,5 mg/m3, onstond er bij 3 van de 4 vrijwilligers hoofdpijn en bij 1 vrijwilliger lichte neus- en oogirritatie. Twee personen hadden 24 uur na expositie hoofdpijn. Bij blootstelling aan 4-5 mg/m3, traden denk-problemen op. Verhoogde temperatuur en luchtvochtigheid verlaagden de tolerantiegrens. Belangrijkste optredende symptomen waren: oogirritatie, conjunctivitis, tranen en verbranden van de huid. Er trad geen tolerantie op na herhaalde (10x in 2 weken) blootstelling. Bij experimenten bleek dat bepaalde individuen blootstelling aan 1-3 mg/m3, maximaal 4 minuten verdroegen.
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is uit de lucht komen vallen; men verwacht dat de hoogte ervan volstaat om acute toxische effecten te voorkomen.

Casnr: 55720-99-5 Stofnaam: Chloordifenyloxyde
 Synoniemen: Diphenylether, chlorinated; Chlorinated Diphenyloxyde

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
Ned	1994:	-	0,5			Ned:	Nee
USA	1992:	-	0.5			USA:	
UK	1992:					UK:	UK:
BRD	1992:	-	0,5			BRD: Ja	BRD:
Den	1992:					Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 BOILING POINT: 230-260 °C.
 The oxides are semisolids.

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:
 ACUTE TOX (LOC/SYST):
 SHORT TERM TOX:
 LONG TERM TOX: Na langdurige blootstelling cumuleert de stof in het lichaam, met als gevolg leverschade.
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP): Na lang huidcontact kan er op de plaats van expositie dermatitis ontstaan, eventueel gepaard gaande met jeuk.
 SENSITIZATION (SK/RESP):
 ACUTE TOX: Toxische effecten bestaan uit acneforme dermatitis, uit een systemische intoxicatie of uit beiden.
 SHORT TERM TOX:
 LONG TERM TOX: Werknemers, die veelvuldig contact hebben met gechlloreerde diphenyl ethers, hebben geen verschijnselen van systemische intoxicatie ontwikkeld.
 EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het advies van een onderzoeker die zelf rattenonderzoek heeft gedaan met gechlloreerde diphenyl oxides.

Casnr: 2921-88-2 Stofnaam: Chloorpyrifos
Synoniemen: 0,0-Diethyl-0-(3,5,6-trichloro-2-pyridinyl)phosphorothioate

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,2			Ned:	Ja	
USA	1992:	-	0.2			USA:	Ja	
UK	1992:	-	0.2	-	0.6	UK:	Ja	UK:
BRD	1992:					BRD:	Nee	BRD:
Den	1992:	-	0,2			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 42.5 to 43 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION: Chloorpyrifos wordt in dieren snel gemetaboliseerd (?).
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION: De dampspanning van de stof is te laag om voor problemen te zorgen als toxische damp; echter ingeademde partikels zorgen wel voor toxische effecten.

ACUTE TOX (LOC/SYST): Honden die gedurende 4 uur blootgesteld werden aan een thermische mist, of een vloeibare aerosol van 280 mg/m3, vertoonden een kleine verlaging van de cholinesterase-plasmaspiegel. Bij 140 mg/m3, traden geen veranderingen op. Bij schapen met dezelfde exposities traden helemaal geen veranderingen op. Konijnen die blootgesteld werden aan een ultra-lage volume spray, om zodoende een overdreven expositie na te bootsen, (?) vertoonden een lichte verlaging van de cholinesterase plasmaspiegel.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 = voor vrouwelijke en mannelijke ratten resp. 135 en 163 mg/kg; volgens een andere onderzoeker is de LD50 82 mg/kg.

SHORT TERM TOX:

LONG TERM TOX: Honden en ratten, die gedurende 2 jaar, 3,0 mg/kg chloorpyrifos gevoerd kregen, vertoonden geen systemische effecten, noch effecten die te wijten zouden zijn aan een verlaagde cholinesterase plasmaspiegel (omgerekend honden = 48,3 mg/m3; ratten = 13,9 mg/m3). Dagelijks 0,3 en 0,1 mg/kg, veroorzaakte resp. in de honden en de ratten geen daling in de plasmacholinesterase-activiteit (omgerekende NEL = resp. 4,8 en 0,2 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX: Een drie-generatie-test (1,0 mg/kg/dag) gaf geen bewijs voor teratologische of reproductie-effecten in de rat.

OTHER STUDIES:

3.4:DERMAL: LD50 (konijn) = 2000 mg/kg. Huidabsorptie treedt op.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Vrijwilligers, die blootgesteld werden aan een ultra-lage volume spray, om zodoende een overdreven expositie na te bootsen, vertoonden geen veranderingen in de cholinesterase plasmaspiegel.

SHORT TERM TOX: Vier huidapplicaties van 10 mg/kg gedurende 12 uur veroorzaakte geen, maar van 25 mg/kg veroorzaakte wel daling van de cholinesterase-bloedspegel. Cholinesterase spiegels in de erythrocyten bleef onveranderd. De stof veroorzaakt geen demyelinisatie.

Inhalatie van partikels is mogelijk en veroorzaakt daling van de cholinesterase plasmaspiegel.

Drie weken, 0,03 mg/kg oraal veroorzaakte geen significante daling in de cholinesterase plasmaspiegel; negen doses van 0,1 mg/kg per dag "caused reduction in plasma cholinesterase depression" (?) maar verder niet. Bij ingestie van 0,014; 0,03; en 0,1 mg/kg/dag gedurende 4 weken, onstond er alleen bij de hoogste dosering een daling in de cholinesterase plasmaspiegel. Vijf van zeven aan 0,5 % emulsie in sprayvorm blootgestelde werknemers,

vertoonde een daling van meer dan 50% in de cholinesterase-plasma- en -erythrocytenspiegel, binnen twee weken na aanvang van het spuitprogramma. Eenmalige blootstelling gedurende 3-8 minuten aan 0,8 uM/m³ (=ongeveer 0,28 mg/m³) van een thermische aerosol, veroorzaakte geen significante veranderingen in de cholinesterase spiegels.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Bij de voorgestelde TLV verwacht men meetbare veranderingen in de cholinesterase plasmaspiegels te voorkomen.

Casnr: 2039-87-4 Stofnaam: Chloorstyreen (o-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	285			Ned:		
USA	1992:	50	283	75	425	USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	50	285			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: - 63.15 °C.
BOILING POINT: 188.7 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX: Honden, ratten, cavia's en konijnen zijn gedurende een half jaar; 7 u/d; 5 d/week blootgesteld aan 101 ppm. Er waren geen effecten vastgesteld, alleen op het gebied van microscopisch onderzoek, werden er meer pathologische veranderingen in lever en nieren dan bij controledieren gevonden.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: De onderzoekers adviseerden een TLV van 50 ppm, aangezien blootstelling aan 100 ppm, marginale effecten veroorzaakte bij de vier soorten proefdieren.

Casnr: 95-49-8 Stofnaam: Chloortolueen (o-)
Synoniemen: 2-Chlorotoluene

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	50	250			Ned: Ja		
USA 1992:	50	259			USA:		
UK 1992:	50	250			UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	50	250			Den: Ja		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -35.1 °C
BOILING POINT: 159.2 °C
VAPOR PRESSURE: 10 mm Hg (at 43.2 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na huidapplicatie bij cavia's van 1 en 10 ml/kg onverdunde oplossing, trad er tamelijk ernstige locale irritatie op. Bij zowel geschoren als ongeschoren konijnen trad was matige huiirritatie te zien na 24 uur applicatie. Na toediening van een druppel, of van 0,1 ml op het oog van konijnen, trad er een vertraagde reactie op, gepaard gaande met roodheid van de conjunctivae, die in een van de beschreven testen binnen 5 dagen was verdwenen. Een fluorescentietest was na 7 dagen negatief. In een andere beschreven test, was bovendien na 24 uur het voorste gedeelte van de cornea troebel, hetgeen na 14 dagen wel weer zo ongeveer verdwenen was.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Ratten, 6 uur blootgesteld aan 4000 ppm, verloren hun coördinatie binnen 1,5 uur; uitputting ontstond na 1,75 uur en tremoren in 2 uur tijd. Ook trad er duidelijk vasodilatatie op. Geen sterfte trad op en de dieren waren na 2 weken 33 gram gegroeid (n=3).

Na blootstelling aan 14000 ppm ontstond coördinatieverlies, vasodilatatie, geforceerde ademhaling, narcose, rode (bloederige) tranen, maar alle dieren overleefden. Na blootstelling aan 175000 ppm stierf een dier; de andere twee waren ernstig uitgeput. Na 2 weken groeiden ze weer.

Muizen, ratten en cavia's, blootgesteld aan 4400 ppm, vertoonden geeuwen, ataxie en convulsies na resp 30, 45 en 45 minuten. Na 60 minuten waren alle dieren comateus. Alle muizen en ratten, en 7 van de 10 cavia's stierven. Bovendien stierf nog een cavia in de volgende 2 weken.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) >1600 mg/kg. Bij toediening van 50-100 mg/kg aan ratten (= omgerekend 230 - 460 mg/m3), ontstond er bij de hoogste doseringen matige tot duidelijke tekenen van zwakte en vasodilatatie. Er trad geen sterfte op en de groeistilstand was na 2 weken verdwenen.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: 1 en 10 ml/kg onverdunde vloeistof werd geapplianceerd op de huid van cavia's, gedurende 24 uur. Er trad gewichtsverlies op.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): In een fabriek waar de stof werd gebruikt, waren er na jaren nog geen irritatieverschijnselen gezien.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: In een fabriek waar de stof jarenlang gebruikt werd, waren er geen aanwijzingen van toxische effecten bij de mensen die met de stof werkten

(Twee meldingen).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de adviezen van mensen uit de chemische industrie, en andere "deskundigen".

Casnr: 7790-91-2 Stofnaam: Chloortrifluoride
Synoniemen: Chlorine trifluoride

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,1C	0,4C			Ned:		
USA 1992:	0.1C	0.38C			USA:		
UK 1992:					UK:		UK:
BRD 1992:	0,1	0,4	0,2C	0,8C	BRD:		BRD:
Den 1992:	0,1C	0,4C			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: - 76.3 °C.
BOILING POINT: 11.75 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Blootstelling van ratten aan 800 ppm gedurende 15 minuten en aan 400 ppm gedurende 35 minuten was dodelijk; bij 13 minuten en 800 ppm overleefden de ratten de meeste testen (?). Blootstelling resulteert in ontsteking van mucosa, huidverbranding en ulceratie van de cornea.
SHORT TERM TOX: Twee honden die gedurende 6 maanden; 5 d/w; 6 u/d blootgesteld werden aan 1,17 ppm vertoonden als eerste verschijnselen van toxiciteit hoesten, niezen, bloedneuzen, speekselen, "panting" en van tijd tot tijd een schuimende uitvloeiing uit de bek en neus. Na ongeveer twee maanden hadden de honden terugkerende aanvallen van longontsteking. Een hond overleed na 115 dagen. Twintig ratten die een zelfde expositie ondergingen, hadden minder ernstige verschijnselen, maar na enkele weken ontstond er een bloederige uitvloeiing rond de "nares??" en bek. Er stierven 6 ratten tijdens het experiment. Bij sectie van alle dieren (ook de overlevenden) werd ernstige longirritatie gevonden.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld met de verwachting dat deze voldoende laag zal zijn om ernstige schade te voorkomen. De TLV is al in 1955 voorgesteld.

Casnr: 14977-61-8 Stofnaam: Chromylchloride
Synoniemen: Chrom (VI)- verbindingen

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,025	0,15			Ned:		
USA	1992:	0.025	0.16			USA:		
UK	1992:	-	0.05M			UK:		UK:
BRD	1992:	-	-	-	-	BRD:	IIIA2	BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -96.5 °C

BOILING POINT: 116 °C

VAPOR PRESSURE: 20 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Risk-phrase numbers R8; R35 and R43 are given (HSE).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Sc LD50 (mice) = 5.45 mg/kg (ACGIH).

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: NIOSH considers the compound as an inferred carcinogen (ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

HSE has set a MEL for all hexavalent chromium compounds instead of a OES, in view of the serious health effects and the lacking of a NEL. Also the TLV committee has set the same limit (as Cr) as for the other hexavalent chromium compounds. They suggest that "according to the chemical and physical properties of chromylchloride, it would belong to the group of soluble dichromates, i.e. CrO₃, which are considered by NIOSH to be non-carcinogenic, rather than to the sparingly soluble chromates that appear to have been responsible for most chromate workers cancers."

Casnr: 2971-90-6 Stofnaam: Clopidol
Synoniemen: 3,5-Dichloro-2,6-dimethyl-4-pyridinol; Coyden

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:		10			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: >320 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (ratten, konijnen en cavia's) >8 g/kg.
SHORT TERM TOX:
LONG TERM TOX: Ratten en honden, die gedurende 2 jaar respectievelijk 15 en 5 mg/kg/dag gevoerd werden vertoonden geen nadelige effecten (omgerekende hum. NEL = 70 resp. 24 mg/m3).
CARCINOGENICITY: In de hierboven beschreven proef werd geen verhoogde tumorincidentie gevonden.
REPRODUCTION TOX: Geen effecten op fertiliteit, zwangerschap, levensvatbaarheid (van nakomelingen), lactatie en teratologische effecten werden gevonden bij ratten en konijnen (zelfde doseringen als chronische orale proef?).
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de lage chronische toxiciteit.

Casnr: 123-73-9 Stofnaam: Crotonaldehyde
Synoniemen: trans-2-Butenal

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	2	6			Ned:	Nee	
USA	1992:	2	5.7			USA:		
UK	1992:	2	6	6	18	UK:		UK:
BRD	1992:	-	-			BRD:	Ja	IIIB
Den	1992:	2	6			Den:		BRD:
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -76.5 °C
BOILING POINT: 104 °C
VAPOR PRESSURE: 18.75 mm Hg (at 20 °C)
ODOR THRESHOLD: 0.2 ppm (DFG); 7 ppm (ACGIH)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: the compound can react in the body as an electrophilic substance; with thio-groups of oligo-peptids and proteins (DFG).

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (30-min) in rats is 1500 or 600 ppm. Exposure (four hours) at 100 ppm is fatal for rats. Exposure at 10 ppm for 200 minutes (rats) resulted in changes in pulmonary performance (ACGIH). Toxic symptoms after inhalatory intake include dyspneu, bradypneu and a reduced gas exchange in the lungs. These symptoms are reversed several days after the end of exposure. At higher exposure levels, (immediately reversible) excitation occurs in mice. Post mortem changes indicated damage of the bronchioli, with congestion of the lungs and a hemorrhagic rhinitis (DFG); the compound is considered a deep lung irritant (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mice and rats) is respectively 240 and 300 mg/kg bw (DFG). LC50 (30-min) in rats is 1500 or 600 ppm.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rabbits and guinea pigs) is respectively 380 and 30 mg/kg bw.

4:MUTAGENICITY: DFG: Several Ames tests were negative, as well as a Saccharomyces recombination test and a micronucleus test in mice. The compound showed no transforming properties in mouse cells. A modified Ames test and a Intravascular-Host-mediated-Assay were positive with S.typhimurium TA 100. After ip application of 20 mg 2-butenal/kg bw, chromosomes in all stages of spermatogenesis were damaged.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Crotonaldehyde irritates the mucous membranes of the eyes and respiratory tract. NEL = 15 ppm (exposure time 0.5 min.) (DFG). When exposure time = 15 min. irritation still occurs at a concentration of 4.1 ppm, with lacrimation starting after 30 sec.

SENSITIZATION (SK/RESP): One unpublished case of apparent sensitization is reported (ACGIH).

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: The MAK (dating from 1966) can not be underpinned. Further research is needed. Because of cytotoxic and mutagenic properties, a IIIB notation is added.

ACGIH: TLV is set in analogy with and related to the toxicity of acrolein.

Casnr: 299-86-5 Stofnaam: CrufomaatR
 Synoniemen: 4-tert-Butyl-2-chlorophenyl N-methyl O-methylphosphoramidate

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:		5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 60 to 60.5 °C.

BOILING POINT: 117 to 118 °C at 0.01 torr (= 0.01 mm Hg).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 voor ratten, konijnen, cavia's en honden ligt tussen de 490 en meer dan 1000 mg/kg.

SHORT TERM TOX:

LONG TERM TOX: Ratten en honden, die gedurende 2 jaar, 5 mg/kg gevoerd kregen vertoonden als enige effect een daling (40-50%) in het plasma- en erythrocyten-cholinesterase. De NAEL voor rat en hond was resp. 2 en 1 mg/kg (omgerekende NEL = resp. 10 en 16 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX: Een drie generatie-studie bij ratten die 5 mg/kg crufomaat gevoerd kregen, vertoonden geen teratologische, noch reproductie effecten.

OTHER STUDIES:

3.4:DERMAL: Opname via de huid kan optreden, men verwacht (!) echter, dat effecten hiervan slechts optreden na contact met een hoge dosis.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Vrijwilligers, die gedurende een week 3 mg/kg crufomaat consumeerden, ontwikkelden geen daling in hun cholinesterasespiegel, noch andere symptomen.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: De vastgestelde TLV zou voldoende laag moeten zijn om daling in erythrocyten- en plasma-cholinesterasespiegels te voorkomen.

Casnr: 74-90-8 Stofnaam: Cyaanwaterstof
Synoniemen: Blauwzuur; Hydrogen cyanide

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	10C	11C			Ned: Ja		
USA	1992:	10C	11C			USA: Ja		
UK	1992:			10M	10M	UK: Ja		UK:
BRD	1992:	10	11	20	22	BRD: Ja		BRD:
Den	1992:	5	5			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -13.4 °C

BOILING POINT: 25.6 °C

VAPOR PRESSURE: 620 mm Hg (at 20 °C)

ODOR THRESHOLD: 0.2 - 5.1 ppm; perception can vary significantly between individuals (DFG, HSE)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Rapid uptake via lungs and skin results in blocking cellular respiration and sudden death.

BIOTRANSFORMATION:

ELIMINATION: The cyanide is excreted mainly in the urine (after transformation into thiocyanide), but is also exhaled as HCN or as CO₂ (DFG, HSE). In animal studies was found that detoxification of CN⁻ keeps pace with the uptake from the air, beyond the limit of 10 ppm (DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Acute inhalatory data vary considerably and are equivocal. It seems that exposure to 27-36 ppm cats did not show any symptoms.

SHORT TERM TOX: With intervals of 6-8 days, dogs were 19 times exposed at 45 ppm during 30 minutes. Intoxication signs like dyspnoe, intestinal signs, tremors and convulsions were seen. The animals died within 1-2 months. Post mortem findings were degenerations and hemorrhages in the central nervous system.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: One year daily 0.5 mg NaCN/kg bw (= omgerekend 8 mg/m³) caused typical intoxication symptoms in dogs. Blood changes (erythrocyte count, hemoglobin% and serumproteins constitution) were still found one year after the experiment was stopped. Rats, fed 100 - 300 ppm in the diet for two years (= omgerekend 23 - 69 mg/m³), showed an increased thiocyanate concentration in the tissues, but no changes in the thyroid. (In case detoxification and excretion results in an increased thiocyanate level in the blood, hypothyreoid struma and/or symptoms of thiocyanate intoxication can develop (DFG).)

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Exposure at 20 (18-36) ppm for a few hours resulted in headache, giddiness, gastro-intestinal upset, palpitations and difficulty in breathing. Exposure at 300 ppm is rapidly fatal and at 90 ppm for more than 30 minutes can be life threatening (HSE, ACGIH). Death follows when the blood concentration exceeds the critical limit of 5 µg CN⁻/ml (DFG). 6000 ppm is bearable during 50 minutes without any symptoms; at 22000 and 55000 ppm the exposure had to be interrupted after respectively 27 and 22 minutes (????????????; volgens eerder zouden ze al allemaal het loodje gelegd

hebben!). Oral lethal dose is 0.7-3.5 mg/kg body weight (calculated as CN-) (DFG).

SHORT TERM TOX:

LONG TERM TOX: The existence of long term adverse effects is equivocal: Workers exposed at levels between 4.2 and 12 (another study: 5-18) ppm for periods in the order of 7 years, experienced headache, vertigo, weakness, changes in taste and smell, irritation of throat, vomiting, effort dyspnea, lacrimation, abdominal colic, precordial pain and nervous instability. Also enlargement of the thyroid gland was reported (ACGIH). In another study no ill effects were reported from long term exposure at levels in the order of 10 ppm (ACGIH).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: It is supposed that the detoxification rate of cyanide in humans is the same as in animals. This means that the uptake resulting from 10 ppm in the air will be so rapidly detoxified, that no accumulation occurs. A skin notation is added because of the risk of skin resorption.

HSE: Critical effect is acute toxicity, with a steep dose-response curve. A MEL is set to control peaks of exposure. HCN has a potential for skin absorption, so a skin notation was considered appropriate.

ACGIH: A reduction to 3 ppm was recommended "to prevent the various non-specific effects noted by several investigators, and to provide a greater margin of safety against acute poisoning. A majority of the Committee, however, favored retention of the 10 ppm ceiling" in 1979.

Casnr: 420-04-2 Stofnaam: Cyanamide
Synoniemen: Carbodiamide; Hydrogen cyanamide

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
Ned	1994:	-	2			Ned:	Nee
USA	1992:	-	2			USA:	
UK	1992:	-	2			UK:	UK:
BRD	1992:					BRD:	BRD:
Den	1992:	-	2			Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 42 °C

BOILING POINT: 83 °C at 0.5 mm Hg

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof is erg caustisch en irriterend op de huid. Een oplossing van 25% veroorzaakte een minimale irritatie op de huid van konijnen. Na applicatie in de conjunctivaalzak van konijnen trad er een lichte irritatie op.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 125 (85-180) mg/kg (= omgerekend LC50 = 592 mg/m3).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Cyanamide heeft een remmende werking op aldehydedehydrogenase, vergelijkbaar met Disulfiram en Thiram, met een zesde maal de werkzaamheid van Thiram.

3.4:DERMAL: Applicatie van 10 ml/kg van een 25% oplossing, veroorzaakte bij konijnen geen sterfte, noch verschijnselen van systemische toxiciteit.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie met die voor andere irriterende stoffen. De waarde zou ook laag genoeg zijn om problemen met gelijktijdige opname van alcohol te voorkomen.

Casnr: x Stofnaam: Cyaniden
Synoniemen: KCN, NaCN

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned: Ja		
USA	1992:	-	5			USA: Ja		
UK	1992:	-	5			UK: Ja		UK:
BRD	1992:	-	5	-	10	BRD: Ja		BRD:
Den	1992:	-	5*			Den: Ja		
Zwed	1990:	-	5C			Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: The documentation concerns both KCN and NaCN.
MELTING POINT: 634 °C (NaCN); 563 °C (KCN)
VAPOR PRESSURE: ~ 0 mm Hg (at 20 °C) (both compounds)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Hydrolysis of the alkali cyanides produces HCN. This is metabolised into thiocyanate, which is a relatively non toxic chemical.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 in laboratorium animals is equivalent to inhaling air with a concentration of slightly over 100 ppm KCN or NaCN for 30 - 60 minutes.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 for laboratorium animals = 5 - 10 mg/kg (omgerekend LC50 = 23 -46 mg/m3). Absorption of 50 to 100 mg of the alkali cyanides results in immediate collapse and cessation of respiration. Lower doses may result in weakness, headache, confusion, nausea and vomiting.

SHORT TERM TOX: Failure to eliminate the metabolite thiocyanide is suggested as the cause of enlarged thyroid glands occurring in some workers exposed to cyanide salts.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Inhalation of slightly higher concentrations than 5 mg/m3 of the alkali cyanides resulted in nosebleed and nasal ulcerations. These effects have only partly been attributed to the alkalinity of the solutions.

SHORT TERM TOX:

LONG TERM TOX: Relatively few reports of chronic cyanide poisoning have been published.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The TLV-TWA is supposed to protect against irritation and injury of the respiratory tract, and prevent chronic effects, with a sufficient safety margin against acute effects.

Casnr: 506-77-4 Stofnaam: Cyanogeenchloride
Synoniemen: Chloorcyaan

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	0,3C	0,6C			Ned:		
USA	1992:	0.3C	0.75C			USA:		
UK	1992:			0.3	0.6	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,1	0,3			Den:		
Zwed	1990:	0,1	0,3	0,3	0,8	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -6 °C

BOILING POINT: 13.8 °C

VAPOR PRESSURE: 1001.9 mm Hg (at 20 °C)

ODOR THRESHOLD: At 1 ppm the odor is recognized.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorption via the lungs. In the blood the compound is mainly found as hydrogen cyanide, which is detoxified in the usual way (DFG).

BIOTRANSFORMATION: A cyanide radicale can be formed, which can interfere with the cellular metabolism (ACGIH).

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure (dogs; 20 min.) at 20 ppm was tolerated; concentrations above 100 ppm were lethal for various species in about twenty minutes or less (DFG); 500 and 120 ppm for 3 minutes was fatal to respectively mice and cats (ACGIH). Exposure at 48 ppm for 6 hours was fatal for a dog (ACGIH).

SHORT TERM TOX: Daily exposure of dogs and swine, (0.5 -2 hours/d; 2 weeks) at sub-lethal concentrations showed vomiting, diarrhea, irritation of eyes and upper respiratory tract, tachycardia, polypnea and weight loss. Severe lung congestion was found at post mortem (DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 (iv) in rabbits is 2.5 mg/kg (DFG).

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): The compound is irritating the respiratory tract and eyes (DFG). A LAEL (10 minutes) is reported to be 1 ppm; 2 ppm (10 min.) was unbearable and 48 ppm was fatal in 30 minutes (ACGIH). Also reported is that 0.7 ppm was intolerable, resulting in severe eye and nose irritation (ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Prolonged daily exposure caused chronic vomiting, diarrhea, coughing, dyspnea, lung congestion, chronic headache, cold sensation, skin irritation, edema of the eyelid, conjunctivitis and weight loss (DFG, ACGIH).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Because there are no relevant data found about the toxicity of cyanogen chloride, or about the analogy with phosgen, no proposal for a MAK Wert is made. Further research is needed.

ACGIH: "In order to prevent undue irritation and the possibility of cellular metabolic interference, it is recommended that cyanogen chloride not exceed 0.3 ppm as a ceiling limit."

Casnr: 110-83-8 Stofnaam: Cyclohexeen
Synoniemen:

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	300	1015			Ned:	Nee	
USA 1992:	300	1010			USA:		
UK 1992:	300	1015			UK:		UK:
BRD 1992:	300	1015	600	2030	BRD:		BRD:
Den 1992:	300	1015			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
FREEZING POINT: -103.7 °C
BOILING POINT: 83 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Bij eenmalige blootstelling van laboratoriumdieren aan 8850 ppm traden er duidelijke ziekteverschijnselen op en bij 14.800 ppm trad er sterfte op.
SHORT TERM TOX: Blootstelling van ratten, cavia's en konijnen gedurende 6 maanden; 5 d/w; 6 u/d aan 150; 300 en 600 ppm veroorzaakte bij alle drie de niveau's een significante stijging van alkalische fosfatase en bij het hoogste blootstellingsniveau, een daling in de groeisnelheid. De andere meest gemeten bloedparameters (hematologische en biochemische) vielen binnen de normale waarden.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: De TLV is vastgesteld naar analogie met cyclohexaan. De beschreven proef lijkt volgens de cie. deze waarde te onderschrijven.

Casnr: 108-91-8 Stofnaam: Cyclohexylamine
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	10	40			Ned: Ja		
USA	1992:	10	41			USA: Nee		
UK	1992:	10	40			UK: Ja		UK:
BRD	1992:	10	40	20C	80C	BRD: Nee		BRD:
Den	1992:	10	40			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -17.7 °C
BOILING POINT: 134.5 °C
VAPOR PRESSURE: 10 mm Hg (at 20 °C)
ODOR THRESHOLD: 10.4 mg/m3

2:TOXICOKINETICS: In contact with air, CHA is transformed in amine-carbonate crystals (DFG).

UPTAKE AND DISTRIBUTION: Accumulation occurs in the body (DFG).

BIOTRANSFORMATION: In humans a very small part is deaminated and excreted in the urine as cyclohexanol or trans-cyclohexane-1,2-diol (DFG, SCG). Rats and guinea pigs also transform little of the compound, but rabbits bio-transform about 30%. In rats there is primarily a ring hydroxylation; in rabbits and guinea pigs there is also a deaminization (DFG, SCG).

ELIMINATION: Plasma half-time in humans is 3.5 - 4.8 hours. About 85 - 97% is excreted unchanged in the urine, within two days after oral intake (DFG, SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): An air concentration of 40 mg/m3 was very irritating to the respiratory tract of experimental animals (SCG). Maximal tolerated concentration (single exposure) was circa 50 mg/m3 (DFG). Clinical symptoms include irritation of the mucous membranes, increasing stimulation of the central nervous system, restlessness, clonic convulsions.

SHORT TERM TOX: Exposure of rats at 100 mg/m3 (4 h/d; five months) resulted in changing body temperatures and decreased respiration rate, after 70 days diarrhea, albumiuria and neutrophilia. One animal (of twenty) died in the fourth exposure month (DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats and mice) = 200-800 mg/kg bw (DFG).

SHORT TERM TOX:

LONG TERM TOX: NEL in female mice (80 weeks) = 120 mg/kg (= omgerekend 552 mg/m3). Liver changes were seen in female mice, but not in male mice when fed 360 mg/kg bw cyclohexylamine.HCl for 80 weeks (= omgerekend 1656 mg/m3); In rats or dogs no liver changes were found in chronic experiments (SCG).

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): A 25% solution is very irritating to the skin.

SENSITIZATION (SK/RESP): A few reports state that the compound is weakly sensitizing (SCG, ACGIH).

ACUTE TOX: Concentrations over 40 mg/m3 cyclohexylamine (one hour) caused nausea and vomiting (SCG); short term exposure at 16-40 mg/m3 caused no symptoms in workers (ACGIH). A single oral dose of 5 to 10 mg/kg caused symphaticomimetic symptoms (roughly equivalent to 40 - 80 mg/m3).

SHORT TERM TOX:

LONG TERM TOX: Chronic toxicity (blood; kidneys; CNS) is expected in workers exposed to CHA containing an anti-rust compound (no exposure levels).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Human data allow no definite statements on the critical effect of cyclohexylamine. In animal studies the critical effect is irritation of the mucous membranes, respiratory tract and eyes. "This effect is probably due in part to the alkaline nature of the substance."

DFG: The MAK-Wert should be considered as a tentative limit, which needs further chronic experimental and field research.

ACGIH: Limit is set on "the pronounced toxic and irritant effects of CHA, and the possibility that continued absorption might lead to carcinogenic, mutagenic or teratological effects." Skin notation is deleted because "it was based on the local irritant effects to the skin from exposure to CHA."

Casnr: 287-92-3 Stofnaam: Cyclopentaaan
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	600	1720			Ned:		
USA	1992:	600	1720			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	300	850			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -94.4 °C

BOILING POINT: 49.3 °C

VAPOR PRESSURE: 400 mm Hg (at 31 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Cyclopentane is a central nervous system depressant (ACGIH) with a very small margin between narcosis and death (SCG).

3.1:IRRITATION (SK/MM/EY/RESP): Undiluted cyclopentane causes irritation and thickening of the skin and affected the arginase enzyme activity in the epidermis (SCG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Toxic symptoms (at high concentrations) include excitement, loss of equilibrium, stupor, coma (ACGIH). Inhalation of 0.2 ml was lethal for one of three anesthetized rats. The animal died of heart failure and asphyxiation.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "There are no toxicological or medical data which can provide a basis for establishing occupational exposure limits."

ACGIH: "It is believed that the 600 ppm TLV-TWA for cyclopentane is adequate to give occupational protection. Further releases of relevant information should be followed closely to clarify this question."

Casnr: 50-29-3 Stofnaam: DDT
Synoniemen: Dichlorodiphenyltrichloroethane

	tgg	Mg/m3	STEL		Huidno-	Carcino-	Sensibili-
	Ppm		Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	1			Ned:	Nee	
USA 1992:	-	1			USA:	Nee	
UK 1992:	-	1	-	3	UK:		UK:
BRD 1992:	-	1	-	10	BRD:	Ja	BRD:
Den 1992:	-	1			Den:	R40	
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 108 - 109 °C
VAPOR PRESSURE: 0.00000015 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: After ingestion, humans store DDT and DDE in higher concentrations in their fat than experimental animals do.

BIOTRANSFORMATION: DDT is converted via DDD and DDE to a number of other metabolites (NIOSH).

ELIMINATION: DDT is excreted primarily as DDA in the urine (NIOSH).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 250 mg/kg (ACGIH).

SHORT TERM TOX: At exposure levels below 10 ppm in gavage (10 days to 18 months), the major reported effects in rats are induction of hepatic enzymes (0.9 to 4 ppm; NEL = 0.5 ppm; = omgerekend 0.1 mg/m3) and behavioral changes (EL = 0.1 ppm (?; in table 4.3.2 it says 0.1 ppb!!) in drinking water, 8 weeks during and after pregnancy in mice; = omgerekend 0.1 mg/m3). In rabbits, 0.9 and 2.1 mg/kg bw/day caused immunosuppressive effects (= omgerekend 14 en 33 mg/m3) (NIOSH).

LONG TERM TOX:

CARCINOGENICITY: Mice, exposed to 2 ppm for lifetime (= omgerekend 7.6 mg/m3), showed a higher liver tumor incidence (hepatomas) (NIOSH, ACGIH). Tissue levels in these mice were comparable to or lower than those in occupationally exposed workers. DDT can also induce lung- and lymphatic tumors, in mice and rats, but (sofar) not in hamsters (NIOSH).

REPRODUCTION TOX: There is no reported evidence for teratogenicity in mammals. Studies showed equivocal effects on reproduction in rats; severe effects at a dietary levels of 50 - 100 ppm and 7 ppm, and normal reproductive performance at 200 ppm. In mice 1 mg/kg bw on day 10; 12 and 17 of gestation caused morphological changes in the gonads and reduction of fertility of offspring, especially females, although reproduction was reported to be normal at feeding levels of 25 ppm (= 2.5 mg/kg bw) or less (NIOSH).

OTHER STUDIES:

3.4:DERMAL: LD50 (rats) = 2500 mg/kg (ACGIH).

4:MUTAGENICITY: Bacterial mutagenicity tests were negative; DDT can cause chromosomal damage, both in vivo and in vitro, however.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Occupational exposure resulting in 14 - 42 mg absorbed DDT/day showed signs of irritation of eye and skin (NIOSH).

SENSITIZATION (SK/RESP):

ACUTE TOX: Estimated LD50 = 250 mg/kg; median dose for clinical effects is about 10 mg/kg (NIOSH); 16 mg/kg leads to convulsions (ACGIH).

SHORT TERM TOX: Exposure to 423 mg/m3 (one h/d; six days) caused only eye irritation (ACGIH).

LONG TERM TOX: Volunteers tolerate 35 mg/day without any ill effect detectable by them or by careful examination, but they do store DDT in their fat at an average of 281 ppm at this exposure level. These volunteers excrete DDA in a comparable amount (even lower) than occupationally exposed workers (ACGIH).

EPIDEMIOLOGICAL STUDIES: Exposed workers, who absorbed 18 - 42 mg/day, showed

only minor or equivocal clinical signs, but elevated activity of hepatic microsomal enzymes, higher blood pressure and serum cholesterol (NIOSH). No ill effects are reported from workers exposed up to 18 mg DDT/day for 11 - 19 years (ACGIH). Human data were inadequate to determine carcinogenic or teratogenic effects. Chromosomal aberrations in lymphocytes (exposure level equivalent to DDT intake of 6 - 27 mg/d for 2 months to 10 years) and reprotoxic effects (e.g. miscarriages) have been reported in exposed workers (NIOSH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

NIOSH: DDT should be considered a suspected occupational carcinogen. OEL be no higher than the lowest detectable concentration by the current method. Skin contact should be avoided.

ACGIH: TLV is set by analogy with lindane. It will prevent acute poisoning and significant accumulation in body stores.

Casnr: 8065-48-3 Stofnaam: Demeton
Synoniemen: Mercaptofos; Demox; Systox

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,01	0,1			Ned: Ja		
USA 1992:	0.01	0.11			USA: Ja		
UK 1992:					UK:		UK:
BRD 1992:	0,01	0,1	0,1	1	BRD: Ja		BRD:
Den 1992:	0,01	0,1			Den: Ja		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 134 °C at 2 mmHg.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Eenmalige blootstelling van ratten aan 3 mg/m3, gedurende 2 uur, veroorzaakte geen ziekteverschijnselen. Expositie aan 18 mg/m3 was letaal voor alle ratten, binnen 30 tot 90 minuten.

SHORT TERM TOX: Bij de tweede blootstelling van ratten aan 3 mg/m3, 2 uur per dag, ontstonden er tremoren; de derde dag ontstonden er heviger tremoren en tranende ogen; en tijdens de vierde expositie, stierven 10 van de 17 dieren.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (warmbloedigen) = 2,5-10 mg/kg.

SHORT TERM TOX: Voeding van ong. 0,05; 0,16; 1,1 en 2,6 mg/kg per dag aan vrouwelijke ratten, veroorzaakte in de laagste dosering al een geringe daling van de bloed- en hersencholinesterase-spiegel. Bij 1,1 mg/kg was deze daling al opgelopen tot 85%, hoewel systemische effecten uitbleven. In de hoogste dosering werden de dieren behoorlijk ziek (MAEL = omgerekend 0,23 mg/m3).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 van warmbloedige dieren = 8,2-14,0 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie met parathion, wat een vergelijkbare acute orale en dermale toxiciteit heeft.

Casnr: 128-37-0 Stofnaam: Di-tert-butyl-p-cresol (2,6-)
 Synoniemen: 2,6-Bis(1,1-dimethylethyl)-4-methylphenol; Butylated hydroxytoluene

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:		10			Den:		
Zwed	1990:					Zwed:		Zwed:

1: PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 70 °C

BOILING POINT: 265 °C

2: TOXICOKINETICS: BHT is a radical scavenger and used as an antioxidant (DFG).

UPTAKE AND DISTRIBUTION: Some BHT is deposited in the body fat (DFG).

BIOTRANSFORMATION: Probably there is an enterohepatic cycle in humans (of the metabolite BHT-COOH and his glucuronide?). Exact biotransformation is yet unknown (DFG).

ELIMINATION: 54% of a single oral dose was detected in the urine of rabbits as various metabolites (ACGIH). One-third of an orally administered dose (40 mg) was found in the urine of humans, within 24 hours; two-third within 11 days (DFG).

3: ANIMAL EXPERIMENTS:

3.1: IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2: INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3: ORAL:

ACUTE TOX: LD50 (rat; cat; mice; guinea pig and rabbit) = respectively 1700 - 2450; 940 - 2100; 2000; 10700 and 2100 - 3200 mg/kg (DFG, ACGIH). LAEL was 40 mg/kg in mice. Pathologic findings were hyperplasia and hypertrophy of the lungs, with thickening of the intra-alveolar septa, indicating inflammatory processes (DFG).

SHORT TERM TOX: Rats fed respectively 14 days; 600 mg/kg en 40 days; 350 mg/kg showed bleedings and hemorrhages in various organs and several animals died.

LAEL in rats was 8.5 mg/kg/day (effect was a serious decrease (86%) in prothrombine index). At 25 mg/kg (26 days) there was an increase in thyroid weight in rats. Monkeys, receiving 500 mg/kg for 28 days showed histological and biochemical changes in the liver, other species showed functional and histologic changes in thyroid, liver and kidneys when exposed in sub-acute tests. Feeding mice 750 mg/kg for one year caused cholangitis. Daily 0,17 tot 0,9 g/kg BHT for one year did not reveal any adverse effects (histologic examination included) (ACGIH).

LONG TERM TOX: Feeding mice 300 mg/kg for 108 weeks showed histopathological changes in the liver. Rats fed 125 mg/kg for 104 weeks showed a decrease in spleen weight, leucocyte count and body weight gain, and an increase in liver weight (DFG), although in another 24 months study, NEL was 400 mg/kg in rats (ACGIH). When rats were given a diet rich in fat, 50 mg BHT/kg caused a decrease in general growth and an increase in liver weight (ACGIH). NEL of 25 mg/kg for rats was reported (ACGIH).

CARCINOGENICITY: Various studies with rats and mice have been performed. Several had positive outcomes, others were negative or inconclusive. Used feed concentrations in "positive" tests varied from 100 to 375 mg/kg. Some authors concluded that BHT did not have carcinogenic properties, others stated that it was a tumorpromoter. It has also anticarcinogenic properties. The lowest effective concentrations of both properties lies in the same range (about 300 mg/kg bw). In general, it depends on the order of administration of both BHT and a carcinogenic, which property predominates.

REPRODUCTION TOX: Reproductive disorders have been described; anophthalmia, reduced litter size and development disorders in mice (no further data). Other studies could not confirm these results.

OTHER STUDIES:

3.4: DERMAL:

4: MUTAGENICITY: Amest tests and other cytogenetic tests were negative,

induced-DNA-reparation was inhibited by BHT and a mice-sperm test was positive.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP): In a sensibilization test, three of 112 persons with eczema developed a positive reaction with BHT. There is a report of another positive test, with combined exposure to BHT and BHA (DFG).

ACUTE TOX:

SHORT TERM TOX: Nine of fifty volunteers developed an unspecific contactdermatitis after exposure to BHT (DFG).

LONG TERM TOX: ADI is 0.5 mg/kg (DFG).

EPIDEMIOLOGICAL STUDIES: Mean daily intake = about 2 ppm; this should correspond with circa 0.2 mg/kg bw (ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: MAK-Wert can not be deduced from the toxicological data available.

ACGIH: BHT is wide spread; used in food processing; little toxic in animals and (seemingly) humans, so TLV is set on 10 mg/m3.

Casnr: 19287-45-7 Stofnaam: Diboraan
Synoniemen:

tgq			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 0,1	0,1			Ned:		
USA	1992: 0.1	0.11			USA:		
UK	1992: 0.1	0.1			UK:		UK:
BRD	1992: 0,1	0,1	0,2C	0,2C	BRD:		BRD:
Den	1992: 0,1	0,1			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -165 °C.

BOILING POINT: -92.5 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Irriterend op de luchtwegen, resulterend in longoedeem.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (4 uurs expositie) (albino rat) = 40 - 80 ppm.

Toxiciteit neemt af met de leeftijd.

SHORT TERM TOX: Herhaalde blootstellingen, gedurende 6 maanden, van ratten en honden aan 1-2 ppm; en aan 5 ppm resulteerden in beide gevallen in hoge mortaliteit; in de laagste concentratie stierf nog 50% van de dieren; bij 5 ppm stierf bijna 100% van de dieren. Er werden geen eenduidige veranderingen in de longen aangetroffen bij sectie, maar er werd aangenomen dat herhaalde beschadigingen van de longen de achterliggende oorzaak was van de sterfte; honden, blootgesteld aan 5 ppm, vertoonden klinische tekenen van infectie van de longen. (Laboratoriumratten zouden sowieso al vaak longafwijkingen vertonen, zodat er moeilijk verschillen aan te wijzen zijn met controlegroepen.) Van cavia's, die aan 1-2 ppm werden blootgesteld, stierf er geen een.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Er zijn effecten gevonden die geweten worden aan veranderingen in het CZS bij dieren. Blootstellingsroute is onbekend, evenals dosering.

Herhaalde (?) blootstelling van een hond resulteerde in anatomische lesies in het ruggemerg.

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Er zijn gevallen beschreven van intoxicaties van het nerveuze systeem tgv expositie aan diboraan.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is afgeleid van de sub-chronische proef met de ratten, honden en cavia's. Men verwacht hiermee een acute intoxicatie van de longen, en cumulatieve effecten op het CZS te voorkomen.

Casnr: 300-76-5 Stofnaam: Dibroom-2,2-dichloorethyldimethylfosfaat(1,2)
Synoniemen: Naled; Bromchlophos

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							Nee
Ned	1994:	-	3			Ned:	
USA	1992:	-	3			USA: Ja	
UK	1992:	-	3	-	6	UK:	UK:
BRD	1992:	-	3	-	30	BRD:	BRD:
Den	1992:					Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 25 °C.

BOILING POINT: 110 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Cavia's en ratten, gedurende 5 weken; 5 d/w; 6 u/d blootgesteld aan een aerosol, van 65% naled; 25% xyleen en 10% emulgator-surfactant, vertoonden effecten vanaf een concentratie van 42 mg/m3 en hoger. Bij deze concentraties was er sprake van een verlaagde cholinesterase-activiteit, inactiviteit van de dieren en duidelijk ongemak.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 250 mg/kg.

SHORT TERM TOX: Ratten, die gedurende 27 dagen 30 ppm gevoerd werden, vertoonden geen daling in plasma-, erythrocyten- of hersen-cholinesterase (omgerekende NEL = 7 mg/m3).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rat) = 800 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

SENSITIZATION (SK/RESP): Expositie aan Naled resulteerde in een contact-allergische dermatitis, zich uitend in een papulaire dermatitis van de arm; glazig worden van de wanghuid, milde irritatie van de nekhuid en een maculopapulaire uitslag op de buikhuid.

IRRITATION (SK/MM/EY/RESP): Dermatitis werd beschreven na het plukken van bloemen die met Naled waren behandeld en bij een piloot van een spuitvliegtuigje die met Naled had gespoten. Hier ontstonden blaren die later gingen jeuken.

ACUTE TOX: Symptomen zijn oa buikkrampen, braken, misselijkheid, hypersecretie, hoesten en zweten; deze zijn na 2 dagen verdwenen, terwijl benauwdheid, depressie, duizeligheid en spontane horizontale nystagmus tot 4 maanden nadien nog aanwezig waren.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de aanwezige gegevens en naar analogie met DVP.

Casnr: 75-61-6 Stofnaam: Dibroomdifluormethaan
Synoniemen: Difluordibroommethaan; Freon 12B2; DFBM

tgg			STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	100	860			Ned:		
USA 1992:	100	858			USA:		
UK 1992:	100	860	150	1290	UK:		UK:
BRD 1992:	100	860	200	1720	BRD: Nee		BRD:
Den 1992:	100	860			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -141.7 °C
BOILING POINT: 24.5 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): De letale concentratie voor expositie gedurende 15 min. bij ratten is 55.000 ppm. Expositie gedurende 15 minuten aan 4000 ppm resulteerde bij ratten in longschade, irritatie en oedeem. Decompositieproducten, ontstaan na contact met ijzer bij 800 graden Celsius, verhoogde de acute toxiciteit naar 1870 ppm.
SHORT TERM TOX: Van ratten en honden, gedurende 6 weken dagelijks blootgesteld aan 2300 ppm, stierf meer dan de helft van de ratten en vertoonden de honden snelle en progressief verlopende symptomen van intoxicatie, met zwakte en evenwichtsverlies na een paar dagen expositie. Bij sectie werden er diffuse longbloedingen, leverschade en schade aan het CZS gevonden. Dagelijkse expositie aan 350 ppm, gedurende 7 maanden, had bij ratten en honden geen effecten tot gevolg.

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: De TLV wordt geacht voldoende laag te zijn om effecten in de mens te voorkomen.

Casnr: 102-81-8 Stofnaam: Dibutylaminoethanol (2-N-)
Synoniemen: N,N-di-n-butylaminoethanol; DBAE

	tgg	Mg/m3	STEL	Huidno-	Carcino-	Sensibili-
	Ppm		Ppm	tatie	geen	serend
Ned 1994:	2	14		Ned: Ja	Nee	
USA 1992:	2	14		USA: Ja		
UK 1992:				UK:		UK:
BRD 1992:				BRD:		BRD:
Den 1992:	2	14		Den: Ja		
Zwed 1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT:? (according to the documentation, the compound is a liquid; vapor pressure is 0.1 mmHg at 20 °C).
BOILING POINT: 224 to 232 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Ratten, gedurende 5 dagen; 6 u/d blootgesteld aan 70 ppm vertoonden sterfte (1x); toename in hematocriet en serumbilirubine; lichte verlenging van de stollingstijd; toegenomen lever- en niergewichten en lichaamsgewichtsverlies van gemiddeld 54% ; 33ppm resulteerde in 3% gewichtsverlies; geen veranderingen in lever- en niergewichten een lichte verlenging van de stollingstijd en geen veranderingen in hematocriet en serumbilirubine. Blootstelling aan 22 ppm gedurende 27 weken; 5d/w; 6 u/d, veroorzaakte geen veranderingen in deze zelfde parameters.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTIONTOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (ratten) = 1,78 g/kg.

SHORT TERM TOX: NEL (effect = gewichtsverlies) = 0,13 g/kg/dag gedurende 5 weken bij mannelijke ratten (omgerekende NEL = 910 mg/m3). Bij hogere doseringen (0,33 en 0,43 g/kg/dag) trad er voor het aanvankelijke gewichtsverlies, gewenning op, zodat de groeicurves na verloop van tijd parallel met die van controledieren liepen. In de hoogst gedoseerde groep was er nadat de dieren opgeofferd waren, sprake van een verhoogde verhouding nier-/lichaamsgewicht. Er waren geen histologische veranderingen te vinden.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 (ip) = 0,14 g/kg (ratten).

3.4:DERMAL: LD50 (konijn) = 1,68 g/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Bij de vaststelling van de TLV werd in overweging genomen dat diethanolamine 10x zo toxisch is als DBAE. De TLV van DEA (10 ppm) is vastgesteld op grond van zijn irriterende eigenschappen. De NEL van DBAE wordt op 22 ppm gesteld. Dit alles overwegende werd de TLV 2 ppm. Geen rekening is gehouden met eventuele irriterende eigenschappen van DBAE op dit niveau, vanwege gebrek aan gegevens hierover.

Casnr: 107-66-4 Stofnaam: Dibutylfosfaat
Synoniemen: Dibutyl hydrogen phosphate

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	5			Ned:		
USA	1992:	1	8.6	2	17	USA:		
UK	1992:	1	5	2	10	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	1	8,6			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: decomposes above 100 °C. The compound is a liquid.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Werknemers die aan relatief lage concentraties (?) hebben blootgestaan, klaagden over irritatie van de luchtwegen en hoofdpijn.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Geen motivatie voor de TLV.

Casnr: 594-72-9 Stofnaam: Dichloor-1-nitroethaan (1,1-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	2	10			Ned:		
USA	1992:	2	12			USA:		
UK	1992:					UK:		UK:
BRD	1992:	10	60			BRD:		BRD:
Den	1992:	2C	12C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 124 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na 2 applicaties op twee opeenvolgende dagen, ontstond er een duidelijke zwelling met irritatie op de huid (diersoort??). Blootstelling aan de stof in dampvorm in een concentratie van 25 ppm, was niet irriterend, noch voor de ogen, noch de huid, noch de mucosa.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Blootstelling van konijnen en cavia's aan 100 ppm gedurende 6 uur was letaal; aan 60 ppm gedurende 2 uur; en aan 34 ppm gedurende 4 uur was niet letaal. Bij de gestorven dieren waren de lever (hydropische degeneratie), het hart (acute degeneratie van het myocard) en de nieren (tubulus degeneratie en interstitieel oedeem; oedeem van de glomeruli en necrosehaarden) afwijkend.
SHORT TERM TOX: Blootstelling aan 25 ppm gedurende 6 uur per dag, 34 dagen lang, was niet letaal voor cavia's en konijnen. In het geval er afwijkingen optraden (= onduidelijk) was het targetorgaan de longen; met oedeem, bloedophopingen, bloedingen, en acute bronchitis.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is, rekening houdend met bovenstaande gegevens, vastgesteld op 2 ppm, zolang er nog geen verder onderzoek bekend is.

Casnr: 118-52-5 Stofnaam: Dichloor-5,5-dimethylhydantoin (1,3-)
Synoniemen: Dactin; Halane; DCDMH

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,2			Ned:		
USA	1992:	-	0.2			USA:		
UK	1992:	-	0.2	-	0.4	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,2			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 132 °C, sublimes at 100 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat)= 542 +/- 84 mg/kg in een 10% waterige suspensie. Bij de gestorven dieren waren er bloedingen van het maagdarmkanaal te zien. Oplossingen DCDMH met 20 ppm beschikbaar chloor, werden door ratten getolereerd.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Mensen, blootgesteld aan gemiddelde concentraties van 1,97 mg/m3 (range 0,7-3,4 mg/m3) ondervonden een extreme irritatie van de luchtwegen.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld na omrekening van de aanbevolen limiet bij het gebruik in zwembaden van 10 ppm. Er is een veiligheidsfactor aangehouden van 2,5.

Casnr: 7572-29-4 Stofnaam: Dichlooracetyleen
Synoniemen:

	tgq		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	0,1C	0,4C			Ned:		
USA 1992:	0.1C	0.39C			USA:		
UK 1992:			0.1	0.4	UK:		UK:
BRD 1992:	-	-	-	-	BRD:	IIIA2	BRD:
Den 1992:	0,1C	0,4C			Den:	R40	
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -68 to -64.2 °C

BOILING POINT: 32 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 in guinea pigs (four hours exposure) was approximately 20 ppm (ACGIH). DCA is very nephrotic for animals; critical effect is kidney damage (DFG).

SHORT TERM TOX: Rats were exposed at 2.8; 9.8 and 15.5 ppm DCA (6 h/d; 5 d/w; 6 weeks) in mixtures with respectively 3.2; 50 and 150 ppm trichloroethylene (in order to get a stable DCA. NEL of trichloroethylene in rats (7 h/d; 173 times in 205 days) is > 200 ppm but < 400 ppm. in: DECOS report about trichloroethylene. Ra 3/83). NEL was 9.8 ppm DCA. When the animals were exposed 24 hours a day; for 90 days at 2.8 ppm DCA (the same mixture), they developed kidney changes (DFG).

LONG TERM TOX:

CARCINOGENICITY: Mice and rats were exposed at respectively 9 and 14 ppm stabilized DCA (DCA:acetylene = 1:2); 6 hours a day; twice respectively once a week; for 12 months. The animals developed a significantly increased incidence of cystadenomas of the proximal tubes of the kidney; rats developed also cholangiomas; mice also cystadenomas of the gland of Harder while only male mice developed cystic adenocarcinomas of the kidneys (DFG).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Ames test (TA 100) with unstabilized DCA was positive; DCA mixture with acetylene (which is an asphyxiant) as stabilizer was negative (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: (Fatal) intoxication start with headache, nausea, vomiting and loss of appetite. This results in irreversible paralysis of the trigeminal - and other cranial nerves. Autopsy showed edema at the base of the brain. Other organs showed no histologic changes (DFG, ACGIH).

SHORT TERM TOX: At least 85% of individuals, exposed at 0.5 to 1 ppm DCA for prolonged periods, experienced disabling nausea (ACGIH).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: DCA has carcinogenic potential in rats and mice. A carcinogenic IIIA2 notation is given, whereas no MAK can be set.

ACGIH: "A ceiling limit not heigher than 0.1 ppm appears necessary to prevent disabling nausea and other more serious systemic effects. Whether

this TLV is low enough to provide adequate protection against prolonged occupational exposure is uncertain."

Casnr: 78-87-5 Stofnaam: Dichloorpropaan (1,2-)
 Synoniemen: Propyleendichloride

		tg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	75	350			Ned:		
USA	1992:	75	347	110	508	USA:		
UK	1992:					UK:		UK:
BRD	1992:	-	-	-	-	BRD:	IIIB	BRD:
Den	1992:	75	350			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -100.44 °C (solidifies below -70 °C)

BOILING POINT: 95-96 °C

VAPOR PRESSURE: 40 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rat)= 3000 ppm (8 uurs blootstelling).

SHORT TERM TOX: Bij herhaalde blootstelling aan 1000 ppm, (gedurende 7 uur) trad sterfte op bij ratten na 7x; bij honden na 24x en bij cavia's na 22 exposities. De belangrijkste pathologische bevinding was ernstige leverschade. Bij blootstelling aan 400 ppm; 7u/w; 5d/w; 28 weken, werden er geen histopathologische veranderingen aangetroffen bij deze drie diersoorten. Een zelfde serie blootstellingen aan 400 ppm was echter letaal voor muizen waarbij de overlevenden hepatomen vertoonden.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 1,19 ml/kg.

SX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Humaan??: Propyleendichloride is mild irriterend voor de huid. Onverdunde oplossingen zijn matig irriterend voor de ogen, maar veroorzaken geen serieuze of permanente beschadigingen.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het oordeel van een van de geciteerde auteurs. Wel wordt aangegeven dat een herbeschouwing nodig zou zijn, ivm de ingrijpend veranderde normen voor hepatotoxische gehalogeneerde stoffen.

Casnr: 141-66-2 Stofnaam: Dicrotophos
 Synoniemen: Dimethyl cis-2-dimethyl-carbamoyl-1-methylvinyl phosphate; etc.

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,25			Ned: Ja		
USA	1992:	-	0.25			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,25			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 BOILING POINT: 400 °C at 1 atm.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Dicrotophos wordt gemetaboliseerd op dezelfde manier als monomicrotophos; (waarschijnlijk wordt bedoeld; monocrotophos) nl. uitscheiding voor ong. 70% via de urine, met als belangrijkste metabolieten, de hydrolyseproducten. Ongeveer 5% van monocrotophos werd met de faeces uitgescheiden.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Blootstelling van ratten aan 910 mg/m3; en 2,12 mg/l technische; of 2,12 mg/l van een 38% opl. (= equ. aan 813 mg/m3 technische stof), gedurende een uur, resulteerde in ziekteverschijnselen die vlot na einde van de expositie verdwenen.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 16-22 mg/kg (2 ref.)

SHORT TERM TOX:

LONG TERM TOX: Ratten, die gedurende 2 jaar, 1 ppm gevoerd kregen, vertoonden geen effecten (omgerekende NEL = 0,23 mg/m3). Bij 10 en 100 ppm, waren er afnames in lichaamsgewicht en cholinesterase-spiegels. Honden, die gedurende 2 jaar 0,16; 1,6; en 16 ppm (omgerekend resp. 0,0129; 0,129 en 1,29 mg/m3) gevoerd kregen, vertoonden af en toe verhoogde speekselvloed. Verder waren er geen veranderingen, behalve in de hoogst gedoseerde groep, waar de erythrocyten- en plasma-cholinesterasespiegel verlaagd was.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: In de "standard chicken test" trad geen demyelinisatie op.

3.4:DERMAL: LD50 (rat) = 42 mg/kg; (konijn) = 224 mg/kg. Dicrotophos dringt door de huid naar binnen, maar lijkt zich niet op te hopen.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de gegeven data en naar analogie met vergelijkbare stoffen.

Casnr: 460-19-5 Stofnaam: Dicyaan
Synoniemen: Cyanogen, Oxalonitrile

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	10	20			Ned:		
USA	1992:	10	21			USA:		
UK	1992:	10	20			UK:		UK:
BRD	1992:	10	22	50	110	BRD: Ja		BRD:
Den	1992:	10	20			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -27.9 °C

BOILING POINT: -20.7 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Blootstelling van katten aan 100 ppm, was letaal binnen 2-3 uur, en aan 50 ppm gedurende 4 uur veroorzaakte ernstige, maar reversibele verschijnselen. Bij konijnen veroorzaakte 400 ppm binnen 2 uur sterfte, maar 100 ppm gedurende 4 uur, was praktisch zonder effecten.

Rattenproeven leidden tot de conclusie dat dicyaan 10 x minder acuut toxisch is dan waterstofcyanide.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Oogirritatie en neusirritatie treden op bij een blootstelling aan 16 ppm. Irritatie bleef nog een tijdje voortduren na beëindiging van de expositie. De reukgrens ligt bij 250 ppm.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie met waterstofcyanide. De waarde zou voldoende laag zijn om irritatie en systemische effecten te voorkomen.

Casnr: 111-42-2 Stofnaam: Diethanolamine
Synoniemen: 2,2'-Iminodiethanol

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	3	15			Ned:	Nee	
USA	1992:	3	13			USA:		
UK	1992:	3	15			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	3	15			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 28 °C
BOILING POINT: 268.8 °C
VAPOR PRESSURE: < 0.01 mm Hg

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: After oral intake, diethanolamine is well absorbed. It replaces monoethanolamine or choline as components in liver phospholipids. These aphysiologic phospholipids can accumulate in the body (DFG).

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The liquid irritate the skin (repeated exposures) and eyes of rabbits.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Exposure of rats at 6 ppm diethanolamine (7-8 h/d; 5 d/w; 13 weeks) caused changes in growth rate, increases in liver- and lung weight and some deaths (DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 in rats and guinea pigs is respectively 772-3,540 mg/kg and about 2 g/kg (DFG, ACGIH).

SHORT TERM TOX: Daily minimal lethal dose in rats (oral; for 90 days) is 170 mg/kg. NEL in a 3 months feeding study with rats is between 20 and 90 mg/kg bw (DFG, ACGIH). First noticed effect is increase in liver- and kidney weight (DFG).

LONG TERM TOX:

CARCINOGENICITY: Diethanolamine can react with nitrites or other nitrosing compounds to form nitrosamines. These diethanolnitrosamines are carcinogenic in animals; in rats it causes liver tumors after a total oral intake of 30-150 g/kg in a period of 242-300 days. In goldhamsters, nose- and pharynx tumors occur after circa 300 days and a total sc dosis of about 15 g diethanolnitrosamine/kg (DFG).

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 in rabbits is 13 g/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): The compound should irritate eyes and skin.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: There are no occupational data on which to base a MAK-Wert. The effect level of 6 ppm in the subchronic experiment can not help in recommending a MAK. Long term inhalation experiments are needed to set a good underpinned MAK.

ACGIH: "TLV is derived from the three months feeding study, applying a safety factor of ten, and by analogy with ethanolamine".

Casnr: 111-40-0 Stofnaam: Diethyleentriamine
Synoniemen: 2,2'-Iminodi(ethylamine)

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	4			Ned: Ja		
USA	1992:	1	4.2			USA: Ja		
UK	1992:	1	4			UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	1	4			Den: Ja		
Zwed	1990:	1	4,5	2	10	Zwed: Ja		Zwed: Ja

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -39 °C
BOILING POINT: 207 °C
VAPOR PRESSURE: 0.225 mm Hg

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: "Amino oxidases are found in the liver, kidneys, intestines etc. of mammals" (SCG).
BIOTRANSFORMATION: "The primary biotransformation products are various carboxyl acids and urea" (SCG).
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Rats survived a single eight hour exposure at 300 ppm.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 in the rat is 1080 mg/kg.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: LD50 ip is 71 mg/kg (mouse) and 74 mg/kg (rat).

3.4:DERMAL: LD50 rabbit is 1090 mg/kg.

4:MUTAGENICITY: Ames tests were positive, independent of metabolic activation (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): 5% Solutions caused minor corneal injury (ACGIH).
SENSITIZATION (SK/RESP): DETA is a well known and relatively high frequent skin- (SCG, ACGIH) and respiratory sensitizer (ACGIH).
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "Critical effect seems to be allergic contact eczema". The compound has a mutagenic effect.
ACGIH: TLV is derived from the TLV of ethylamine, taken into account that the latter has a smaller irritating and sensitizing potential.

Casnr: 96-22-0 Stofnaam: Diethylketon
Synoniemen: Pentaan-3-on; 3-Pentanon

tgg			STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994: 200	705			Ned:	Nee	
USA	1992: 200	705			USA:		
UK	1992: 200	700	250	875	UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992: 200	700			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
FREEZING POINT: -42 °C
BOILING POINT: 101 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): A four hour exposure at 8000 ppm killed four of six rats.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 for rats is 2.14 g/kg (omgerekend LC50 = 10.000 mg/m3).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The same TLV as for its isomer methyl propyl ketone is suggested, bases on the fact that toxicities of the methyl ketones generally increase with increasing molecular weight.

Casnr: x Stofnaam: Difenyl/fenylether-mengsel
 Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	7			Ned:		
USA	1992:					USA:		
UK	1992:					UK:		UK:
BRD	1992:	1	7			BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Geen TLV onderbouwing

Casnr: 108-18-9 Stofnaam: Diisopropylamine
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5	20			Ned: Ja		
USA	1992:	5	21			USA: Ja		
UK	1992:	5	20			UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	5	20			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -96.1 °C
BOILING POINT: 84 °C
VAPOR PRESSURE: 60 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake by the respiratory passages, skin and digestive tract (SCG).
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): It is a strong eye irritant for rabbits.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure at 3100 mg/m3 was not lethal for experimental animals; 4000 mg/m3 was lethal for two of six rats (SCG).
SHORT TERM TOX: Exposure at 2400 mg/m3 (7 h/d; 40 exposures in 54 days) was fatal for all rabbits and 50% of the guinea pigs, whereas all exposed cats and rats survived (ACGIH).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 in rats is 770 mg/kg body weight (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Diisopropylamine was mutagenic (with and without metabolic activation) in three bacterial strains. The authors however suggest that there were disturbing factors present in the study, because this outcome was very unexpected (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Exposure at 100-200 mg/m3 with brief (5-10 minutes) peaks of 740 mg/m3 resulted in corneal edema, nausea and headache (SCG, ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "Available data are sparse and exposure levels uncertain". "The critical effect is irritation of the eyes, mucous membranes and respiratory passages. The effect is probably caused by the strong alkalinity of the substance".
ACGIH: The acute toxicity of diisopropylamine is considerably greater than that of isopropylamine, diethylamine and ethylamine. "Industrial experience indicates that a TLV-TWA of 20 mg/m3 should provide a reasonable margin of safety against disturbance of vision, as well as irritation of respiratory passages."

Casnr: 108-20-3 Stofnaam: Diisopropylether
Synoniemen: Isopropyl ether

tgg			STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994: 250	1050			Ned:	Nee	
USA	1992: 250	1040	310	1300	USA:		
UK	1992: 250	1050	310	1320	UK:		UK:
BRD	1992: 500	2100			BRD:		BRD:
Den	1992: 250	1050			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -60 °C

BOILING POINT: 68 to 69 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De vloeistof is irriterend voor mucosae en herhaalde applicatie op de huid veroorzaakte dermatitis.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Toxische effecten zijn narcose en sterfte.

SHORT TERM TOX: Dieren die 20 keer blootgesteld waren aan een dampconcentratie van 1%, vertoonden tekenen van intoxicatie en depressie, maar hadden geen significante veranderingen in gewicht of bloedparameters. Twintig exposities van 3 uur aan een dampconcentratie van 0,1 % (= 1000 ppm), sorteerden geen schadelijk effect.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: De minimale letale dosis voor konijnen is 5-6,5 g/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Blootstelling aan 500 ppm, gedurende 15 minuten werd niet als irriterend ervaren, terwijl 800 ppm gedurende 5 minuten bij de meeste vrijwilligers irritatie aan neus en ogen veroorzaakte. Bij 300 ppm waren er al klachten van stank.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de beperkte humane gegevens.

Casnr: 109-87-5 Stofnaam: Dimethoxymethaan
 Synoniemen: Methylal; N,N-Dimethoxymethaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1000	3100			Ned:		
USA	1992:	1000	3110			USA:		
UK	1992:	1000	3100	1250	3880	UK:		UK:
BRD	1992:	1000	3100			BRD:		BRD:
Den	1992:	1000	3100			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 MELTING POINT: -104.8 °C
 BOILING POINT: 42.3 °C

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:
 ACUTE TOX (LOC/SYST): Dieren blootgesteld aan hoge concentraties ontwikkelden vaak ernstige vettige veranderingen in de lever, nieren en hart en ontstekingen in de longen. Lagere(?) concentraties veroorzaakten iha geen pathologische veranderingen. LC50 (muizen en cavia's) = ong. 18.000 ppm (7 uren blootstelling). Toxiciteitsdrempel = 11.300 ppm.
 SHORT TERM TOX: Acht exposities van 6 uur van ratten aan 4000 ppm veroorzaakten geen effecten.
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION (SK/RESP):
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de geringe acute toxiciteit van methylal. Een onderzoeker, die de ratten acht keer blootstelde, vond de TLV ook wel goed.

Casnr: 121-69-7 Stofnaam: Dimethylaniline (N,N-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5	25			Ned: Ja		
USA	1992:	5	25	10	50	USA: Ja		
UK	1992:	5	25	10	50	UK: Ja		UK:
BRD	1992:	5	25	10	50	BRD: Ja	IIIB	BRD:
Den	1992:	5	25			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 2.5 °C
BOILING POINT: 192.5 - 194 °C
VAPOR PRESSURE: 0.5 mm Hg (at 20 °C)
ODOR THRESHOLD: 0.065 mg/m3

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake via lungs and skin (SCG, ACGIH).
BIOTRANSFORMATION: In the liver, lungs, small intestines, kidney, heart and (in the rat) the nasal mucosa. Metabolic pathways consist of N-demethylation (main pathway in animals); N-oxidation (main pathway in humans); or ring hydroxylation (SCG, DFG).
ELIMINATION: In dogs the original compound and metabolites (especially the glucuronide conjugate) are excreted in the urine (SCG, DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): It irritates the skin and eyes (undiluted solution) (SCG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Rats that were exposed at 1 and 10 mg N,N-dimethylaniline/m3 (5 h/d; 6 d/w; four months). showed increase in Methb-level (up to 12%) and peroxidase activity (30% increase), decrease in hemoglobin level (up to 8.8%), in hematocrit and in katalase activity (50% reduction). Symptoms were more explicit in the highest exposure group. In this group also liver function disturbances, dysproteinaemia and hyperplasia of the lymphatic tissue in the spleen were reported (DFG). In another study (24 h/day; 200 days), NEL in rats was 0.05 mg/m3 (SCG, DFG). SCG called this study questionable and "with extremely uncertain results". At 0.3 mg/m3 there were changes in the blood, the liver and CNS.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats and mice) is respectively 1.05-1.35 and 1.4-1.5 g/kg body weight. Single oral dose of 30 mg/kg bw caused Methb in dogs (ACGIH).
SHORT TERM TOX: Intragastric application of 31 mg/kg bw or more in mice and rats (5 d/w; 13 weeks; 10 ml N,N-dimethylaniline/kg maize-oil) (= omgerekend 102.3 en 83.7 mg/m3) caused effects on body weight (reduction in males), splenomegaly and several dose-related histopathologic changes as a result from intravascular hemolysis and increased erythrocyte-phagocytosis. Rats were more susceptible to the toxicity of N,N-dimethylaniline than mice (DFG).

LONG TERM TOX:

CARCINOGENICITY: In an intragastric carcinogenicity study with rats and mice (0; 3 or 30 respectively 0; 15 or 30 mg/kg bw; 5 d/w; 103 weeks) the compound induced only in 10% of the male rats carcinomas (four sarcomas; three of the spleen and one of the thymus, and one osteosarcoma of the spleen). In female rats and in mice there were no tumors found. In the highest dose group of the rats other effects as fibrosis and fatty degeneration of the spleen and topical inflammation of the liver were seen (DFG).
REPRODUCTION TOX: There were no effects on survival or weight gain in offspring of mice after oral doses of 365 mg/kg bw on days 6 to 13 of gestation (SCG, DFG).

OTHER STUDIES:

3.4:DERMAL: LD50 in rabbits (24 hours application) is 1.69 g/kg (SCG, DFG).

4:MUTAGENICITY: N,N-Dimethylaniline was found positive in an Ames test with strain TA 98 only after metabolic activation and in the presence of norharman (which is a mutagen itself) (SCG, DFG). The Ames tests with other

strains were negative (SCG, DFG). In vitro tests on mammalian cells showed chromosomal aberrations and sister chromatid exchange after metabolic activation. At the highest dose (toxic dose of 830 µg/ml) chromosomal aberration occurred also without metabolic activation. N,N-Dimethylaniline was negative in a DNA repair test (SCG, DFG). A test to induce resistance for trifluorothymidin was positive, with and without metabolic activation (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: The lowest oral lethal dose is 50 mg/kg (SCG).

SHORT TERM TOX:

LONG TERM TOX: In a long term occupational exposure study, an increase in methemoglobin level (up to 5.2%), erythropenia and reticulocytose were detected, but no influence on the katalase and peroxidase activity in the blood were determined (DFG).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "There is no scientific basis for an occupational exposure limit."

DFG: "A MAK cannot be underpinned because human data are lacking". MAK is based on analogy with and compared to the MAK of aniline.

ACGIH: In view of the seriousness of the health hazards "it would appear reasonable to limit the exposure to dimethylaniline to a TLV-TWA of 5 ppm and a STEL of 10 ppm". They implicate the toxicity of aniline in this recommendation.

Casnr: 598-56-1 Stofnaam: Dimethylethylamine
Synoniemen: N,N-Dimethylethylamine

	tg	gg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	tatie	geen	serend
Ned 1994:	10	30		Ned:	Nee	
USA 1992:				USA:		
UK 1992:	10	30	15	UK:		UK:
BRD 1992:	25	75	50C	BRD:		BRD:
Den 1992:	25	75	150C	Den:		
Zwed 1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -140 °C

BOILING POINT: 37 °C

VAPOR PRESSURE: 414 mm Hg (at 20 °C)

ODOR THRESHOLD: 0.023 mg/m3 (SCG); 3 mg/m3 (HSE).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Well absorbed by the lungs (SCG, HSE).

BIOTRANSFORMATION: Dimethylethylamine is biotransformed to dimethylethylamine-N-oxide, mostly in the liver.

ELIMINATION: The compound is excreted mainly in the urine in the original- or the oxide-form in a two-phase elimination, with half times of 1.5 and 7 hours for the amine and 2.5 and 8 hours for the oxide (SCG). A very limited part is excreted by the lungs.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: "In a rodent inhalation study, a depressed body weight-gain was recorded at 1620 mg/m3." Other effects were irritation to the skin, and eyes (HSE).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure at 80-160 mg/m3 for 15 minutes and occupational exposure to 47 mg/m3 (eight hour average) (SCG, HSE) with peaks of 125 mg/m3 caused respectively eye irritation (reversible corneal edema) and irritation of the eyes and nose.

SENSITIZATION (SK/RESP):

ACUTE TOX: NEL (8 hour exposure) was 10-20 mg/m3 (critical effect was eye irritation).

SHORT TERM TOX:

LONG TERM TOX: Workers who were exposed at 1.2 to 2.3 mg/m3 (8-hour average, stationary sampling) developed headache, irritation of eyes and nose, visual disturbances, nausea and dizziness. These effects did not correlate to other monitoring data, however (SCG). In another study (no reference), mean concentrations of 10 mg/m3 with peak exposure levels of 36 mg/m3 caused vision disturbances (HSE). Occupational exposures up to 47 mg/m3 (eight hour average) (SCG, HSE) with peaks of 125 mg/m3 caused headache and nausea.

EPIDEMIOLOGICAL STUDIES: A higher incidence of bronchial obstruction was found in workers who were occupationally exposed at dimethylethylamine, when compared to not-exposed workers. Lung function tests of workers, before and after a workshift did not reveal any changes (SCG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "Judging from the available data, the critical effect of occupational

exposure to dimethylethylamine is its effect on vision".
HSE: Critical effect is reversible visual disturbance. OES is set in
analogy with triethylamine. A short-term OES was set "since adverse effects
may occur at levels only slightly higher than the 8-hour OES".

Casnr: 148-01-6 Stofnaam: Dinitro-o-toluamide (3,5-)
Synoniemen: Dinitolmide

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 177 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 560 (mannelijke) en 650 (vrouwelijke) mg/kg
SHORT TERM TOX: Honden, 1 jaar gevoerd met 10 mg/kg, hadden geen negatieve effecten.
LONG TERM TOX: Ratten, die 2 jaar 62,5 ppm gevoerd kregen, vertoonden geen negatieve effecten (omgerekende NEL = 14 mg/m3). Ratten die 6 mg/kg kregen gedurende 2 jaar vertoonden alleen een lichte toename in levergewicht (bij vrouwelijke ratten) en lichte vettige veranderingen (beide sexen) in de lever.
CARCINOGENICITY:
REPRODUCTION TOX: Geen afwijkingen in een 3 generatie-proef waarbij 3 en 6 mg/kg (= omgerekend resp. 14 en 28 mg/m3) gevoerd werd (ratten).
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de geringe orale toxiciteit.

Casnr: 25154-54-5 Stofnaam: Dinitrobenzeen (alle isomeren)
Synoniemen:

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,15	1			Ned: Ja		
USA 1992:	0.15	1.0			USA: Ja		
UK 1992:	0.15	1	0.5	3	UK: Ja		UK:
BRD 1992:	-	-			BRD: Ja	IIIB	BRD:
Den 1992:	0,15	1			Den: Ja		
Zwed 1990:	0,15	1	0,3	2	Zwed: Ja		Zwed:

This document concerns the ortho-, meta- and para form of dinitrobenzene (DNB).
Technical DNB exists predominantly of m-DNB with traces of o- and p-DNB.

1:PHYSIOCHEMICAL PROPERTIES: In

MELTING POINT: 90 - 174 °C

BOILING POINT: 299 - 319 °C

2:TOXICOKINETICS: DNB are the strongest methemoglobinemia producing compounds known (DFG).

UPTAKE AND DISTRIBUTION: DNB is absorbed via skin, lungs and digestive tract (DFG).

BIOTRANSFORMATION: Several metabolites are found in the rat; biotransformation includes reduction, conjugation with glutathion (in vitro, the o- and p-isomer) and with glucuronide and sulfate (DFG).

ELIMINATION: In rabbits (metabolites of) DNB are/is after oral intake, within two days excreted primarily in the urine and for a small part in the faeces. Only traces of unchanged DNB could be found.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Intoxication causes methemoglobinemia and Heinz-bodies in experimental animals (DFG). Single or three times administration of respectively 25 and 5 mg/kg m-DNB in rats caused vacuolisation of Sertoli cells and degeneration of spermcells. Lehtal dose in rats is 56 - 126 mg/kg; 30 mg m-DNB/kg caused spasms and paralysis in the hind legs. LD0 in rats for o-; m- and p-DNB is respectively 250; 27 and 29 mg/kg (DFG).

SHORT TERM TOX: Three days administration of 25 mg/kg/d caused reduction in testes weight in rats (DFG). MAEL in rats (16 weeks test) was 3 mg m-DNB/l drinking water (= 0.45 mg/kg bw on average for both female and male rats); minimal effect was hemosiderosis in the spleen.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: 3 mg m-DNB/kg bw/day for 16 weeks caused reduction in spermatogenesis in rats (DFG).

OTHER STUDIES: P-DNB is the most active isomer in producing methemoglobinemia after ip injections in rats. Sc injection of 0.1 mg m-DNB/kg bw/d in dogs resulted after 122 days in central nervous symptoms and death after 144 days (DFG).

3.4:DERMAL: Occlusive application of 400 mg DNB/kg bw on the back of a cat, resulted in death within 28 hours (DFG).

4:MUTAGENICITY: Ames tests were positive for m- (with and without S9-mix) and p-DNB (without S9-mix); o-DNB was negative with or without S9-mix. Recombination test with *S. cerevisiae* was negative for m-DNB, with or without S9-mix. Several metabolites showed positive in Ames -, and/or *B. subtilis* tests (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Intoxications were primarily caused by skin absorption. Affected organs are the blood (methemoglobinemia, cyanosis, Heinz bodies, anemia); CNS (dyspnoe, vertigo, paresthesia) and liver (icterus and liver enlargement) (DFG, ACGIH). Alcohol and heat aggravates the toxic symptoms. Recuperation takes several weeks.

SHORT TERM TOX: More chronic intoxication results in cyanosis, icterus, optical and hearing disturbances. Fatal occupational exposures (four months) are reported; autopsy revealed liver atrophica and fatty degeneration of the kidneys (DFG). Toxic symptoms were induced at occupational exposure to concentrations below 0.25 mg/m³; skin absorption was responsible for the intoxication (DFG).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Former MAK was adopted from a TLV-list, but was not underpinned. Working air concentrations of 0.25 mg/m³ can cause intoxications, when skin absorption is not fully prevented. Data to establish a MAK are lacking. In comparison to other amino- and nitroaromates, DNB isomers are suspected carcinogen. Further research is urgently needed.

ACGIH: TLV is set in comparison with TLV of aniline, because acute toxicity tests revealed a five times higher toxicity for the dinitro compounds than for the mononitro derivatives.

Casnr: 78-34-2 Stofnaam: Dioxathion
 Synoniemen: 2,3-p-Dioxanedithio S,S-bis-(O,O-diethyl phosphorodithioate)

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,2			Ned: Ja	Nee	
USA	1992:	-	0.2			USA: Ja		
UK	1992:	-	0.2			UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,2			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 MELTING POINT: -20 °C

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 0,1 ml op het oog veroorzaakt een reversibele lichte conjunctivitis.
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:
 ACUTE TOX (LOC/SYST): LC50 (muis, rat) = 340 en 1398 mg/m3 resp.
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:
 ACUTE TOX: LD50 (rat) = 23-64 (enkelen: -118) mg/kg; (hond) = 10-40 mg/kg.
 SHORT TERM TOX: NEL bij ratten (op basis van subacuut onderzoek) = 3 ppm (= 0,22 mg/kg/dag vlgs. ACGIH; dit is omgerekend NEL = 1,54 mg/m3), indien de hersen-, erythrocyten- en plasmacholinesterase-remming als primair effect genomen wordt. Bij honden werd een NEL onder dezelfde voorwaarden gevonden tussen de 0,075 en 0,25 mg/kg/dag (= omgerekend tussen 0,525 en 1,75 mg/m3).
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX: Bij ratten is er een NEL van 10 ppm (= omgerekend 3,5 mg/m3).
 OTHER STUDIES: De stof veroorzaakt geen myelinedegeneratie bij kippen.

3.4:DERMAL: LD50 (rat) = 63 mg/kg; (konijn) = 85 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION (SK/RESP):
 ACUTE TOX:
 SHORT TERM TOX: Subacute toediening aan vrijwilligers van 0,075 mg/kg/dag sorteerde geen effect; bij 0,15 mg/kg/dag trad er een vermoedelijk significante daling van de plasmacholinesterase-activiteit op.
 LONG TERM TOX: ADI = 0,0015 mg/kg/dag (= omgerekend 0,01 mg/m3).
 EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de vergelijking van de aanwezige gegevens met de beschikbare informatie over andere organofosfaten.

Casnr: 123-19-3 Stofnaam: Dipropylketon
Synoniemen: 4-Heptanon; DPK

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	50	235			Ned:		
USA	1992:	50	233			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	50	230			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -32.1 °C

BOILING POINT: 143.7 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Ratten overleefden een blootstelling van 4 uur aan 2000 ppm, maar stierven bij 4000 ppm.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 3,73 g/kg (= omgerekend LC50 = 26.110 mg/m3).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gelijk gesteld aan die van methyl isobutyl keton, aangezien deze stof een vergelijkbare acute toxiciteitsgraad bezit.

Casnr: 85-00-7 Stofnaam: Diquat
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,5			Ned:		
USA	1992:	-	0,5*			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 335 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Applicatie van 400 mg/kg op de huid, veroorzaakte geen huidirritatie.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: 100-400 mg/kg (ratten, muizen, konijnen, honden). LD50 (koe) = 30 mg/kg.
SHORT TERM TOX:
LONG TERM TOX: Ratten die gedurende 2 jaar 1000 ppm gevoerd kregen, vertoonden een verminderde voedselopname en groei. Verder waren er geen afwijkingen. Bij dagelijkse voeding van 500 ppm (25 mg/kg/dag) ontstonden er geen afwijkingen in voedselopname, groei, bloed- of urinesamenstelling, of pathologische veranderingen, behalve een (dosis-afhankelijk) cataract; bij 1000 ppm ontstond er bij verschillende dieren een volledige troebeling van een of beide lenzen. Een niveau van 10 ppm (0,5 mg/kg/dag) veroorzaakt bij ratten in een 2 jaars-chronische test, geen cataract (omgerekende NEL = 2,4 mg/m3). Het cataract ontstaat alleen na chronische toediening van diquat; ratten die 8 weken diquat gevoerd kregen, ontwikkelden geen cataract.
Honden, die gedurende 2 jaar 15 of 5 mg/kg/dag diquat gevoerd kregen ontwikkelden geen afwijkingen, behalve (in resp. 10-11; en 15-17 maanden) het cataract. Bij voeding met 1,7 mg/kg/dag ontwikkelden de honden in 4 jaar nog geen oogafwijkingen (omgerekende NEL = 27,4 mg/m3).
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: LD50 (24 uur; konijn) = > 400 mg/kg. Bij 400 mg/kg traden er geen toxische effecten op, ook het histologisch onderzoek leverde geen afwijkingen op.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Na kortdurende blootstelling kunnen er aspecifieke ademhalingsmoeilijkheden optreden. Ook andere aspecifieke toxische effecten (lethargie, dilatatie van de papil (pupil??), gewichtsverlies, buikzwelling en geleidelijk toenemende zwakte) worden beschreven.
SHORT TERM TOX:
LONG TERM TOX: Chronische blootstelling aan diquat heeft voor zover bekend nog geen cataract veroorzaakt bij mensen.
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Diquat is minder gevaarlijk dan het gerelateerde paraquat. Vandaar dat er een hogere TLV is vastgesteld.

Casnr: 136-78-7 Stofnaam: Disul
Synoniemen: Natrium 2,4-dichloorfenoxylethylsulfaat; Sesone

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: decomposes at 245 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 1500 mg/kg (in 1956 bepaald) en vlgs. NIOSH informatie = 730 mg/kg.

SHORT TERM TOX:

LONG TERM TOX: Ratten, die gedurende 2 jaar 20 mg/100g voer (200 ppm) kregen, vertoonden geen negatieve effecten (omgerekende NEL = 46 mg/m3). Bij 60 mg/100g voer (600 ppm), ontstonden er geringe leverbeschadigingen. In hoge (?) doseringen is de stof irriterend voor het maagarmkanaal.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Er zijn geen negatieve effecten bekend van het werken met sesone. Vandaar is er een TLV vastgesteld, als voor irritant stof (nuisance dust).

Casnr: 298-04-4 Stofnaam: Disyston
Synoniemen: Disulfoton; O,O-Diethyl-S-ethylmercaptoethyl dithiophosphate

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned: Ja	Nee	
USA	1992:	-	0.1			USA:		
UK	1992:	-	0.1	-	0.3	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 108 °C at 0.01 torr (0.01mm Hg); 132-133 °C at 1.5 torr (1.5 mm Hg).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Disulfoton bindt sterk aan cytochroom P450 en grijpt in in het mixed function oxidase.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 6,8 en 2,3 mg/kg (resp. mann. en vrouw.) (omgerekende LC50 = resp. 31,4 en 10,6 mg/m3). LD50 ip (rat) = 5,4 (gespeende ratten) en 9,4 (volwassen) mg/kg.

SHORT TERM TOX: Ratten vertonen gewenning na aanvankelijk een daling van cholinesterase te hebben laten zien.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 = 6 mg/kg (vrouwelijke ratten) en 25 mg/kg (mannelijke ratten).

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Disulfoton heeft ongeveer dezelfde LD50 en indirecte werking als parathion, dus is de TLV gelijkgesteld aan deze laatstgenoemde stof. De belangrijkste risico's treden volgens de cie. op na cutane expositie. Een TLV van 0,1 mg/m3 is volgens hen laag genoeg om contaminatie van de werkplek en zodoende cutane expositie te voorkomen.

Casnr: 330-54-1 Stofnaam: Diuron
 Synoniemen: 3-(3,4-Dichlorophenyl)-1,1-dimethylurea; Dichlorfenidim; Karmex

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 MELTING POINT: 158 to 159 °C.
 BOILING POINT: decomposes at 180 °C

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Huidirritatie-testen bij cavia's waren negatief.
 SENSITIZATION: (SK/RESP): Huidsensitizatie-testen bij cavia's waren negatief.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): De lage dampdruk van de stof voorkomt de mogelijkheid van inhalatie van de stof in dampvorm.
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mann. rat) = 3400 mg/kg
 SHORT TERM TOX:
 LONG TERM TOX: NEL (2 jaar) = 250 ppm voor de rat en 125 ppm voor de hond (omgerekende NEL = resp. 58 en 70,6 mg/m3).
 CARCINOGENICITY: Er was geen aanwijzing voor carcinogeniteit van de stof in de hier beschreven studies, noch in een proef met muizen, die gedurende 18 maanden met 1400 ppm (= omgerekend 529 mg/m3) diuron gevoerd werden.
 REPRODUCTION TOX: In een 3-generatietest met ratten, gaf dagelijkse voeding met 125 ppm geen negatieve effecten (= omgerekend 28,9 mg/m3).
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION (SK/RESP):
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de lage acute- en chronische toxiciteit van de stof en op de ervaring die men heeft met de stof sinds 1954.

Casnr: 108-57-6 Stofnaam: Divinylbenzeen (1,3-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	10	50			Ned:		
USA	1992:	10	53			USA:		
UK	1992:	10	50			UK:		UK:
BRD	1992:	?	?			BRD:		BRD:
Den	1992:	10	50			Den:		
Zwed	1990:					Zwed:		Zwed:

Both DFG and ACGIH documents regard all three isomers of divinylbenzene; TLV is set for all these isomers.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -67 °C

BOILING POINT: 199 °C

VAPOR PRESSURE: 0.0000007 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is slight irritant to the mucous membranes of the eyes and respiratory tract, and to the skin (DFG). A divinylbenzene saturated atmosphere (50 - 60% isomer-mixture) did not cause irritation to the respiratory tract of rats at room temperature; at 60 °C it did (DFG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): A single 7-hour exposure to 351 ppm did not show any effects in rats (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (male rats) = 2155 mg/kg(DFG); about 4.1 g/kg (ACGIH). Doses of 630; 1300 and 2500 mg of the isomers/kg cause reversible lethargy; the two highest doses also reduced feed intake.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Ames test with 44% 1,3-divinylbenzene and 18% p-divinylbenzene was negative (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Acutely exposed workers (inhalation; skin- and eye contact) showed mild irritation (ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: There are not enough data to set a MAK.

ACGIH: TLV is partly based on similarity with styrene. Irritation should be minimal below this level "and no other effects are to be expected, so far as is known" The limit should be considered tentative.

Casnr: 944-22-9 Stofnaam: Dyfonate
Synoniemen: Fonofos; O-Ethyl-S-phenyl ethylphosphonothiolothionate

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0.1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 130 °C at 0.1 mm Hg.
Fonofos is a liquid.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION: 98 % van een oraal gegeven dosis, wordt bij de rat binnen 96 uur teruggevonden; voor het grootste gedeelte in de urine, voor een kleiner gedeelte in de faeces en de gal.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 0,1 ml van het technische product in het oog veroorzaakt meestal binnen 24 uur na toediening sterfte, maar de locale oog-irritatie is verwaarloosbaar.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mann. rat) = 13,2 mg/kg (range = 6,81-17,5); (vrouw. rat) = 3 mg/kg lich. gewicht. Dit betekent een sexe-gerelateerde acute toxiciteit.

SHORT TERM TOX: NEL voor honden (beide sexen) = 8 ppm (= 0,2 mg/kg lich. gew. vlg. ACGIH; dit is omgerekend NEL = 3,2 mg/m3), voor een periode van 14 weken.

LONG TERM TOX: NEL voor ratten (beide sexen) = 10 ppm voor een periode van 105 weken (omgerekend NEL = 2,4 mg/m3). In een studie van 106 weken met Beagles, was de NEL 8 ppm (omgerekend NEL = 3,2 mg/m3).

CARCINOGENICITY: In een 105 weken-studie bij ratten was de stof niet carcinogeen.

REPRODUCTION TOX: In een drie-generatie studie met ratten, was de stof niet repro-toxisch bij een niveau van 10 en 31,6 ppm (omgerekend = resp. 2,4 en 7,3 mg/m3).

OTHER STUDIES:

3.4:DERMAL: LD50 (rat) = 147 mg/kg; (cavia) = 278 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Gebaseerd op de cholinesterase remmende eigenschappen en naar analogie met ethyl parathion en andere cholinesterase remmers, is de TLV vastgesteld. Oogcontact moet vermeden worden.

Casnr: 115-29-7 Stofnaam: Endosulfan
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned: Ja	Nee	
USA	1992:	-	0.1			USA: Ja		
UK	1992:	-	0.1	-	0.3	UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 70 - 100 °C (commercial); 106 °C (pure).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (mann. rat) = 50 mg/m3 bij 4 uur blootstelling.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mann. rat) = 43 mg/kg; (vrouw. rat) = 18 mg/kg

SHORT TERM TOX: Ratten, die gedurende 3 maanden 3,2 mg/kg in het voer kregen, vertoonden geen negatieve effecten (omgerekende NEL = 22,4 mg/m3). Honden weerstonden gedurende een jaar doseringen tot 0,75 mg/kg (= omgerekend 5,25 mg/m3) (= de hoogst geprobeerde dosis).

LONG TERM TOX: Bij vrouwelijke ratten werd de overleving bij een blootstelling aan 10 ppm (0,5 mg/kg) gedurende 2 jaar lager en bij mannelijke ratten trad er een afname op van het testisgewicht. Deze bevindingen hadden een dubieuze significantie (omgerekende (M)AEL = 3,5 mg/m3). Duidelijke pathologische afwijkingen werden pas gevonden bij een dosering van 5 mg/kg/dag. Deze afwijkingen bestonden uit schade aan niertubuli en hydropische veranderingen in de lever.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (mann. rat) = 130 mg/kg; (vrouw. rat) = 74 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Na inhalatie van endosulfan-stof ontstonden verschijnselen als misselijkheid, warrigheid, opwinding, warmte-aanvallen en droge mond.

Hanteerders van een 50% wettable poeder, vertoonden allen convulsies (1 of meer). Begin van ziekteverschijnselen ontstonden al na een paar dagen werken met de stof. Herstel verliep rustig.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is afgeleid van die voor aldrin of dieldrin, maar lager dan deze, omdat endosulfan toxischer is voor vrouwelijke ratten en omdat er al na een paar dagen expositie, toxische verschijnselen op kunnen treden, hetgeen niet het geval is bij dieldrin of aldrin. Beide stoffen zijn chemisch gerelateerd aan endosulfan en voor het overige van vergelijkbare toxiciteit, ook voor wat betreft de klinische symptomen bij humane intoxicatie.

Casnr: 72-20-8 Stofnaam: Endrin
Synoniemen: 5,8-Dimethanonaphtalene

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:	Ja	
USA	1992:	-	0.1			USA:	Ja	
UK	1992:	-	0.1	-	0.3	UK:	Ja	UK:
BRD	1992:	-	0,1	-	1	BRD:	Ja	BRD:
Den	1992:	-	0,1			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: circa 200 °C.

BOILING POINT: Decomposes at 245 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Endrin wordt na absorptie in het maagdarmkanaal, gedeeltelijk in het vet opgeslagen. Bij ratten, die 0,32 mg/kg gevoerd kregen, onstond er een evenwichtssituatie na 5 of 6 dagen. De biologische halfwaardetijd bij mannelijke ratten is drie dagen; bij vrouwelijke ratten vier dagen.

BIOTRANSFORMATION:

ELIMINATION: Gedeeltelijk wordt endrin uitgescheiden in de urine en faeces, zowel onveranderd als in de vorm van drie metabolieten.

3:ANIMAL EXPERIMENTS: Endrin is een stereo-isomeer van dieldrin.

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Bij expositie van 10 ratten aan 2000 mg/m3 gedurende 1 uur, stierven er drie.

SHORT TERM TOX: Ratten en muizen die gedurende 26 weken; 5 d/w; 7 u/d blootgesteld werden aan 15 mg/m3 gesublimeerde (= vervluchtigd en gecondenseerd) endrin, vertoonden geen negatieve effecten. Twee van de vier identiek blootgestelde konijnen, stierven.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (aap) = 3; (muis) = 1,37; en (rat) = 3 mg/kg (LC50 humaan = omgerekend resp. 21; 9,6 en 21 mg/m3). LD50 iv (muis) = 2,3 mg/kg. Endrin produceerde sneller convulsies en sterfte dan dieldrin.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (vrouw. rat) = 15 mg/kg; (mann. rat) = 18 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: De dosis die convulsies veroorzaakt ligt tussen de 0,2 en 0,25 mg/kg (= omgerekend 1,4 en 1,75 mg/m3); 1,0 mg/kg (= omgerekend 7 mg/m3) veroorzaakt herhaalde aanvallen. Hierbij ontstaan de verschijnselen binnen ongeveer 3 uur.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Werknemers met een expositie van 10 - 18 jaar aan endrin, brachten geen veranderingen aan het licht, vergeleken met een controlegroep.

In een poging de orale toxiciteit van endrin te vergelijken met de inhalatoire, werd gezegd dat de mens waarschijnlijk niet gevoeliger is dan rat en muis, en minder gevoelig dan het konijn.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op extrapolatie van de acute dier-toxicologische gegevens en het bewijs dat dit niveau geen ziekte in de mens veroorzaakt. Ook heeft de orale LD50 in vergelijking met vergelijkbare pesticiden meegespeeld.

Casnr: 13838-16-9 Stofnaam: Enfluraan
Synoniemen: Efrane; 1,1,2-trifluor-2-chloorethyldifluormethylether

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	75	575			Ned:		
USA	1992:	75	566			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	2	15			Den:		
Zwed	1990:	10	80	20	150	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 56.5 °C
VAPOR PRESSURE: 174.5 mm Hg (at 20 °C).

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Acute toxiciteitseffecten bestaan uit depressie van het CZS. Blootstelling aan 15.000-20.000 ppm veroorzaakt anesthesie. Bij diepe anesthesie ontstaan spiertrekkingen en bij hoge blootstelling aan enflurane, convulsies.
SHORT TERM TOX: Zelfs na herhaalde anesthesieën zijn er geen sporen van nier- of leverbeschadigingen gevonden (diersoort onbekend).
LONG TERM TOX:
CARCINOGENICITY: Er zijn structuur-overeenkomsten tussen enflurane en bepaalde bekende humane carcinogenen. Experimenteel zijn er echter geen aanwijzingen voor carcinogeniteit van de stof.
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (muis) bij ip toediening is 4 g/kg.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: In de Amestest en bij hamster-longfibroblasten zijn geen aanwijzingen gevonden dat de stof mutageen is.

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Blootstelling van vrijwilligers aan 2500 ppm veroorzaakte een verandering in beslis-gedrag en vermindering van leervermogen. Blootstelling aan 4200 en 5300 ppm veroorzaakte gedragsveranderingen op intellectueel vlak. 2000 ppm had geen effect. Andere onderzoekers vonden veel lagere drempelwaarden. Deze uitkomsten werden in later onderzoek niet bevestigd.
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de veronderstelling dat enflurane een veiliger anestheticum is dan halothaan of trichloorethyleen en er geen negatieve effecten bekend zijn bij sub-anesthetische concentraties.

Casnr: 556-52-5 Stofnaam: Epoxy-1-propanol (2,3-)
Synoniemen: Glycidol

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	150			Ned:		
USA	1992:	25	76			USA:		
UK	1992:					UK:		UK:
BRD	1992:	50	150	100C	300C	BRD:		BRD:
Den	1992:	0,2C	1C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -45 °C
BOILING POINT: 166.11 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Huid: eenmalige applicatie bij het konijn is matig irriterend; herhaalde dagelijkse applicaties veroorzaakten ernstige irritatie na 4 dagen.

Oog: pure glycidol op het oog veroorzaakte een ernstige maar reversibele beschadiging van de cornea bij konijnen.

Respiratietractus: Na expositie aan de damp treedt er irritatie op in de vorm van pneumonitis en emphyseem.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (muis, 4 uur) = 450 ppm; LC50 (rat, 8 uur) = 580 ppm.

SHORT TERM TOX: Ratten, die gedurende 50 dagen; 7 u/d blootgesteld werden aan 400 ppm, vertoonden geen systemische effecten. Na de eerste exposities werden een hele lichte irritatie van de ogen, met lichte traanvloed en korstvorming op de oogleden, en lichte ademhalingsproblemen gezien. Na afloop was er een lichte afname van de groeisnelheid opgetreden.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: Na 3 applicaties per week van 100 mg glycidol in aceton (5% opl) bij muizen, gedurende 520 dagen zijn er geen huidtumoren ontstaan.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Oog- en respiratoire irritatie treden op (= waarschuwingseffect tegen over-expositie).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Aangezien de oorspronkelijk toegepaste veiligheidsmarges van 9 en 13 op LC50-waarden voor resp muizen en ratten wat klein gevonden werden, is de TLV in 1981 gehalveerd tot 25 ppm.

Casnr: 75-08-1 Stofnaam: Ethaanthiol
Synoniemen: Ethylmercaptaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,5	1			Ned:		
USA	1992:	0.5	1.3			USA:		
UK	1992:	0.5	1	2	3	UK:		UK:
BRD	1992:	0,5	1	1C	2C	BRD:		BRD:
Den	1992:	0,5	1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -147.97 to -144.4 °C

BOILING POINT: 36 °C

VAPOR PRESSURE: 442 mm Hg (at 20 °C)

ODOR THRESHOLD: 0.001 ppm (100% response)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: The thiol is supposed to be oxidized into the sulfide and further into ethyl methyl sulfone.

ELIMINATION: The sulfur was mainly excreted as inorganic sulfate in mice and guinea pigs. Only 10 - 20% of the excreted sulfur in the urine were organic metabolites (eg. ethyl methyl sulfone).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): High concentrations of the vapor are considerably irritating to rabbit's eyes.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (4-hour) in rats and mice = resp. 2770 and 4420 ppm. There was no pathology of note.

SHORT TERM TOX: The threshold effect concentration in rats, rabbits and mice is considered to be 100 mg/m3 (five months exposure period), with deviations in the cardiovascular system regulation and in organ weights as critical effects.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 ip in the rat is about 450 mg/kg. Maximal, sublethal ip doses produce relatively deep and long lasting sedation (one to several hours), followed by a lethargic condition. Ip administration of the compound was followed by lymphocytic infiltration in the hepatic portal spaces, with occasional necrotic foci.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Exposure at 1 mg/m3 three hours daily for 5 to 10 days did not, and at 10 mg/m3 did show effects such as periodic nausea, irritation of mucous membranes of the lips, nose and mouth, and a sensation of fatigue, together with altered taste reactions to bitter and sweet substances.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the prevention of discomfort and minor irritation (disagreeable odor).

Casnr: 64-17-5 Stofnaam: Ethanol
Synoniemen: Ethylalcohol

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 1000	1900			Ned:		
USA	1992: 1000	1880			USA:		
UK	1992: 1000	1900			UK:		UK:
BRD	1992: 1000	1900	2000C	3800C	BRD:		BRD:
Den	1992: 1000	1900			Den:		
Zwed	1990: 1000	1900			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -114.1 °C
BOILING POINT: 78.5 °C
VAPOR PRESSURE: 43 mm Hg (at 20 °C)
ODOR THRESHOLD: 50 - 350 ppm

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake via the lungs is easy (33 to 62%); uptake via the skin is small (SCG).
BIOTRANSFORMATION: Ethanol is biotransformed primarily in the liver; double oxidation first into aldehyde and then into acetate, which is released to the blood. Further oxidation into carbon dioxide, water and fatty acids, happens in peripheral tissue (SCG).
ELIMINATION: Small amounts are excreted unchanged in the exhaled air, urine or perspiration. Average elimination rate = 100 mg/kg bw/hour for man (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LD0 (rats; guinea pigs and mice) = respectively 13,000; 22,000; and 29,000 ppm (resp. 22; 9; and 7 hours). Poisoning symptoms include loss of coordination and narcosis (SCG, ACGIH). Exposure to 4000 ppm (four hours) did not; but to 8000 ppm did cause behavioral changes in rats (SCG).
SHORT TERM TOX: Continuous exposure of rats to 13,300 ppm (14 days); 7980 to 11,704 ppm (4 days); or 10,640 ppm (26 days) had an effect on liver weight and triglyceride- or lipid peroxide content; and on cell numbers in spleen, thymus and bone marrow. Cont. exposure of rats (7980 gradually increasing to 11,704 ppm) and mice (5320 to 10,640 ppm) during 10 days resulted in trembling and spasms after termination of exposure. No adverse effects were seen when rats were exposed to 46 ppm, cont. for 90 days (SCG).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX: The only effect of exposure of rats to 10,000 - 20,000 ppm (during or before (males 6 weeks) gestation; 7 h/d) were biochemical changes in the brain of the offspring and reduced fetal weight (SCG).
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY: According to IARC the metabolite acetaldehyde is carcinogenic to experimental animals; there is inadequate proof of carcinogenicity of ethanol in animals (SCG).
REPRODUCTION TOX: Teratogenic effects of exposure during gestation have been observed in several studies (SCG).
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Ethanol induced SCE; chromosomal aberrations and irregular chromosome counts in ova and sperm; and micronuclei. A dominant lethal test was positive. Several other mutagenicity tests were negative. The metabolite acetaldehyde showed to be mutagenic/genotoxic in several test systems (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to 1800 - 200 ppm (30 min) caused coughing, dry throat and temporary bronchial constriction (SCG). Some authors state that concentrations from 250 to 1064 ppm are safe for exposure during the working day (ACGIH). The concentrated liquid can be very irritating to the eyes, causing reversible damage to the cornea and conjunctiva (SCG, ACGIH); and to the skin after repeated contact (SCG).
SENSITIZATION (SK/RESP): A few hypersensitivity reactions have been described

(SCG).

ACUTE TOX: Under exercising conditions, 10,000 ppm was bearably tolerable. A concentration around 1380 ppm caused headache (study from 1918); 3000 ppm caused nasal irritation, hot flashes and a sensation of pressure in the forehead. Causal relation is doubted, however, because the ethanol concentration in the blood is very low at these exposure concentrations (SCG). In one experiment 1000 ppm caused slight symptoms of poisoning; 5000 ppm caused strong stupor and morbid sleepiness (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: IARC states that drinks, containing alcohol are carcinogenic to humans. Repeated intake of alcohol during gestation has shown to damage human fetuses (SCG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is irritation of the mucous membranes.

ACGIH: Long and widespread experience supports the recommendation of a TLV of 1000 ppm.

Casnr: 563-12-2 Stofnaam: Ethion
Synoniemen: Nialaat

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	0,4			Ned: Ja	Nee	
USA 1992:	-	0.4			USA: Ja		
UK 1992:					UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:					Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -12 to -13 °C
VAPOR PRESSURE: 0.0000015 mm Hg

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 0.05 ml of the liquid is immediately irritating to the eyes of rabbits. Damage is reversible.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (25% WP dust; one hour exposure) = 710 and 7200 mg/kg for female and male rats respectively.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Reported LD50's for rats are 13; 65; 96; and 208 mg/kg. LD50 of 95% technical ethion (albino rats) = 87.4 mg/kg and for female rats = 24.4 mg/kg. Its LD1 = 56.8 mg/kg and LD99 = 136.4 mg/kg.
SHORT TERM TOX:
LONG TERM TOX: Cholinesterase is completely and markedly inhibited in rats fed respectively 600 and 300 ppm in the diet (= omgerekend 138 en 69 mg/m3). Surviving animals (when fed up to 1500 ppm) showed no macro- or microscopic changes.
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: "The median acute dermal lethal dose = 915 mg/kg" (?)

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Poisoning of workers, while picking peaches and grapes were reported.
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the above data, noting the difference in toxic response between sexes in rats. Skin notation because "evidence exists that ethion may be absorbed through the skin".

Casnr: 628-96-6 Stofnaam: Ethyleenglycoldinitraat
Synoniemen: Ethyleendinitraat; Nitroglycol; EGDN

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,05	0,3			Ned: Ja		
USA 1992:	0.05	0.31			USA: Ja		
UK 1992:	0.2	1.2	0.2	1.2	UK: Ja		UK:
BRD 1992:	0,05	0,3	0,1	0,6	BRD: Ja		BRD:
Den 1992:	0,02C	0,12C			Den: Ja		
Zwed 1990:	0,03	0,2	0,1	0,6	Zwed: Ja		Zwed:

NIOSH REL: 0.1 mg/m3 STEL skin notation.

The NIOSH criteria document; Nitroglycerin and Ethylene Glycol Dinitrate (1978) is not on hand on the Department.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -22.3 °C

BOILING POINT: 197.5 °C ("explosion point": 114 °C)

VAPOR PRESSURE: 0.037 to 0.05 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorbed via skin and mucous membranes of respiratory and digestive tract. Total uptake is primarily determined by skin uptake (SCG).

BIOTRANSFORMATION: EGDN is transformed primarily in the liver into carbon dioxide and nitrate and nitrite (SCG, DFG).

ELIMINATION: EGDN and the products are excreted in the urine (SCG, DFG).

3:ANIMAL EXPERIMENTS: Unlike humans, animals develop methemoglobinemia. NEL in animals is 30 times higher than NEL in humans (DFG).

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX: Experimental data are not interesting because of the lesser susceptibility and the (partly) different kind of effects in animals (DFG).

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 616 mg/kg (DFG).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 ip (mice) = 800 mg/kg (DFG).

3.4:DERMAL:

4:MUTAGENICITY: EGDN was mutagenic in a mutagenicity study using bacteria. (SCG).

5:OBSERVATIONS IN MAN: Primarily workers in dynamite factories are exposed to EGDN, but always in combination with Nitroglycerin (=NG). Because EGDN is 160 times more volatile than NG and the usual mixtures contain 3 to 4 times as much EGDN as NG, the adverse effects associated with the inhalation of the vapor from such mixtures can be attributed primarily to EGDN (ACGIH, DFG).

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Several cases of "sudden death" in dynamite workers are reported. EGDN affects the circulatory system; symptoms include headache, heart palpitations, increased heart rate, dizziness and nausea. Headaches and changes in bloodpressure can appear at air concentrations of 0.1 mg/m3 (SCG) or 0.5 mg/m3 (DFG). Workers who are not particularly sensitive to the vessel dilating effect of EGDN can develop some degree of adaptation, which rapidly disappears during periods away from work.

SHORT TERM TOX:

LONG TERM TOX: The chronic effect (vasoconstriction) is a reaction compensating the acute symptoms (DFG).

EPIDEMIOLOGICAL STUDIES: Several studies show that workers with long-term exposure to EGDN (and NG) had a significant excess mortality from heart- or cerebrovascular disease (SCG, ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Total uptake is primarily determined by skin uptake, which makes it impossible to state a relationship between long-term effects and air concentrations.

DFG: MAK is based on information about workers who were only exposed to EGDN by inhalation and not via the skin. A MAK of 0.05 ppm is about the level at which bloodpressure changes are not found any more.

ACGIH: TLV is raised from 0.02 to 0.05 ppm in 1983, in analogy with propylene glycol dinitrate and considering the "development of tolerance to headaches resulting from repeated 8-hour exposures to 0.2 ppm".

Casnr: 109-94-4 Stofnaam: Ethylformiaat
Synoniemen: Ethyl formate

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	100	300			Ned:	Nee	
USA	1992:	100	303			USA:		
UK	1992:	100	300	150	450	UK:		UK:
BRD	1992:	100	300	200C	600C	BRD:		BRD:
Den	1992:	100	300			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -80 °C

BOILING POINT: 54.3 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: De stof passeert goed door de alveolaire membraan en wordt gemakkelijk in het bloed opgenomen.

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof is irriterend voor mucosae. Bij blootstelling aan 5000 ppm ontstaat bij de dieren oogirritatie en speekselvloed.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): De stof werkt narcotiserend en veroorzaakt depressie van het CZS, wat kan leiden tot de dood door respiratoir en cardiaal falen, zonder convulsies en coma. De letale dosis is gelijk aan de narcotisch werkende dosis, nl 10.000 ppm.

Katten, blootgesteld aan 10.000 ppm gingen onder narcose na 75 minuten en dood na 90 minuten. Ratten gingen dood bij 4 uur blootstelling aan 8000 ppm en overleefden 4 uur 4000 ppm. Honden gingen dood na 4 uur 10.000 ppm.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Blootstelling aan 330 ppm veroorzaakt een lichte irritatie van de ogen en een snel toenemende neus-irritatie. De stof heeft een anesthesische werking (onbekende concentraties).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld met het idee dat oog- en neusirritatie wordt voorkomen.

Casnr: 16219-75-3 Stofnaam: Ethylideennorborneen
 Synoniemen: ENB; Ethylidenebicyclo(2,2,1)hep-2-ene

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	5C	25C			Ned:	Nee	
USA 1992:	5C	25C			USA:		
UK 1992:					UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	5C	25C			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 67 °C at 50 mm Hg.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Vijf van de zes ratten die gedurende 4 uur aan 4000 ppm werden blootgesteld, stierven. LC50, 4 uur (vrouwelijke muis) = 730 ppm en (konijn) = 3100 ppm.

SHORT TERM TOX: 88 Blootstellingen van ratten aan 237 ppm (7u/d; 5d/w) was voor bijna alle dieren fataal. Bij sectie werden leverlesies, testisatrofie en hydrothorax gevonden. Bij 90 ppm gingen er geen dieren dood. Wel werden er nierlesies gevonden, evenals vergrote levers. Het "no-ill-effect" niveau van 88 exposities was voor vrouwelijke ratten 61 ppm en voor mannelijke soortgenoten iets lager(?).

Bij honden traden er bij 89 blootstellingen aan 93 ppm onder andere testisatrofie, leverlesies en lichte veranderingen in bloedparameters op. De effecten waren bij 61 ppm minder en traden niet op bij 22 ppm.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Blootstelling van vrijwilligers aan 11 ppm gedurende 30 minuten veroorzaakte irritatie aan ogen en neus. Bij 6 ppm trad er een voorbijgaande oogirritatie op.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Er wordt geen motivatie gegeven, maar ongetwijfeld is deze gebaseerd op de bevindingen bij vrijwilligers.

Casnr: 100-74-3 Stofnaam: Ethylmorpholine (N-)
Synoniemen:

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 5	23				Ned: Ja		
USA	1992: 5	24				USA: Ja		
UK	1992: 5	23	20	95		UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992: 5	23,5				Den: Ja		
Zwed	1990: 5	25	10	50		Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -62.78 °C

BOILING POINT: 138 °C

VAPOR PRESSURE: 6 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake is also possible via intact skin.

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): N-Ethylmorpholin is very irritating to the eyes and irritating to the skin of rabbits (DFG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): One of six rats died after 4-hour exposure to 200 ppm (DFG); and 2000 ppm (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 1780 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 iv (mice) = 180 mg/kg (DFG).

3.4:DERMAL:

4:MUTAGENICITY: Ames test (TA 1535 and 100) without S9-mix was positive. (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): The compound is irritating mucous membranes of eyes and upper respiratory tract, and the skin. NEL = 25 ppm (2.5 min. exposure); at 50 ppm only part of the exposed volunteers experienced (slight) irritation.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Workers exposed to 40 ppm or more substituted morpholin (eg ethylmorpholin) experienced towards the end of the shift a rapidly reversible distortion of vision caused by corneal edema; halos, drowsiness and foggy vision were also mentioned after exposure to 3-4 ppm with peaks up to 11 ppm.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Not enough data are available to establish a MAK, but in any case it seems that the MAK should be lower than 5 ppm.

ACGIH: TLV is based on prevention of corneal damage.

Casnr: 78-10-4 Stofnaam: Ethylsilicaat
Synoniemen: Tetra-ethylorthosilicaat; tetra-ethoxysilaan

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	10	85			Ned:		
USA	1992:	10	85			USA:		
UK	1992:	10	85	30	255	UK:		UK:
BRD	1992:	20	170	40C	340C	BRD:		BRD:
Den	1992:	10	85			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -85 °C

BOILING POINT: 168 °C

VAPOR PRESSURE: 1 mm Hg (at 20 °C)

ODOR THRESHOLD: 85 ppm may be detected by odor.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): "NEL" in rats and guinea pigs is 2000 ppm in 60 min.-exposure, and 500 ppm in several-hours-exposure (effect = serious disturbances).

SHORT TERM TOX: Exposure of rats at 400 ppm (7 h/d; 30 days) resulted in higher mortality and kidney, lung and liver damage. NEL in rats and guinea pigs was 88 ppm (7 h/d; 5 d/w; 90 days) (highest level tested) whereas in mice this was the MAEL, with a decrease in kidney weight as the only adverse effect; NEL in mice was 50 ppm.

Animals exposed at 164 ppm (8 h/d; 17 days) showed decreased weight gain. Five to ten 7-hour exposures at 125 ppm resulted in slight to moderate kidney damage. These authors state that also lower levels can cause kidney damage when exposures are repeated.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure at 250 ppm causes slight irritation of the eyes and nose.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The TLV is lowered from 100 to 10 ppm in 1977, based on short term animal studies from 1937 and 1948.

Casnr: 22224-92-6 Stofnaam: Fenamifos
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned: Ja	Nee	
USA	1992:	-	0.1			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 49.2 °C (pure); 40 °C (technical).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorptie treedt op via de huid, de longen en het maagdarmlkanaal.

BIOTRANSFORMATION: De stof wordt in de rat en de koe, op een snelle manier via dealkylatie en oxidatie van de thioether, omgezet in sulfoxide en sulfone-derivaten.

ELIMINATION: Eliminatie geschiedt voornamelijk via de urine.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof is voor konijnen niet irriterend voor de huid, noch voor de ogen.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rat) voor 1 en 4 uur = resp. 110-175 mg/m3 en 91-100 mg/m3.

SHORT TERM TOX: Ratten werden gedurende 3 weken blootgesteld aan 0,03; 0,25 en 3,5 mg/m3. Er werden geen symptomen opgemerkt. In de parameters groei; hematologie; klinische chemie; macro- en microscopische pathologie werden geen veranderingen gevonden. Alleen in de hoogste concentratie-groep werd een verlaging van de plasma-cholinesterasespiegel gevonden. Dus ligt de NEL tussen 0,25 en 3,5 mg/m3 bij ratten.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 2-19 mg/kg; (muis) = 22 mg/kg; (cavia) = 56-100 mg/kg; (konijn) = 10-17 mg/kg; en ong. 10 mg/kg in honden en katten.

SHORT TERM TOX:

LONG TERM TOX: Honden kregen gedurende 2 jaar 0,5; 1,0; 2; 5 en 10 ppm en ratten 3; 10 en 30 ppm gevoerd. De doseringen tot en met 10 ppm gaven geen effect te zien. De NEL (waarbij het kritische effect is daling van de cholinesterase spiegel) voor honden en ratten waren resp. 1 en 3 ppm (omgerekende NEL = resp. 0,25 en 1,05 mg/m3).

CARCINOGENICITY: In een 2 jaar lange proef waarin honden en ratten fenamifos gevoerd kregen in verschillende doseringen, waren er tot en met een dosering van 10 ppm geen aanwijzingen voor oncogene effecten van de stof.

REPRODUCTION TOX: Er werden geen embryotoxische en teratogene effecten gevonden bij konijnen en ratten, die resp. 0,2; 0,4 mg/kg/dag en 0,3; 1,0 en 3 mg/kg/dag gevoerd kregen. In een drie-generatiestudie bij ratten, die 3; 10 en 30 ppm gevoerd kregen, werden geen effecten op de reproductie gevonden.

OTHER STUDIES: Fenamifos heeft geen vertraagd neurotoxisch effect bij kippen.

3.4:DERMAL: Konijnen werden dmv dermale applicaties gedurende 3 weken dagelijks behandeld met 0,5; 2,5 en 10 mg/kg. In de hoogste doseringgroep trad er een lichte vertraging in groeisnelheid op. In de twee hoogste doseringgroepen was er een verlaging van de plasma-cholinesterasespiegel te vinden.

4:MUTAGENICITY: De stof had geen mutagene activiteit in de Ames-test; in E. coli; in een dominant letaalttest in muizen en in een micronucleustest in muizen.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Er zijn geen publicaties over intoxicaties bij de mens bekend.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Er zijn geen rapportages bekend van effecten bij mensen ten gevolge van blootstelling aan (gemeten luchtconcentraties van) fenamifos.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Alle bovenvermelde gegevens zijn meegenomen in de vaststelling van de TLV. Eveneens is er gekeken naar de gehanteerde TLV van andere organofosfaten.

Casnr: 299-84-3 Stofnaam: Fenchloorfos
Synoniemen: Ronnel

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	-	10			Ned:		
USA 1992:	-	10			USA:		
UK 1992:	-	10			UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	-	5			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 41 °C

BOILING POINT: decomposes.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mannelijke en vrouwelijke rat) = 1250 en 2630 mg/kg resp.

Andere species hebben vergelijkbare LD50's; bij de hond is de LD50 >500 mg/kg.

SHORT TERM TOX: Ratten, die 328 en 164 mg/kg (per dag?) gevoerd kregen, vertoonden binnen 2 weken symptomen zoals onder andere: motorische irritatie; tremoren; verhoogde gevoeligheid voor geluid en tactiele prikkels; tranen en verhoogde speekselvloed. In het verdere verloop van de studie vielen er enkele doden. Ratten die 16,4 en 8,2 mg/kg (per dag?) kregen, vertoonden geen klinische symptomen. (Duur van de studie???)

LONG TERM TOX: Ratten, die gedurende 2 jaar 50 mg/kg ronnel gevoerd kregen, vertoonden geen veranderingen in groeisnelheid, voedselopname, mortaliteit en bloedaanmaak (hematopoiesis) (omgerekende NEL = 350 mg/m3).

Honden die 2 jaar lang 10 mg/kg/dag gevoerd kregen, vertoonden geen hematologische of biochemische veranderingen in het bloed behalve een depletie van cholinesterase. Gewichten van organen en weefselonderzoek waren "normaal" (omgerekende MAEL = 70 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP): Bij een plak-proef waar 50 mensen aan mee deden werden geen sensibiliserende eigenschappen van de stof ontdekt.

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld op basis van de beschreven rapportages.

Casnr: 92-84-2 Stofnaam: Fenothiazine
Synoniemen:

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							serend
Ned	1994:	-	5			Ned: Ja	
USA	1992:	-	5			USA: Ja	
UK	1992:					UK:	UK:
BRD	1992:					BRD:	BRD:
Den	1992:	-	5			Den: Ja	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 185.1 °C

BOILING POINT: 371 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: De stof wordt na ingestie gemakkelijk opgenomen vanuit het maagdarmkanaal. Ook treedt absorptie op via de huid.

BIOTRANSFORMATION:

ELIMINATION: De stof wordt in onveranderde en in geoxideerde vorm in de urine uitgescheiden.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP): Fotosensitized keratitis met oedeem van de cornea kan optreden bij varkens en koeien bij systemische toediening of na injectie in de achterste oogkamer.

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Een gemiddelde of hoge dosis (?) kan aanleiding zijn voor het ontstaan van toxische hepatitis; hemolytische anemie; buikkrampen en tachycardie. Ook zijn beschreven: irritatie van het maagdarmkanaal en de huid; nierbeschadiging; huid-fotosensitizatie en jeuk. Tevens een allergische contactdermatitis zonder invloed van licht. De LD50 (rat) = 5 g/kg (omgerekende LC50 humaan = 35.000 mg/m3).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Na opname via inhalatie; via de huid of via ingestie trad er bij spuiters in boomgaarden, intense jeuk, irritatie en rood worden van de huid op.

SENSITIZATION (SK/RESP): Fotosensitizatie kan al optreden bij opname van minder dan 0,75 gram.

ACUTE TOX: Keratitis is beschreven bij werknemers die omgingen met fenothiazine, maar de aard van de keratitis is niet beschreven.

SHORT TERM TOX: Werknemers die in hun arbeidssituatie blootgesteld werden aan 15-48 mg/m3, kregen verkleuringen van haar en nagels en huidirritatie. Tav de huidirritatie, die gepaard ging met roodheid en jeuk, ontwikkelden ze na enkele weken tolerantie. De verkleuringen van haar en nagels was tgv direct contact (bedekte haren en nagels waren niet verkleurd). de verkleuringen waren reversibel van aard. Er werden bij dit blootstellingsniveau geen systemische effecten gevonden.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is zodanig vastgesteld dat huid-effecten voorkomen moeten worden.

Casnr: 115-90-2 Stofnaam: Fensulfothion
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 138 - 141 °C (at 0.01 mm Hg).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: De stof via de longen goed geabsorbeerd.

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (mannelijke rat) 1 uur = 113 mg/m3; 4 uur = 29,5 mg/m3. De stof is veel toxischer voor vrouwelijke dieren dan voor hun mannelijke soortgenoten.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mannelijke rat) = 4 mg/kg; (vrouwelijke rat) = 1,8 mg/kg.

SHORT TERM TOX: In een sub-chronische studie bij ratten en honden was de NEL resp. 1 en 2 ppm (omgerekend NEL = 0,35 en 0,5 mg/m3).

LONG TERM TOX: De NEL bij ratten in een 17 maanden-test was 1 ppm (kritische effect is daling van de cholinesterase activiteit). Er werden geen schadelijke effecten op de inwendige organen geconstateerd (bij welke dosering is niet duidelijk) (omgerekende NEL = 0,35 mg/m3).

Bij honden in een studie van twee jaar, was het belangrijkste effect een remming van de cholinesterase-activiteit. De NEL was 1 ppm (omgerekende NEL = 0,25 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX: Toediening aan drachtige konijnen veroorzaakte geen embryotoxische effecten en geen malformaties bij de jongen.

In een (?) generatietest bij muizen traden er bij een dosering van 2 en 4 ppm, geen negatieve effecten voor de reproductie op.

OTHER STUDIES:

3.4:DERMAL: LD50 (mannelijke rat) = 14-30 mg/kg; (vrouwelijke rat) = 3-3,5 mg/kg.

4:MUTAGENICITY: De dominant letaal test bij muizen was negatief.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Applicatie van een 5% granulaire formulering, 2 dd twee uur, 5 dagen achter elkaar veroorzaakte wel huidirritatie, maar geen systemische effecten (daling van bloed-cholinesterase) bij vrijwilligers, ondanks de vrij grote dermale toxiciteit bij proefdieren.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de cholinesterase-remmende werking van de stof.

Casnr: 638-21-1 Stofnaam: Fenylfosfine
Synoniemen:

	tgg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	tatie	geen	serend
Ned	1994: 0,05C	0,25C	Ned:	Nee	
USA	1992: 0.05C	0.23C	USA:		
UK	1992:		UK:		UK:
BRD	1992:		BRD:		BRD:
Den	1992: 0,05C	0,25C	Den:		
Zwed	1990:		Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 138 °C
BOILING POINT: 160 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rat) 4 uur = 38 ppm.

SHORT TERM TOX: Herhaalde blootstelling (?) aan 7,6 ppm resulteerde in verhoogde aanmaak van erythrocyten in extramedullaire gebieden van de milt.

In een 90 dagen test bij ratten (beide sexen) en honden, werden de dieren 5 d/w; 6 u/d blootgesteld aan 0,6 en 2,2 ppm. Na een maand werden de 0,6 ppm ratten overgevoelig voor geluid en aanrakingen en kregen een lichte hyperemie. De groeisnelheid was niet afwijkend gedurende de hele test. Aan het eind van de test ontstond er een milde dermatitis. In de 2,2 ppm ratten ontstonden er significante veranderingen in hematologie en morfologie (?). De veranderingen bestonden uit een afname van rode bloedcellen, van hemoglobine en hematocriet, die meteen bij expositie ontstonden, maar weer verdwenen waren 4 weken na beëindiging van de blootstelling. In de 2,2 ppm groep ratten ontstonden tevens een verhoogde aanmaak van erythrocyten in de milt, een milde hemolytische anemie, dermatitis en een irreversibele degeneratie van de testes.

Bij de honden traden er bij beide groepen symptomen op als: wisselend verlaagde eetlust, misselijkheid, diarree, tranen en tremoren in de achterhand. Toch zouden de honden de expositie beter verdragen dan de ratten. De degeneratie van de testes die optrad, herstelde zich gedeeltelijk binnen de herstelperiode van 1 maand. Er was geen significant gewichtsverlies bij beide testniveau's.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: zie boven.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Er wordt gezegd dat 2,2 ppm een duidelijk effect-niveau is en 0,6 ppm een "drempel-niveau voor laboratoriumdieren. Met een veiligheidsfactor van 10 voor lichte, reversibele effecten, komt men dan op 0,05 ppm als TLV.

Casnr: 122-60-1 Stofnaam: Fenylglycidylether
 Synoniemen: PGE; Fenoxypreeenoxide; 2,3-Epoxypropyl fenyl ether

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	tatie	geen	serend
Ned	1994: 1	6			Ned:	Nee	
USA	1992: 1	6.1			USA:		
UK	1992:				UK:		
BRD	1992: -	-	-	-	BRD:	IIIA2	UK: Ja
Den	1992: 1C	5C			Den: Ja	OO	BRD: Ja
Zwed	1990: 10	60	15	90	Zwed: Nee		Zwed: Ja

NIOSH REL (1992) = 6 mg/m3 (1 ppm) Ceiling (15 min.) Potential occupational carcinogen.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 3.5 °C

BOILING POINT: 245 °C

VAPOR PRESSURE: 0.01 mm Hg (at 25 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Rapid absorption by the digestive tract, and the skin of rabbits and rats (NIOSH, DFG).

BIOTRANSFORMATION: The epoxide-ring of the compound will react with almost all nucleophilic substances (NIOSH). PGE is reduced in the liver by the enzyme epoxide hydrolase to form the corresponding diol (NIOSH). Another pathway is conjugation with Glutathion-S-Alkyltransferase in the liver (NIOSH, DFG).

ELIMINATION: The metabolites are excreted in the urine (DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is mildly to severely irritating for the eyes and skin of rabbits and rats (DFG, NIOSH).

SENSITIZATION: (SK/RESP): PGE causes skin sensitization in guinea pigs (DFG, NIOSH).

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: NAEL in dogs and rats (6 h/d; 5 d/w; 13 weeks) = respectively 12 (highest dose tested) and 1 ppm. Critical effects were skin thickening and alopecia (DFG, ACGIH).

LONG TERM TOX:

CARCINOGENICITY: Inhalation of 12 ppm PGE (6 h/d; 5 d/w; 24 months) caused nasal carcinomas in 9 of 84 male rats and in 4 of 89 female rats. No tumors were found at 1 ppm (DFG).

REPRODUCTION TOX: A reproduction and teratogenicity study with rats (at level up to 12 ppm) showed no effects. (Signs of degeneration of the testes were seen in all exposed groups, but it is doubtful whether this effect is related to exposure to PGE (NIOSH).)

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats, mice) = 2600-4256 and 1400 mg/kg respectively. Toxic signs include dyspnoea, and (reversible) depression of the central nervous system. The compound has a muscle relaxant effect (NIOSH). Death follows paralysis of the respiratory muscles (DFG, ACGIH). Microscopic examination revealed reversible changes in the liver and kidneys and necrotic foci in the mucous membrane of the stomach (NIOSH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rats, rabbits) = 2160 and 2990 mg/kg respectively. Toxic signs were hyperemia and necrosis of the skin and depression of the CNS (NIOSH).

4:MUTAGENICITY: PGE was positive in various mutagenicity tests: Ames tests with and without metabolic activation (DFG, NIOSH); a recombination test with E. coli without metabolic activation; a SOS-Chromotest with E. coli; in a fluctuation test with Klebsiella the compound was dose dependent mutagenic. PGE did not cause chromosomal aberrations in bone marrow cells of rats (11.2 ppm 6 h/d; 19 consecutive days, NIOSH) nor in vitro without metabolic activation, and it did not induce mutations in CHO-cells with or without S9-mix (DFG). Host mediated assays were positive (in two and one of five animals) after oral and im administration respectively, but after ip injection the assay was negative. The micronucleus test in mice and the

dominant lethal test (1; 5 and 12 ppm; 6 h/d; 19 days) in rats were negative. Oral administration of 500 mg/kg PGE did not disturb DNA synthesis in the testes of mice. PGE has alkylating properties with NBP and desoxyguanine in vitro, but no bonds with DNA were measured in vitro. PGE could transform (infected or not with SA7 virus) hamster embryocells without metabolic activation.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Workers have developed a severe dermatitis with second-degree burns, blisters and lesions which took a long healing period (DFG, NIOSH).

SENSITIZATION (SK/RESP): PGE is a primary allergen (DFG, ACGIH) with very strong sensitizing properties, and cross-sensitizing properties with related epoxy resins (NIOSH).

ACUTE TOX: Some authors conclude that because of the low toxicity and low vapor pressure, there is little risk from acute inhalation exposure under industrial conditions, unless PGE as aerosol is used (NIOSH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: PGE is sensitizing; it can cause nasal tumors in rats; it is positive in various genotoxicity and mutagenicity tests. Therefore PGE is listed on the IIIA2 list and no MAK is established. Because of the sensitizing properties and the good absorption through the skin, a skin and sensitizer notation are added.

ACGIH: TLV is based on direct skin effects and set at 1 ppm as suggested by some authors of a 1977 study.

NIOSH: Irritation has been reported in animals at concentrations of 5 ppm. "To provide an adequate safety margin, NIOSH recommends an environmental limit of 1 ppm, designated as a ceiling concentration for a 15-minute sampling period".

Casnr: 14484-64-1 Stofnaam: Ferbam
Synoniemen: Ferric dimethyldithiocarbamate

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:	-	15			BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: Melts and decomposes above 180 °C

VAPOR PRESSURE: mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake via digestive tract, lungs (inhalation of dust) and skin (SCG). Only trace amounts are found in body tissue.

BIOTRANSFORMATION:

ELIMINATION: Excretion of the products in the urine (mainly inorganic sulfate and glucuronide conjugate), faeces and exhaled air (as carbon disulfide) (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP): Ferbam is strongly sensitizing to guinea pigs and cross reacts with other dithiocarbamates (SCG).

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) > 17 g/kg (ACGIH).

SHORT TERM TOX: 5 mg/kg (= omgerekend 23 mg/m3) (30 days) caused no effects in rats; 250 mg/kg killed them (ACGIH).

LONG TERM TOX: Doses of 95 mg/kg (= omgerekend 437 mg/m3) (for 80 weeks) to rats caused hyperactivity and ataxia, followed by reduced motor activity, loss of muscle tonus and clonic spasms (SCG). 125 mg/kg daily for two years caused cystic brain damage and convulsions in rats. A beagle, receiving 25 mg/kg (= omgerekend 400 mg/m3) during one year also developed clonic spasms (SCG). ACGIH says: "dogs were not injured by 25 mg/kg per day for six months."

CARCINOGENICITY: 95 mg ferbam/kg/day during 80 weeks increased the frequency of thyroid metaplasia, but caused no hyperplasia in rats; it did not increase the frequency of cancer in mice or rats (SCG).

REPRODUCTION TOX: No effect on the fertility of male and female mice was found at a daily dose of 51 mg/kg (= omgerekend 230 mg/m3); daily 114 mg/kg given to pregnant mice reduced the weight of both mother and young (SCG).

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Ferbam is mutagenic to several strains of bacteria, with and without metabolic activation. It is toxic to hamster ovarian cells in vitro (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Inhalation effect appears to be on the upper respiratory tract and is consistent with irritation by an inert dust (ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect (in animals) = neurotoxicity. No human data.

ACGIH: TLV is the limit for "inert" dust.

Casnr: 12604-58-9 Stofnaam: Ferrovanadium (stof)
Synoniemen:

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	1			Ned:	Nee	
USA 1992:	-	1	-	3	USA:		
UK 1992:					UK:		UK:
BRD 1992:	-	1			BRD:		BRD:
Den 1992:	-	1			Den:		
Zwed 1990:					Zwed: Nee		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1480 - 1520 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Bij een blootstelling aan 10.000 ppm traden er nog geen acute intoxicatieverschijnselen op bij proefdieren.
SHORT TERM TOX: Een blootstelling om de dag van dieren gedurende twee maanden veroorzaakte pas bij een concentratie van 1000 tot 2000 mg/m3 ernstige pathologische veranderingen. Deze veranderingen bestonden uit chronische bronchitis en perialveolitis.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: Er wordt vermeld dat er Russische onderzoeken met vrijwilligers zijn gedaan, maar er worden geen resultaten vermeld.
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het advies van een Russische onderzoeker, die de onderzoeken met Ferrovanadium heeft uitgevoerd.

Casnr: 298-02-2 Stofnaam: Foraat
Synoniemen: O,O-Diethyl S-(ethylthio)methyl phosphorodithioate; T(h)imet

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,05			Ned: Ja		
USA	1992:	-	0.05		0.2	USA: Ja		
UK	1992:	-	0.05	-	0.2	UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,05			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 125 -127 °C (at 2 mm Hg).

VAPOR PRESSURE: about 0.002 mm Hg at 21 °C.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Foraat wordt via de orale, de respiratoire en de dermale route goed geabsorbeerd.

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mannelijke rat) = 2,3 mg/kg; (vrouwelijke rat) = 1,1 mg/kg.
SHORT TERM TOX: NEL (rat) = 0,05-0,15 mg/kg (= omgerekend 0,35 - 1,05 mg/m3);
(hond) = 0,01- 0,05 mg/kg (= omgerekend 0,07 - 0,35 mg/m3), waarbij het kritische effect een daling van het plasma- en erythrocyten-cholinesterase was. De lengte van de test wordt niet vermeld.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (mannelijke rat) = 6,2 mg/kg; (vrouwelijke rat) = 2,5 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de goede ervaringen met de stof in de praktijk.

Casnr: 7723-14-0 Stofnaam: Fosfor (geel)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	0.02	0.1			USA:		
UK	1992:	-	0.1	-	0.3	UK:		UK:
BRD	1992:	-	0,1	-	0,2C	BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: it is one of the most toxic inorganic substances.
MELTING POINT: 44 °C
BOILING POINT: 280 °C
VAPOR PRESSURE: 0.026 mm Hg (at 20 °C)

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Exposure of rats at more than 20 ppm (7 h/d; 5 d/w) caused severe respiratory irritation, lung edema and bronchiopneumonia with hyaline membrane formation, resulting in death. Exposure at 13-16 ppm phosphorus (7 h/d; 5 d/w; 4 months) did not cause any changes in growth of animals. Prolonged (?) exposure produced bone changes "uncomplicated by severe kidney or liver damage". P is distributed in lungs, bone, liver and kidney. Clearance from bone is slow. Also hair and skin absorb a considerable amount of phosphorus.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Daily injection of rats with 0.05 mg/kg of yellow phosphorus developed bone changes (omgerekend 0,23 mg/m3); 0.8 mg/kg caused an increased death rate (lowest dose tested). Subcutaneous doses of 0.1 mg/kg caused liver damage in dogs (omgerekend 1,6 mg/m3). Doses of 0.2-0.4 mg/kg resulted in death within a few days.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: A single dose of 1 mg/kg is lethal; 15 mg can cause severe toxic symptoms.

SHORT TERM TOX:

LONG TERM TOX: Phosphorus necrosis of the jaw have been reported among workers in the chemical and fireworks industries. Scrupulous dental hygiene seems likely to be very important for exposed employees.

EPIDEMOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is "probably sufficiently low to prevent acute poisoning, but may not provide a wide margin of safety from undesirable effects".

Casnr: 626-17-5 Stofnaam: Ftalodinitril (m-)
Synoniemen: Isophthalonitrile

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 141 °C
BOILING POINT: it sublimes

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: Dermal application of 0.5 mg/kg (= omgerekend 5,63 mg/m3) to intact or abraded skin of rabbits (6 h/d; 5 d/w; three weeks) remained without effects (hematology, pathology, urinalysis) except for occasional slight skin reactions. At 1.0; and 2.0 mg/kg there were some changes in organ size, without histopathologic changes. In the highest dose group females showed some loss in body weight.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT LONG TERM TOX: No reports of adverse effects were reported in a 15-year review of industrial experience with the compound.
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is set in light of the minimal or lack of effects "at relatively high levels by all routes of administration in animals" and in the light of industrial experience.

Casnr: 7782-65-2 Stofnaam: Germaniumtetrahydride
 Synoniemen: Germane; Germaniumhydride

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,2	0,6			Ned:		
USA 1992:	0.2	0.63			USA:		
UK 1992:	0.2	0.6	0.6	1.8	UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	0,2	0,6			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 MELTING POINT: -165 °C
 BOILING POINT: -88 °C

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:
 ACUTE TOX (LOC/SYST): Een konijn overleefde expositie aan 100 ppm, gedurende een uur; voor de muis was, bij een gelijke blootstellingsduur, 150 en 185 ppm fataal. Een cavia werd ziek bij blootstelling aan 150 ppm; een andere ging dood bij 185 ppm (1 uur). De stof schijnt hemolytische eigenschappen te hebben.
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION (SK/RESP):
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het idee dat de stof half zo toxisch is als antimoonwaterstof.

Casnr: 7440-58-6 Stofnaam: Hafnium
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,5			Ned:		
USA	1992:	-	0.5			USA:		
UK	1992:	-	0.5	-	1.5	UK:		UK:
BRD	1992:	-	0,5	-	5	BRD:		BRD:
Den	1992:	-	0,5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 2227 ± 20 °C

BOILING POINT: 4602 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION: Hafnium in de vorm van hafniummandelaat toegediend wordt langzaam uitgescheiden.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (muis) = 76 mg/kg.

SHORT TERM TOX: In een 90 dagen proef met ratten ontstond bij de meeste dieren de eerste reactie in de lever bij 1% hafniumtetrachloride in het voer, maar bij sommige dieren al bij een voedingsniveau van 0,1% (omgerekend MAEL = 350 mg/m3).

LONG TERM TOX: De stof is matig tot erg toxisch. Er ontstaat leverschade.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Intraperitoneaal toegediend is de stof acuut matig tot erg toxisch. LD50 iv (rat) van hafniummandelaat = 100 mg/kg; hafniumgluconaat = 2-3 g/kg.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op een omrekening/schatting vanuit het minimale respons niveau van de muis uit het 90 dagen onderzoek. De cie. stelt dat er op deze manier mogelijk een drievoudige veiligheidsfactor in de TLV waarde gebruikt is (?).

Casnr: 76-44-8 Stofnaam: Heptachloor
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,5			Ned: Ja	Nee	
USA	1992:	-	0.05			USA: Ja	A2	
UK	1992:	-	0.5	-	2	UK: Ja		UK:
BRD	1992:	-	0,5	-	5	BRD: Ja	IIIB	BRD:
Den	1992:	-	0,5			Den: Ja	R40	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 95 to 96 °C
BOILING POINT: 135 to 145 °C
VAPOR PRESSURE: 0.0003 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 40 - 188 mg/kg. Een eenmalige dosis van 45 mg/kg veroorzaakte bij ratten een stijging van 10% in de serum-esterase activiteit.
SHORT TERM TOX: Ratten, die dagelijks 125 ppm (= ongeveer 6 mg/kg; = omgerekend 42 mg/m3) gevoerd kregen, stierven binnen enkele dagen.
LONG TERM TOX: In een chronische proef, waarin honden dagelijks 1 mg/kg gevoerd werden, stierven de meeste dieren binnen een jaar na de start van de proef (omgerekend = 7 mg/m3 binnen een jaar letaal).
CARCINOGENICITY: In elf verschillende studies is de stof carcinogeen gebleken ook zijn er duidelijke aanwijzingen voor carcinogeniteit bij de rat.
REPRODUCTION TOX: Bij ratten, die 1 en 5 ppm gevoerd kregen ontstonden er afwijkingen bij de foetussen zowel in een vroege als in een late fase van de ontwikkeling.
OTHER STUDIES:

3.4:DERMAL: LD50 (rat) = 119-320 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Een onderzoeker schatte de toxische dermale dosis op 46 gram (eenmalige blootstelling).
SHORT TERM TOX: Bij herhaalde blootstelling zou de dermale toxische dosis 1,2 gram per dag zijn.
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV wordt geacht voldoende te beschermen tegen systemische intoxicatie.

Casnr: 77-47-4 Stofnaam: Hexachloorcyclopentadien
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,01	0,11			Ned:		
USA	1992:	0.01	0.11			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,01	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -9 °C

BOILING POINT: 238 °C

VAPOR PRESSURE: 0.08 mm Hg (at 25 °C)

ODOR THRESHOLD: 1.7 mg/m3.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): One to five exposure periods at levels ranging from 1.0 to 3.2 ppm were lethal for rabbits, mice, rats and guinea pigs.

SHORT TERM TOX: Exposure at 0.34 ppm (7 h/d; 5 d/w) was lethal for rats, mice and rabbits within 4 to 5 weeks, while all guinea pigs survived the exposures for 6 weeks. Exposure at 0.15 ppm (same regime, for 30 weeks) caused some degenerative changes in the liver and kidneys of all tested species and microscopic evidence of pulmonary irritation in mice. Four of five mice died when these exposures were prolonged. Other clinical symptoms were lacrimation, salivation, gasping respiration and tremors (at high concentrations).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): The irritating nature of the compound makes prolonged exposure intolerable.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should be sufficiently low to avoid all irritation and systemic toxicity.

Casnr: 1335-87-1 Stofnaam: Hexachloornaftaleen
Synoniemen:

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
Ned	1994:	-	0,2			Ned: Ja	Nee
USA	1992:	-	0.2			USA: Ja	
UK	1992:					UK:	UK:
BRD	1992:					BRD:	BRD:
Den	1992:	-	0,2			Den: Ja	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 137.22 °C

BOILING POINT: 343 to 387 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Mixtures of hexa- and pentachloronaphtalene are more toxic to animals than mixtures of penta- and tetrachloronaphtalene.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: The compound is more toxic in cattle than pentachloronaphtalene

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Exposure at mixed penta- and hexachloronaphtalene concentrations between 1 and 2 mg/m3 caused fatal cases of yellow liver atrophy.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is derived from the TLV of pentachloronaphtalene and is recommended in order to prevent liver damage and to minimize the incidence of chloracne.

Casnr: 684-16-2 Stofnaam: Hexafluoraceton
Synoniemen: HFA

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	0,1	0,7			Ned:	Nee	
USA 1992:	0.1	0.68			USA: Ja		
UK 1992:					UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	0,1	0,7			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -122 °C

BOILING POINT: -27 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: No unusual accumulation of the compound in the testes of rats occurred after injection

BIOTRANSFORMATION:

ELIMINATION: After injection in rats, most HFA is eliminated fast and unchanged.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Lethal concentration for rats (four hours exposure) is 300 ppm; 200 ppm damaged liver, kidney, testes and thymus; at 60 ppm damage at testes occurred which was still not reversed after 57 days.

SHORT TERM TOX: Daily 6 hour exposure at 60 ppm (10 exp.) resulted in decreased spermatogenesis and erythropoiesis in rats. NEL in rats (6 h/d; 5 d/w; 13 weeks) is 0.1 ppm. In dogs, the only effect at this level was an increase in lung weight. At 1 ppm reversible renal dysfunction occurred in rats and in dogs an increased lung weight. At 12 ppm severe but reversible testicular damage occurred in both tested species and a slight hypoplasia of the spleen, thymus and lymph nodes (in rats, also of the bone marrow).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: see: short term tox.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: NEL in dermal applications, (5 d/w; 2 weeks) in rats was 13 mg/kg. Effects at higher doses were testicular degeneration and atrophy. Changes in spermatogenesis were caused by inhibition of the Leydig cells.

NEL for fetal toxicity in rats (daily applications on day 6 to 16 of gestation) was 1 mg/kg. First toxic signs were reduction of fetal sizes. Litter size was reduced at 25 mg/kg/day. In spite of a small increase in soft tissue and external abnormalities "a definite teratogenic response could not be concluded".

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: 0.1 ppm was definitely a NEL. TLV of 0.1 ppm is recommended. "Plant experience to this point has not indicated any problems occurring at this exposure concentration".

Casnr: 121-82-4 Stofnaam: Hexogeen
Synoniemen: Cyclonite; RDX; Hexahydro-1,3,5-trinitro-1,3,5-triazine

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1,5			Ned: Ja	Nee	
USA	1992:	-	1.5			USA: Ja		
UK	1992:	-	1.5	-	3	UK: Ja		UK:
BRD	1992:					BRD: Nee		BRD:
Den	1992:	-	1,5			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: cyclonite are crystals
MELTING POINT: 205 to 206 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: De stof is geen acuut werkende toxische stof.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX: Ziekte ontstaat na herhaalde inhalatoire, gastrointestinale en dermale blootstellingen.
LONG TERM TOX: Bij 5 werknemers van een explosieven fabriek die werkten met cyclonite traden verschijnselen van de kant van het CZS op, zoals misselijkheid, braken, convulsies en bewusteloosheid. Deze verschijnselen komen overeen met de symptomen bij dieren.
In een vestiging waar de werknemers blootgesteld werden aan 1,5 mg cyclonite/m3 werd beperkte, maar goede ervaringen mbt gezondheid opgedaan.
EPIDEMIOLOGICAL STUDIES: In een epidemiologische studie waar de werknemers blootgesteld waren aan een 8-uur TWA concentratie die opliep tot 1,57 mg/m3, met een gemiddelde van 0,28 mg/m3, konden geen abnormaliteiten geconstateerd worden.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie met TNT. Bovendien stelt de cie. dat bewezen is dat deze grens beschermt tegen schade.

Casnr: 108-84-9 Stofnaam: Hexylacetaat (sec-)
Synoniemen: 1,3-Dimethylbutylacetaat; Methylisoamylacetaat

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	300			Ned:		
USA	1992:	50	295			USA:		
UK	1992:	50	300	100	600	UK:		UK:
BRD	1992:	50	300	100C	600C	BRD:		BRD:
Den	1992:	50	300			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -64 °C

BOILING POINT: 146.3 °C

VAPOR PRESSURE: 3 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Bij een 4 uur durende blootstelling aan 4000 ppm stierven twee van de zes ratten en bij 8000 ppm stierven ze allemaal.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Bij expositie aan 100 ppm trad er bij mensen oogirritatie op en klaagde men over een onplezierige geur en smaak.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op een advies uit 1946 van onderzoekers die de humane gegevens hadden gepubliceerd.

Casnr: 999-61-1 Stofnaam: Hydroxypropylacrylaat (2-)
Synoniemen: HPA

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,5	3			Ned: Ja		
USA 1992:	0.5	2.8			USA: Ja		
UK 1992:	0.5	3			UK: Ja		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	0,5	3			Den: Ja		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 77 °C at 5 mm Hg.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Direct oogcontact veroorzaakt oogbrandwonden. De stof is corrosief voor de huid.

SENSITIZATION: (SK/RESP): Enige vorm van sensitizatie treedt op bij cavia's.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Blootstelling aan 650 ppm gedurende 7 uur was niet dodelijk voor ratten.

SHORT TERM TOX: In een 30 dagen studie bij ratten, honden, konijnen en muizen; 7u/d; 6d/w veroorzaakte het laagste blootstellingsniveau van 5 ppm enige irritatie.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 0,25-0,5 g/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (konijn) = 0,25 mg/kg

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Na een mild huidcontact ontstonden er geen symptomen.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op irriterende effecten van de stof.

Casnr: 13463-40-6 Stofnaam: IJzerpentacarbonyl
Synoniemen: Pentacarbonyliron; Jernpentacarbonyl (Deens)

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,01	0,08			Ned:		
USA	1992:	0.1	0.23	0.2	0.45	USA:		
UK	1992:	0.01	0.08			UK:		UK:
BRD	1992:	0,1	0,8	0,2	1,6	BRD:		BRD:
Den	1992:	0,1	0,8			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -20 °C

BOILING POINT: 103 °C

It is decomposed by light to Fe₂(CO)₉ and CO.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure to 18 ppm for 5.5 hours was lethal to 4 of 8 rats, causing lung edema. NEL was 7 ppm.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY: There is no evidence that iron pentacarbonyl has caused carcinogenic effects in experimental animals.

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Exposure to high concentrations causes headache, dizziness, followed in 12 to 36 hours by symptoms of fever, cyanosis, cough and shortness of breath. Primary effects are on the lungs, but degenerative changes in the CNS have also been reported.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: There is no evidence that iron pentacarbonyl has caused carcinogenic effects in man.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV of 0.01 ppm was originally recommended because of its acute toxicity and because of its suspected potential for carcinogenic activity. Based on the above data, 0.1 ppm is believed to be more adequate to protect against acute and chronic systemic effects.

Casnr: 102-54-5 Stofnaam: IJzerzout van dicyclopentadien
Synoniemen: Dicyclopentadienyl iron; Ferrocene

	tg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	10			Ned:	Nee	
USA 1992:	-	10			USA:		
UK 1992:	-	10	-	20	UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:					Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 173 °C

BOILING POINT: sublimes above 100 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: De stof heeft "haematinic" (???) eigenschappen bij dieren. LD50 (muis) = ongeveer 600 mg/kg (omgerekend LC50 = 4200 mg/m3). In een andere publicatie wordt de letale dosis gelijk aan 1000 mg/kg genoemd (geen verwijzing). SHORT TERM TOX: Tien toedieningen van 200 mg/kg verspreid over 2 weken, veroorzaakte geen sterfte in 6 proefdieren (valt niet om te rekenen).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is overgenomen van een advies afkomstig van een Manual, van de US Public Health Service (geen verwijzing). Hierin wordt aangegeven dat ijzer een van de hoogste achtergrond concentraties heeft van alle metalen.

Casnr: x Stofnaam: IJzerzouten (in water oplosbaar)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	1	-	2	UK:		UK:
BRD	1992:	-				BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: various
BOILING POINT: various

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na inhalatie zijn ferri-zouten in stof- of mistvorm irriterend voor de luchtwegen. Ferri-zouten irriteren ook op de huid.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: IJzerzouten zijn na orale opname laag tot matig toxisch. Ze veroorzaken duidelijke gastrointestinale irritatie.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: De ijzerzouten, met name de ferri-zouten zijn toxisch voor proefdieren indien intraveneus toegediend. De acute letale dosis, (iv) voor het konijn = 7,2 mg/kg.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Acute letale dosis wordt geschat op 30 gram ferri-zouten.
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV zou de kans op luchtweg- en huidirritatie moeten verkleinen.

Casnr: 95-13-6 Stofnaam: Indeen
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	10	45			Ned:	Nee	
USA	1992:	10	48			USA:		
UK	1992:	10	45	15	70	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	10	45			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -3.5 °C.

MELTING POINT: -1.8 °C.

BOILING POINT: 182 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): De stof is irriterend voor de luchtwegen en de mucosae, maar niet voor de huid (zie ook: DERMAL)

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Een expositie van ratten aan 800-900 ppm gedurende 7 uur veroorzaakte leverschade en af en toe milt- en nierbeschadigingen. Bij sectie werden er ernstige levernecrose met bloedingen gevonden bij enkele dieren. In de nieren werden focale necrosehaarden gevonden, hetgeen leek op kleine infarcten. Er waren geen veranderingen in bloedsamenstelling, bijnieren, pancreas, hypofyse, ovarium en testes. Er vielen geen doden.

Aspiratie van de vloeistof kan aanleiding geven tot een chemische pneumonie, longoedeem en bloedingen.

In een Russische studie werd de acute toxiciteitsgrens voor de rat op 200 mg/m3 gesteld.

SHORT TERM TOX: Continue blootstelling van ratten aan 3 mg/m3 gedurende 105 dagen, veroorzaakte stimulatie van het bloed cholinesterase en remming van catalase. Bij 0,6 mg/m3 werden geen toxische effecten gevonden.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Na een eenmalige toediening van 1 gram vertoonden volwassen konijnen geen toxische symptomen.

Ratten, die 2,5 ml van een 1:1 v/v mengsel in olijfolie toegediend kregen, stierven allen. Bij sectie waren er karakteristieke veranderingen in de lever, longen en maagdarmkanaal aanwezig.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Subcutane injectie in ratten van 1 gram, resulteerde in leververvetting en sterfte.

3.4:DERMAL: Een tot acht applicaties van 0,1 ml van de vloeistof bij het konijn; en drie applicaties van 0,5 ml bij de cavia veroorzaakten geen locale, noch systemische effecten.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Op grond van analogie met gerelateerde monoaromatische koolwaterstoffen, bestaat de verwachting dat de stof irriterend is voor mucosae. Kwantitatief inhalatoir onderzoek op dit gebied onbreekt echter. Door herhaald of langdurig huidcontact kunnen de natuurlijke vetten en olie verdwijnen, waardoor een dermatitis kan ontstaan.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV wordt geacht de ernstige systemische effecten van overexpositie te voorkomen. De waarde is vastgesteld naar analogie met de irriterende eigenschappen van naphthalene.

Casnr: 123-51-3 Stofnaam: Isoamylalcohol
Synoniemen: 3-Methylbutaan-1-ol; Pentanol-isomeren

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							serend
Ned	1994:	100	360			Ned:	
USA	1992:	100	361	125	452	USA:	
UK	1992:	100	360	125	450	UK:	UK:
BRD	1992:	100	360	200	720	BRD:	BRD:
Den	1992:	100	360			Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES: Both primary and secondary isoamylalcohol are discussed.

MELTING POINT: -117.2 °C (primary)

BOILING POINT: 132 °C (primary); 113 °C (secondary)

VAPOR PRESSURE: 2 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 5,7 mg/kg (prim.) (=omgerekend 26,2 mg/m3). Toxicity was twelve times that of ethyl alcohol.

SHORT TERM TOX:

LONG TERM TOX: "No chronic toxicity is to be expected".

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Unacclimated persons reported slight throat irritation at 100 ppm. Higher concentrations caused objectionable eye, nose and throat irritation.

SENSITIZATION (SK/RESP):

ACUTE TOX: Most important effect is narcosis.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is set at 100 ppm according to some author who stated that this level "is low enough to prevent significant narcosis, but not to prevent slight irritation".

Casnr: 110-19-0 Stofnaam: Isobutylacetaat
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	150	700			Ned:		
USA	1992:	150	713			USA:		
UK	1992:	150	700	187	875	UK:		UK:
BRD	1992:	200	950	400C	1900C	BRD:		BRD:
Den	1992:	150	710			Den:		
Zwed	1990:	100	500	150	700	Zwed:		Zwed:

The literature has been reviewed by the SCG for this compound, but no information was found regarding its possible biological effects.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -99 °C

BOILING POINT: 116 °C

VAPOR PRESSURE: 13 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure to 4000 ppm (4-hours) caused no deaths in rats; to 8000 ppm killed four of six rats.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): In low concentrations, isobutylacetate was somewhat less irritating than n-butylacetate.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

TLV is the same as for n-butylacetate and should prevent irritation of the eyes and respiratory passages.

Casnr: 26952-21-6 Stofnaam: Isooctylalcohol
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	270			Ned:		
USA	1992:	50	266			USA: Ja		
UK	1992:	50	270			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	50	270			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: < -76 °C

BOILING POINT: 185 °C

VAPOR PRESSURE: 0.36 mmHg at 20 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Isooctylalcohol wordt geglucuronideerd.

ELIMINATION: De oraal opgenomen stof wordt bij konijnen voor bijna 90% als glucuronide in de urine uitgescheiden.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Huidirritatie is matig.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Bij blootstelling van ratten aan 235 ppm gedurende 6 uur, vielen geen doden.

Ratten die gedurende 8 uur aan een "geconcentreerde damp" werden blootgesteld overleefden allen.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat en muis) = 3,2-6,4 g/kg (omgerekende LC50 humaan = 22,4 - 44,8 mg/m3). LD50 ip (rat en muis) varieert in de literatuur van <0,4-1,6 g/kg. LD50 (rat) = 2,46 ml/kg (concentratie is niet bekend).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (cavia) = >10 ml/kg. LD50 (konijn) = 2,38 ml/kg (concentratie is niet bekend). Uitgaande van de veronderstelling dat de zuivere vloeistof is gebruikt, komt men op een LD50 van <2 g/kg; de door de TLV gebruikte grens voor "skin notatie". (sg = 0,834.)

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is niet gemotiveerd. De TLV is gelijk aan die van de USSR.

Casnr: 75-31-0 Stofnaam: Isopropylamine
Synoniemen: 2-Aminopropaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5	12			Ned:		
USA	1992:	5	12	10	24	USA:		
UK	1992:					UK:		UK:
BRD	1992:	5	12	10	24	BRD:		BRD:
Den	1992:	5	12			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -101 °C
BOILING POINT: 32.4 °C
VAPOR PRESSURE: 478 mm Hg (at 20 °C)
ODOR THRESHOLD: 0.5 to 2.9 mg/m3

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake by respiratory and digestive tract and skin (SCG).
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): A concentrated solution was severely irritating to the skin of rabbits, as was 1% to the eyes (SCG).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure to 9600 mg/m3 (4-hours) killed all exposed rats.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Short exposures to 20 - 50 mg/m3 is irritating to eyes and nose and throat. Most important effect of inhalation is irritation of the respiratory tract with lung edema as the maximal injury (ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Exposed workers have complained of visual disturbances (halo phenomenon), which usually dissappeared 3 to 4 hours after termination of exposure (no level).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: no data available; critical effect is irritation.
ACGIH: TLV should protect the respiratory tract.

Casnr: 768-52-5 Stofnaam: Isopropylaniline (N-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	2	10			Ned: Ja		
USA	1992:	2	11			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	2	10			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 135.2 °C

BOILING POINT: 202 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na direct contact ontstaan lichte huid- en oogeffecten.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 0,25-0,5 g/kg (omgerekende LC50 humaan = 1750 - 3500 mg/m3).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie met die voor aniline en N,N-dimethylaniline. Er wordt nl gesteld dat de toxiciteit van gealkyleerde benzeenderivaten niet essentieel veranderd is vergeleken met de "oorspronkelijke" benzeenderivaten.

Casnr: 75-47-8 Stofnaam: Jodoform
Synoniemen: Trijoodmethaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,2	3			Ned:		
USA	1992:	0.6	10			USA:		
UK	1992:	0.6	10	1	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,2	3			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 119 °C

BOILING POINT: decomposes at high temperatures with evolution of jodine

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX: No adequate study of chronic toxicity has been reported.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD0 (dogs) = 1000 mg/kg (= omgerekend 16.000 mg/m3). It indicates that iodoform is somewhat more toxic than bromoform.

SHORT TERM TOX:

LONG TERM TOX: Body weight and survival were affected at high doses (in a carcinogenicity study). "It would appear that iodoform is not highly toxic systemically, although histopathological examination was inadequate".

CARCINOGENICITY: It was not carcinogenic at the tested dose (?).

REPRODUCTION TOX:

OTHER STUDIES: Subcutaneous LD0 (rabbits) = 50 mg/kg.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: a generally accepted industrial air standard is not available.

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should be used with caution, as there seems to be little pertinent use experience with the compound. It is roughly comparable to that of methyl iodide on an iodine basis and is slightly above that of bromoform.

Casnr: 1310-58-3 Stofnaam: Kaliumhydroxide
Synoniemen:

		tg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	2C			Ned:	Nee	
USA	1992:	-	2C			USA:		
UK	1992:			-	2	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	2C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: ~ 360 °C

BOILING POINT: 1320 to 1324 °C

VAPOR PRESSURE: 1 mm Hg (at 719 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to dust or mist may cause irritation of the eyes and respiratory tract and lesions of the nasal septum. KOH is extremely corrosive to tissue.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: "Because KOH is extremely corrosive to tissue, a ceiling limit of 2 mg/m3 is recommended".

Casnr: 76-22-2 Stofnaam: Kamfer (synthetisch)
Synoniemen: Bornan-2-on

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	2	12			Ned:		
USA	1992:	2	12	3	19	USA:		
UK	1992:	2	12	3	18	UK:		UK:
BRD	1992:	2	13			BRD:		BRD:
Den	1992:	2	12			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 178.8 °C (pure)
BOILING POINT: 204 °C
VAPOR PRESSURE: 0.18 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Kamfer veroorzaakt convulsies door stimulering van de cerebrale cortex. Bij sectie worden congestie en oedemateuze veranderingen in de nieren, het maagdarmkanaal en de hersenen gevonden.
SHORT TERM TOX: Langdurige blootstelling aan 6 mg/m3 kan bij dieren leiden tot ernstige schade.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY: In een carcinogeniteitsproef werden dieren (?) 1 keer per maand, 18 maanden lang SUBCUTAAN ingespoten met een zodanige hoeveelheid kamfer dat er een bult ontstond van 3 mm. Er ontstonden geen tumoren.
REPRODUCTION TOX:
OTHER STUDIES: LD50 ip (muis) kg. Acute toxiciteitsverschijnselen van kamfer treden op in ratten (ip) bij 900 mg/kg en in muizen (sc) bij 2200 mg/kg.

3.4:DERMAL: Indien kamfer in een 0,3-3% acetonoplossing met crotonolie 1 keer per week op de huid werd aangebracht, ontstond er bij 2 van de 110 dieren een carcinoom, waarvan een carcinoom invasief was.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Intoxicaties in de arbeidssituatie met verschijnselen als coma, dyspneu en hoofdpijn zijn beschreven. Er is een fataal geval bekend van een intoxicatie met de damp van verhitte kamfer, waarbij duidelijke stijfheid van de kaakspieren optrad (bron is niet erg duidelijk; wellicht uit 1931).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: Werknemers, die maximaal 10 maanden; 5 dagen per week blootgesteld waren aan 2 ppm of minder, vertoonden geen irritatie van ogen en neus, noch verlies van het reukvermogen. Bij lichamelijk onderzoek werden geen signifidaan, behalve neus- en keelontstekingen.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de bevindingen van de werknemers die blootgesteld waren aan 2 ppm of minder. De TLV zou moeten beschermen tegen neus- en oogirritatie en reukverlies.

Casnr: 463-51-4 Stofnaam: Ketenen
Synoniemen: Ethenone; Carbomethaan

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 0,5	0,9			Ned:		
USA	1992: 0.5	0.86	1.5	2.6	USA:		
UK	1992: 0.5	0.9	1.5	3	UK:		UK:
BRD	1992: 0,5	0,9	1C	1,8C	BRD:		BRD:
Den	1992: 0,5	0,9			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
SOLIDIFIES: -151 °C
BOILING POINT: -56 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Keteen is een van de meest irriterende gassen voor de luchtwegen.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Keteen heeft een vertraagde reactie op de luchtwegen (vergelijkbaar met fosgeen). LC50 (muis) = 17 ppm, waarbij de expositieduur 10 minuten bedroeg.

Bij blootstellingen aan 5 ppm of meer gedurende 10 minuten zou er een hoge mate van tolerantie optreden, zowel voor de acute effecten van keteen als voor andere stoffen die longoedeem kunnen veroorzaken. Deze grens van 5 ppm wordt beschouwd als de laagste concentratie die nog een fysiologische reactie opwekt.

SHORT TERM TOX: Verschillende diersoorten werden gedurende 6 u/d; 5 d/w; 6 maanden lang blootgesteld aan 1 ppm. De dieren ondervonden ogenschijnlijk geen chronische schade. Een vergelijkbaar resultaat werd gevonden, dacht men (..was believed obtained..) in dieren waaronder apen, die 55 exposities van 7 uur ondergingen. De studie bevatte echter analytische onzekerheden, waardoor de conclusies voorlopig waren.

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:

SHORT TERM TOX:
LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: (Humane gegevens??) Er zou toenemend bewijs zijn dat het optreden van chronische longveranderingen (emphyseem en fibrosis) in verband kan worden gebracht met het ontstaan van tolerantie voor acuut longoedeem.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de vergelijking met fosgeen, ervan uitgaande dat fosgeen op de lange duur iets schadelijker is dan keteen.

Casnr: 7440-48-4 Stofnaam: Kobalt (stof en rook)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,05			Ned:		
USA	1992:	-	0.05			USA:		
UK	1992:	-	0.1			UK:		
BRD	1992:	-	-	-	-	BRD:	IIIA2	UK:
Den	1992:	-	0,05			Den:		BRD: Ja
Zwed	1990:	-	0,05			Zwed:		Zwed: Ja

In most cases cobalt does not occur alone; mostly it involves mixed exposure to other metals (SCG).

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 1495 °C

BOILING POINT: 2870 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Occupational exposure occurs mostly via inhalation of dust and mists containing cobalt (SCG). It does not accumulate in the lungs (SCG), but lung clearance happens in three fases of wich the slowest fase has a halftime of 60 to 120 days (DFG). One third of the inhaled CoO in hamsters is absorbed. In man, between 5 and 45% of oral taken cobalt is absorbed in the digestive tract. The recommended daily intake is 0.12 ug. Highest tissue concentration is in the liver, mostly as vitamine B12.

BIOTRANSFORMATION:

ELIMINATION: (In man:) Primarily through the kidneys, but partly also in faeces.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP): Co is a strong allergen in guinea pigs (SCG).

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Single instillation of 1 mg cobalt metal, resulted within 6 hours in lung edema and bronchiolitis in rats. The changes were completely reversed after three months (DFG).

SHORT TERM TOX: Exposure of miniature swine to 0.1 and 1.0 mg Co dust/m3 (6 h/d; 5 d/w; three months) resulted in pulmonary disease (eg decrease in lung compliance) and changes in ECG's, comparable to those associated with cardiomyopathy.

Continuous exposure (three months) of rats to 0.005 mg Co/m3 was irritating the lungs and 0.001 mg/m3 still showed weak signs of intoxications. At higher concentrations (0.05 and 0.5 mg/m3) resp. thyroid disfunction and epithelial hyperplasia in the thyroid were found (DFG).

LONG TERM TOX:

CARCINOGENICITY: Inhalation tests of cobaltoxide (10 mg/m3; 7 h/d; 5 d/w; life long) with goldhamsters were negative (DFG). Intratracheal instillation of 2 and 10 mg/kg cobalt oxide (39 doses in about 120 weeks) proved to be carcinogenic in rats (DFG).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Feeding 20 mg cobaltsulfate/kg/day during five weeks to guinea pigs caused degeneration of the myocard (DFG). In experiments cobalt affects the central nervous system of insects and fish, but no such results are found in mammals.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Cobalt can pass the placenta in man and animal. Until now there are no indications for teratogenicity or embryotoxicity of the metal(compounds) (DFG).

OTHER STUDIES: Ip injection of 2.5 mg Co/kg (as cobaltchloride) for 63 days damaged the heart (DFG).

Im, sc or bone marrow-injection of metallic cobalt, cobalt oxide and cobalt sulfide induced local tumors in rats (SCG, DFG). Rabbits did and mice did not develop local tumors after im injection of cobalt dust.

3.4:DERMAL:

4:MUTAGENICITY: A battery of mutagenicity tests, cobalt compound (mostly used compound cobalt chloride) was generally, although weakly, positive (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Concentrations of 0.005 - 0.01 mg Co/m3 in a

hard-metal-production process caused irritation of eyes, nose and throat (SCG). SENSITIZATION (SK/RESP): Allergic contact eczema is well documented (ACGIH), eg after exposure to cement, hard metal or nickel (money), impurified with cobalt (SCG). Also the asthma has an allergic background (DFG).

ACUTE TOX: Exposure to 0.06 mg Co/m³ in hard-metal-dust produced a slight acute bronchial constriction, that did not disappear overnight. Exposure to 0.1 - 2.0 mg Co/m³ in hard-metal-dust caused dry coughing (SCG), whereas 1 to 2 mg/m³ caused more serious and sometimes fatal responses. The lung changes, which improved often after stopping the exposure, had probably a hypersensitivity background (ACGIH). After reduction of exposure concentrations at or below 0.1 mg/3, no new cases of systemic cobalt disease or dermatitis have occurred (ACGIH).

SHORT TERM TOX: In some cases of anemia cobalt treatment led to increased production of erythrocytes, but also to increased incidence of goitre (SCG, DFG).

LONG TERM TOX: A few cases of lung fibrosis have been reported, as a result of occupational exposure at hard-metal-dust (SCG, DFG, ACGIH) (mixed exposure to 2 to 10.5 mg dust/m³!) with cobalt concentration of 0.1 to 2 mg/m³. After 11 years exposure to less than 0.02 mg/m³ TWA, no lung fibrosis developed (SCG). Exposure to 0.05 to 0.1 mg Co/m³ caused a higher frequency of asthma. Exposure to 0.01 - 0.06 mg Co/m³ did not reveal any effects on the ECG, although some authors suggest that occupational exposure to cobalt can cause cardiomyopathy (SCG, DFG).

EPIDEMIOLOGICAL STUDIES: There are no indications in the literature that occupational exposure to cobalt may involve a risk for cancer (SCG, DFG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical organ is the respiratory tract. Long term exposure to concentrations of 0.05 - 0.1 mg Co/m³ can cause chronic effects (asthma). Heart effects need further studies.

DFG: Although test- circumstances were not fully comparable to those in occupational exposure, cobalt needs a IIIA2 notation.

ACGIH: In view of the serious nature of the results in the mini-pig study, after a relatively short exposure period, TLV of 0.05 mg/m³ is recommended, with a STEL of 0.1 mg/m³. "This recommendation is still under review by the Committee." These TLVs "do not apply generally to cobalt compounds, for which no TLV s have been adopted."

Casnr: 10210-68-1 Stofnaam: Kobaltcarbonyl
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
SOLIDIFIES: at room temperature.
MELTING POINT: 50 °C (decomposition begins).

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Ratten, die gedurende 1 uur blootgesteld werden aan 1400 mg/m3 vertoonden geen toxische effecten.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 753,8 mg/kg; (muis) = 377,7 mg/kg (omgerekende LC50
humaan = resp. 5277 en 2644 mg/m3).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is voldoende om tegen acute effecten te beschermen, volgens de cie. Er wordt verwacht dat de TLV ook wel tegen chronische effecten en carcinogeniteit zal beschermen.

Casnr: 16842-03-8 Stofnaam: Kobalhydrocarbonyl
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: -		0,1			Ned:		
USA	1992: -		0.1			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992: -		0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -26 °C

BOILING POINT: decomposes rapidly at room temperature.

VAPOR PRESSURE: very high.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rat) = 165 mg/m3 bij expositie gedurende 30 minuten.
De stof produceert vergelijkbare klinische verschijnselen als nikkel- en ijzerpenta-carbonyl, maar de acute toxiciteit van kobalhydrocarbonyl is ongeveer de helft van die van nikkelcarbonyl.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV zou moeten beschermen tegen acute- en chronische effecten van de stof.

Casnr: x Stofnaam: Kolenstof
Synoniemen: Koldamm (Zweeds); Coal dust

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2			Ned:		
USA	1992:	-	2*			USA:		
UK	1992:	-	2*			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:	-	3			Zwed:		Zwed:

The SCG document "discusses only those effects that can be associated with coal dust: it does not discuss quartz or other substances (such as sulfur, nitrogen and metals) occurring in coal."

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Inhaled Particles > 5-7 µm are transported to the throat and swallowed; particles < 5-7 µm are deposited in the lower respiratory tract, engulfed by macrophages and transported from the lung tissue (SCG).

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX: Rats, who were exposed to coal dust of different qualities in concentrations of 6.6 to 14.9 mg/m3 (6 h/d; 5 d/w), developed lesions typical of coal worker's pneumoconiosis (CWP) (SCG).

CARCINOGENICITY: No tumor incidence was reported in any animal study (SCG).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: SCE (in peripheral lymphocytes of rats), Micronucleus test (in bone marrow cells) and Ames test (with urine samples) of two year-exposed rats and mice (to 2 mg coal dust/m3) were negative (SCG).

5:OBSERVATIONS IN MAN: "Coal miners have and have had considerably higher exposure to coal dust than other workers who normally handle coal".

IRRITATION (SK/MM/EY/RESP): Coal dust combined with sweat (moisture) can irritate the skin (SCG).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: 20 to 35% of the mine workers with a CWP eventually developed the more serious and sometimes debilitating progressive massive fibrosis (PMF). The risk of developing PMF depends on the total amount of inhaled dust; the quartz content of the dust; the presence of tuberculosis or immunological factors. Also other chronic obstructive lung diseases can develop. It is estimated (with numerous reservations) that worklife-time exposure to 2 mg/m3 provides 1% risk of developing CWP or more serious lung problems (SCG). The estimated NEL (in which the effect is development of the least serious form of pneumoconiosis; 35 years exposure) is 1.6 mg/m3 (ACGIH). The propositions that exposure to coal dust causes stomach cancer or lung cancer cannot be supported by several epidemiological studies (SCG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is pneumoconiosis. There is no increased risk for cancer.

ACGIH: TLV is based on the epidemiological data, showing that an estimated TLV-TWA of 1.6 mg/m3 is the NEL.

Casnr: 7440-50-8 Stofnaam: Koper (rook)
Synoniemen:

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	0,2			Ned:		
USA 1992:	-	0.2			USA:		
UK 1992:	-	0.2			UK:		UK:
BRD 1992:	-	0,1	-	0,2	BRD:		BRD:
Den 1992:	-	0,1			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 1083 °C

BOILING POINT: 2336 °C

VAPOR PRESSURE: 10 mm Hg (at 1870 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Some fraction of inhaled copper can be absorbed by the circulatory system. Absorption via intact skin is extremely small. Daily oral intake is 2 - 5 mg (DFG). Accumulation could occur when daily intake increases to 20 mg (SCG).

BIOTRANSFORMATION:

ELIMINATION: Excretion increases with increased intake. It is primarily excreted via the gall bladder and faeces. Calculated halving time in healthy adults is about four weeks.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Continuous exposure to CuO-aerosol in concentrations of 0.1 to 1.0 mg/m3 (90 to 100 days) caused an increase in hemoglobin and erythrocytes and changes in the serumprotein-fraction in rats (SCG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Continuous exposure to CuO-aerosol in concentrations of 0.1 to 1.0 mg/m3 (90 to 100 days) proved to be toxic for the gonads of rats (SCG).

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 of various copper-compounds in rats vary from 159 to 940 mg/kg (SCG).

SHORT TERM TOX:

LONG TERM TOX: Long term administration of 500 ppm coppersulfate in the feed of rats, caused a reduction in growth rate (= omgerekend 115 mg/m3); 4000 ppm was lethal for the animals. Post mortem, degenerative changes of the liver, kidneys and spleen were found (SCG).

CARCINOGENICITY:

REPRODUCTION TOX: Copper can pass through the placenta to the embryo (SCG).

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Lowest concentration of copper dust reported to cause irritation in the upper respiratory tract is 0.12 mg/m3 (SCG, DFG); concentrations lower than 0.008 mg/m3 did not cause symptoms (DFG). Coppersalts can cause conjunctivitis, ulceration and clouding of the cornea (DFG).

SENSITIZATION (SK/RESP): Probably allergic eczema may occur, but is rare (DFG, SCG).

ACUTE TOX: Primary acute symptoms (high dose) are diarrhea and vomiting.

Hemolysis can also occur, mostly after more prolonged exposure (SCG).

Intoxications from occupational inhalation of copper smoke or dust are rare because of the low solubility of the copper. Health effects can occur however and are reported at concentrations of 0.12 mg/m3 copper dust. They include irritation of the upper respiratory tract, metal fume fever, nausea, metallic or sweet taste and sometimes discoloration of the hair and skin (ACGIH, SCG, DFG). Industrial experience supports another view that NEL is 0.4 mg/m3 (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: From the available information it can be concluded that smoke from copper or copperoxide in concentrations higher than 0.1 mg/m³ can cause acute, reversible disturbances.

SCG: Critical effects are irritation of the upper respiratory tract and "metal fume fever". The finer the smoke/dust, the earlier the effects can be observed. Lowest irritating concentration for copper dust is 0.12 mg/m³.

ACGIH: TLV would appear to be sufficiently low to protect against irritation.

Casnr: 7440-50-8 Stofnaam: Koper (stof)
Synoniemen:

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							serend
Ned	1994: -	1				Ned:	
USA	1992: -	1				USA:	
UK	1992: -	1	-	2		UK:	UK:
BRD	1992: -	1	-	2		BRD:	BRD:
Den	1992: -	1				Den:	
Zwed	1990: -	1*				Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 1083 °C

BOILING POINT: 2336 °C

VAPOR PRESSURE: 10 mm Hg (at 1870 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Some fraction of inhaled copper can be absorbed by the circulatory system. Absorption via intact skin is extremely small. Daily oral intake is 2 - 5 mg (DFG). Accumulation could occur when daily intake increases to 20 mg (SCG).

BIOTRANSFORMATION:

ELIMINATION: Excretion increases with increased intake. It is primarily excreted via the gall bladder and faeces. Calculated halving time in healthy adults is about four weeks.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Continuous exposure to CuO-aerosol in concentrations of 0.1 to 1.0 mg/m3 (90 to 100 days) caused an increase in hemoglobin and erythrocytes and changes in the serumprotein-fraction in rats (SCG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Continuous exposure to CuO-aerosol in concentrations of 0.1 to 1.0 mg/m3 (90 to 100 days) proved to be toxic for the gonads of rats (SCG).

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 of various copper-compounds in rats vary from 159 to 940 mg/kg (SCG).

SHORT TERM TOX:

LONG TERM TOX: Long term administration of 500 ppm coppersulfate in the feed of rats, caused a reduction in growth rate (= omgerekend 115 mg/m3); 4000 ppm was lethal for the animals. Post mortem, degenerative changes of the liver, kidneys and spleen were found (SCG).

CARCINOGENICITY:

REPRODUCTION TOX: Copper can pass through the placenta to the embryo (SCG).

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Lowest concentration of copper dust reported to cause irritation in the upper respiratory tract is 0.12 mg/m3 (SCG, DFG); concentrations lower than 0.008 mg/m3 did not cause symptoms (DFG). Coppersalts can cause conjunctivitis, ulceration and clouding of the cornea (DFG).

SENSITIZATION (SK/RESP): Probably allergic eczema may occur, but is rare (DFG, SCG).

ACUTE TOX: Primary acute symptoms are diarrhea and vomiting. Hemolysis can also occur, mostly after more prolonged exposure (SCG). Intoxications from occupational inhalation of copper smoke or dust are rare because of the low solubility of the copper. Health effects can occur however and are reported at concentrations of 0.12 mg/m3 copper dust. They include irritation of the upper respiratory tract, metal fume fever, nausea, metallic or sweet taste and sometimes discoloration of the hair and skin (ACGIH, SCG, DFG). Industrial experience supports another view that NEL is 0.4 mg/m3 (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: From the available information it can be concluded that respirable dust of copper or cuperioxide in concentrations higher than 1 mg/m³ can cause acute, reversible disturbances.

SCG: Critical effects are irritation of the upper respiratory tract and "metal fume fever". The finer the smoke/dust, the earlier the effects can be observed. Lowest irritating concentration for copper dust is 0.12 mg/m³.

ACGIH: TLV would appear to be sufficiently low to protect against irritation.

Casnr: 1344-36-1 Stofnaam: Leisteen
 Synoniemen:

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:		10*			Ned:		
USA	1992:					USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Geen TLV bepaald; geen onderbouwing aanwezig.

Casnr: 7580-67-8 Stofnaam: Lithiumhydride
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,025			Ned:		
USA	1992:	-	0.025			USA:		
UK	1992:	-	0.025	-	1	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,025			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 680 °C

DECOMPOSITION: ~ 500 °C

VAPOR PRESSURE: 0 mm Hg (at 20 °C)

In contact with water, the alkaline lithiumhydroxide is formed, which is responsible for the irritating properties of the compound (DFG, ACGIH).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Exposure to 5 mg/m3 resulted in irritation of eyes, respiratory tract (resulting in lung emphysema) and mucous membranes (DFG, ACGIH); levels over 10 mg/m3 eroded the fur and skin on the legs of the animals and destructed the external nasal septum (ACGIH). The effects were completely reversible (ACGIH).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Only one very poor documented study is found, in which the LD0 = 10 mg/m3 (four hours; rats) (DFG).

SHORT TERM TOX: LD0 in rats and mice is 5.4 mg/m3 (total exposure-time is 20 hours within one week, with two weeks observation time). Toxic symptoms result from irritation of the eyes, mucous membranes and respiratory tract (DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to 0.05 mg/m3 is reported to be "unpleasant", but habituation occurs. Concentrations of 0.1 mg/m3 or higher were dose dependent irritating the eyes and mucous membranes of the upper respiratory tract; 0.5 mg/m3 was only bearable for a short period (DFG, ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX: A few milli-equivalents of the Lithium ion in the plasma gives rise to serious signs of and symptoms referable of the nervous system, including anorexia, nausea, tremor, apathy, mental confusion, coma and death (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: There are not enough data to set a MAK-Wert. Further research is urgently needed.

ACGIH: TLV is suggested as a tolerable atmospheric level to prevent nasal irritation.

Casnr: x Stofnaam: LPG
Synoniemen: Liquefied Petroleum Gas

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1000	1800			Ned:		
USA	1992:	1000	1800			USA:		
UK	1992:	1000	1800	1250	2250	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: -0.56 to 4.44 °C
VAPOR PRESSURE: 1575 TO 6450 mm Hg (at 20 °C).

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): LPG kan fungeren als een eenvoudige asphyxiant, maar het kan ook depressie van het CZS veroorzaken.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Concentraties van 100.000 ppm kunnen getolereerd worden, maar veroorzaken duizeligheid binnen enkele minuten.
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Er zijn geen chronische systemische effecten bekend van professionele blootstelling aan LPG. TLV is gebaseerd op "Good Industrial Hygiene Practice". Het moet de kans op brand of explosies minimaliseren.

Casnr: 546-90-0 Stofnaam: Magnesiumcarbonaat
 Synoniemen: Magnesiet

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Geen onderbouwing aanwezig.

Casnr: 1309-48-4 Stofnaam: Magnesiumoxide (rook)
Synoniemen:

		tgq		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	6	-	12	BRD:		BRD:
Den	1992:	-	6			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 2800 °C

BOILING POINT: 3582 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to MgO dust (concentration?) caused light irritation to eyes and nose (DFG).

SENSITIZATION (SK/RESP):

ACUTE TOX: LC0 = 400 mg/m3 (DFG). Exposure to 15-29 mg/m3 for 5 to 9 minutes caused a raise in body temperature in two of four volunteers and an increase in white blood cells; metal fume fever (DFG). According to ACGIH, the concentration to which the volunteers were exposed was 400-600 mg/m3!

SHORT TERM TOX:

LONG TERM TOX: Exposure to high MgO smoke concentrations during 9 years repeatedly resulted in symptoms as evening-fevers, with sweating and coughing, together with (mostly reversible) thickening of the lungparenchyma. No concentrations given (DFG).

EPIDEMIOLOGICAL STUDIES: There is no proof of carcinogenicity of the compound (DFG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: MgO smoke is more dangerous than MgO dust. For MgO smoke the MAK for respirabel dust is set, which should protect against metal fume fever and other adverse effects on the respiratory tract.

ACGIH: TLV for nuisance particulates is recommended; this "is believed adequate to protect workers from any adverse health effects".

Casnr: 12079-65-1 Stofnaam: Mangaancyclopentadienyltricarboonyl
Synoniemen: Tricarbon(etacyclopentadienyl)manganese; MCT

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1	-	0,3	Ned:	Ja	
USA	1992:	-	0.1			USA:	Ja	
UK	1992:	-	0.2	-	0.6	UK:	Ja	UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
No data.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: De stof is zonder metabole activering toxisch werkzaam.

ELIMINATION: De stof heeft duidelijke cumulatieve eigenschappen.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na dermale applicatie is de stof lokaal mild irriterend.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Tachtig % van de ratten, die gedurende 2 uur blootgesteld werden aan 120 mg/m3 stierven. Bij 20 tot 40 mg/m3 overleefden alle ratten, cavia's en konijnen die gedurende 2 uur aan deze concentratie werden blootgesteld.

SHORT TERM TOX: Laboratoriumdieren die 11 maanden lang, 4 u/d blootgesteld werden aan gemiddeld 1 mg/m3, vertoonden geen uitwendige symptomen van intoxicatie, maar 7 maanden na het begin van het experiment was de neuromusculaire excitatiedrempel voor elektrische stimuli gestegen. Nierschade bleek uit een verlaagde urineproductie en proteinurie. De weerstand tegen infecties was ook gedaald.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: MCT veroorzaakt convulsies en longoedeem in de rat; ED50 (convulsies) = 32 mg/kg; ip: EC50 = 20 mg/kg. LD50 = 22 mg/kg; LD50 (ip) = 14 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Na herhaalde (?) intraperitoneale toediening van de stof bij muizen en ratten ontstond selectieve necrose (??; selectric neurosis?) van de bronchiale niet-trilhaarepitheelcellen, en een wisselende beschadiging van het longparenchym. (Deze informatie is uit een Russisch(?) tijdschrift gehaald).

3.4:DERMAL: Muizen, die 5 keer 2 uur per dag met hun staart in een oplossing van MCT in benzine gehangen werden, vertoonden geen hogere mortaliteit dan een groep muizen die in pure benzine gehangen werden. Beide groepen dieren kregen na 4 exposities kleine bloedinkjes rond de staartwortel, die later samenvloeiden. Inhalatie van benzinedampen werd voorkomen door de dieren aan de rand van een "rookkast" te zetten met de neuzen naar de deur. Bovengenoemde effecten konden blijkbaar toegeschreven worden aan de benzine.

MCT als een olie-emulsie toegepast op bepaalde delen van de huid bij het konijn, veroorzaakte een zekere graad van irritatie.

Tetrahydrofuraan-oplossingen van MCT bleken veel toxischer te zijn dan MCT in olie, vooral bij hoge blootstellingen. Dieren wiens staart in een oplossing van MCT in tetrahydrofuraan gehangen werden, stierven binnen een uur, terwijl controledieren met hun staart in pure tetrahydrofuraan, allemaal overleefden.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is overgenomen van de USSR.

Casnr: 141-79-7 Stofnaam: Mesityloxyde
Synoniemen: 4-Methylpent-3-en-2-on; Isobutenyl methylketone

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	15	60			Ned:		
USA	1992:	15	60	25	100	USA:		
UK	1992:	15	60	25	100	UK:		UK:
BRD	1992:	25	100			BRD:		BRD:
Den	1992:	10	40			Den:		
Zwed	1990:					Zwed:		Zwed:

NIOSH has prepared a criteria document on various ketones, including mesityl oxide. This document is not available in the department.
NIOSH REL: 10 ppm; 40 mg/m3.

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -41.5 °C
BOILING POINT: 129.6 °C
VAPOR PRESSURE: 9.5 mm Hg (at 25 °C)
ODOR THRESHOLD: 0.017 ppm

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Ketones in general can be absorbed via the skin and the lungs (SCG).
BIOTRANSFORMATION: Ketones in general can be reduced to alcohol or oxidized to hydroxyketones, diketones and carbon dioxide (SCG).
ELIMINATION: Metabolites of ketones in general can be eliminated by the kidneys as glucuronide conjugates (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The undiluted solution is severely irritating for the eyes and skin (SCG).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure to 500 ppm (8-hours) was lethal for 30% of exposed guinea pigs and rats. Exposure to 6000 ppm was lethal to mice within about 23 minutes. All the animals died after showing convulsions and coma.
Rabbits exposed at 13000 ppm for 30 or 90 minutes only experienced irritation of nose and eyes.
SHORT TERM TOX: NEL in rats and guinea pigs (8 h/d; 5 d/w; 6 weeks) is 50 ppm. Exposure to 100 or 250 ppm showed dose-dependent narcotic effects, blood congestion in the liver and lungs and swelling of tubular epithelium in the kidneys (SCG, ACGIH). Rabbits exposed to 25 ppm (4 h/d; 189 days) developed anemia and leucopenia (SCG).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat and rabbit) = 1120 and 1000 mg/kg respectively (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: Application of 0.5 ml mesityl oxide resulted in 100% deaths within 9 hours (SCG). Repeated skin contact can cause dermatitis (SCG).

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to 25 ppm caused irritation of the eyes; at 50 ppm also the nose became irritated and the odor was experienced as unpleasant (SCG, ACGIH).
SENSITIZATION (SK/RESP):
ACUTE TOX: exposure to 100 ppm caused eye and mucous membrane irritation, difficulty in breathing, headache and vertigo (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is difficult to establish. Very irritating liquid!

ACGIH: TLV reflects the greater systemic toxicity as well as the irritant effects of mesityl oxide, in comparison with other ketones.

Casn: 74-93-1 Stofnaam: Methaanthiol
 Synoniemen: Methylmercaptaan

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,5	1			Ned:		
USA	1992:	0.5	0.98			USA:		
UK	1992:	0.5	1			UK:		UK:
BRD	1992:	0,5	1	1C	2C	BRD:		BRD:
Den	1992:	0,5	1			Den:		
Zwed	1990:					Zwed:		Zwed:

NIOSH has prepared a criteria document on thiols, including methanethiol. This document is not available on the department.
 NIOSH REL = 0.5 ppm Ceiling limit (15 min.).

1:PHYSIOCHEMICAL PROPERTIES:

SOLIDIFIES: -123 °C
 BOILING POINT: 6.2 °C
 VAPOR PRESSURE: 1691 mm Hg (at 20 °C)
 ODOR THRESHOLD: 0.01 to 0.04 ppb

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Methyl mercaptan is easily absorbed by the lungs.
 BIOTRANSFORMATION: methyl mercaptan is a normally occurring metabolite in man, used in the synthesis of new methionine and other substances. It can be broken down into carbon dioxide and inorganic sulfate (half time in rats is 1.2 hours).
 ELIMINATION: Surplus methyl mercaptan and carbon dioxide are exhaled. The inorganic sulfate is excreted in the urine.

3:ANIMAL EXPERIMENTS: Methyl mercaptan acts, like hydrogensulfide, on the respiratory center producing death by respiratory paralysis (ACGIH).

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):
 SHORT TERM TOX: Exposure to 2; 17 and 57 ppm (7 h/d; 5 dw; three months) caused a dose-dependent reduction in body weight and liver damage in rats (SCG).
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Irritation of lungs and mucous membranes can occur.
 SENSITIZATION (SK/RESP):

ACUTE TOX: Exposure to 4 ppm (estimated) for several hours caused headache and vomiting, which disappeared after 24 hours. In more serious cases (hemolytic) anemia, methemoglobinemia, respiratory arrest, coma and death can occur (ACGIH, SCG).

SHORT TERM TOX:

LONG TERM TOX: Workers who were exposed to methyl mercaptan, methyl disulfide and hydrogensulfide (concentrations were at the time of the study respectively 0.07-2.0; 0.03-3.2 and 0.05-5.2 ppm) for at least ten years, showed effects on heme synthesis and higher absence from work (SCG).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "Critical effect is the discomfort caused by the odor."

ACGIH: TLV is based on the strong and unpleasant odor of methyl mercaptan.

Casnr: 16752-77-5 Stofnaam: Methomyl
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2,5			Ned: Ja	Nee	
USA	1992:	-	2.5			USA:		
UK	1992:	-	2.5			UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	2,5			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 78 to 79 °C

VAPOR PRESSURE: 0.00005 mm Hg (at 25 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: De stof wordt snel gemetaboliseerd, zodat de cholinesterase-remmende werking snel stopt.

ELIMINATION: Mannelijke ratten die gelabeld methomyl gevoerd werden, elimineerden bijna alle stof binnen 24 uur. Een dag na de toediening werd tien % of minder in de lichamen en organen teruggevonden. In de urine en uitgeademde kooldioxide werd het meeste radioactieve materiaal aangetroffen.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Applicatie van een 60% pasta in propyleenglycol; een 5% oplossing in propyleenglycol; of een 5% oplossing in water bij cavia's, resulteerde in verwaarloosbare huidirritatie.

Applicatie van de droge stof; of een 10% oplossing in propyleenglycol in de ogen van konijnen, veroorzaakte op de dag van toediening een lichte conjunctivitis en geïnjecteerde bloedvaten van de iris. Er trad geen corneabeschadiging op, wel de verwachte miosis.

SENSITIZATION: (SK/RESP): In bovenstaand huidexperiment ontstond geen sensitizatie.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 van de ongeformuleerde stof (diersoort?) = 300 mg/m3 bij een expositieduur van 4 uur. Bij blootstelling van ratten aan een 90% wateroplosbare formulering, met partikels die kleiner waren dan 10 microns, was de letale concentratie ongeveer 450 mg/m3. Vier uur blootstelling aan de verzadigde damp veroorzaakte geen doden.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 25-40 mg/kg. Bij honden, die de helft van een letale dosis kregen, zonder antidoot, waren de symptomen binnen twee uur weg en waren de cholinesterase spiegels in minder dan vier uur op het normale niveau terug. SHORT TERM TOX: Tien toedieningen van 5,1 mg/kg in een periode van twee weken, gaf geen aanwijzingen voor cumulatieve toxiciteit. Bij ratten die gedurende 79 dagen 0; 200; 400 en 800 ppm gevoerd kregen, was er alleen een lichte verlaging van de cholinesterase bloedspiegel te vinden in de 800 ppm groep (omgerekende NEL = 140 mg/m3).

Beagles van beide sexen, die gedurende 90 dagen 0; 50; 100 en 400 ppm methomyl gevoerd kregen, vertoonden geen verschijnselen voor toxiciteit van de stof. Bij 1000 ppm werden wel toxische verschijnselen gevonden (omgerekende NEL = 100 mg/m3).

LONG TERM TOX: In een 2 jaar proef met Beagles van beide sexen, waarbij de dieren 0; 50; 100 en 400 ppm gevoerd kregen, zijn geen bewijzen voor toxiciteit van de stof gevonden. Dieren die 1000 ppm gevoerd kregen vertoonden wel toxische verschijnselen. In een vergelijkbare proef van 22 maanden met ratten, werden bij deze dieren histopathologische veranderingen aangetroffen in de nieren, milt en lever, bij hogere voedingsniveaus. De NEL voor ratten en honden werd vastgesteld op 100 ppm (omgerekende NEL = resp. 35 en 24,5 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 van een 52,8% (brijige) waterige substantie = >5000 mg/kg; en voor een 24% vloeibare formulering = 5880 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: De LC50 van 3000 mg/m³ gedeeld door de TLV van 2,5 geeft een veiligheidsfactor van 120. Dit vindt de cie. voldoende gezien het snelle metabolisme van methomyl.

Casnr: 150-76-5 Stofnaam: Methoxyfenol (4-)
Synoniemen: Hydroquinon monomethyl ether

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 53 °C
BOILING POINT: 243 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Direct contact veroorzaakt een matige corneabeschadiging. Langdurig huidcontact veroorzaakt brandwonden.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 1-2 g/kg.
SHORT TERM TOX: Een orale dier(?)proef van twee maanden toonde een No-Ill-Effect-Level van 0,1 ppm ("about 50 mg/kg/day"). (aangenomen dat het ratten betreft is de omgerekende NIEL uitgaande van 0,1 ppm: 0,035 mg/m3, en uitgaande van 50 mg/kg: 350 mg/m3).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: LD50 (konijn) = > 1 g/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld vanwege oog- en huideffecten en naar analogie met hydroquinon op 5 mg/m3.

Casnr: 79-20-9 Stofnaam: Methylacetaat
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	200	610			Ned:		
USA	1992:	200	606	250	757	USA:		
UK	1992:	200	610	250	760	UK:		UK:
BRD	1992:	200	600	400C	1200C	BRD:		BRD:
Den	1992:	200	610			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

SOLIDIFIES: -98 °C

BOILING POINT: 56.9 °C

VAPOR PRESSURE: 173 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Door hydrolyse van methylacetaat ontstaat methanol; meting van deze stof in de urine geeft bruikbare informatie over de blootstelling aan methylacetaat. De toxiciteit van methylacetaat wordt geweten aan het ontstaan van methanol in het lichaam.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Methylacetaat veroorzaakt irritatie van de mucosae van de ogen, en van de bovenste en onderste luchtwegen. Bij wat voor soort expositie is niet duidelijk; lokaal contact of inhalatoir.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX: Blootstelling aan 6600 ppm resulteerde in veranderingen in het bloed, gewichtsverlies, longirritatie en enige sterfte. (diersoort niet bekend, de rest overigens ook niet; niet eens of het eigenlijk wel om een dierproef gaat.)

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: De stof werkt zwak narcotiserend. Er ontstonden oog- en nerveuze storingen bij werknemers die blootstonden aan methylacetaatdamp. Er ontstonden onder andere oogontstekingen, nerveuze irritatie en druk op de borst.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de suggestie dat de toxiciteit van methylacetaat ontstaat na omzetting in methanol. Er zijn geen gevallen bekend van irritatie of systemische schade door industriële blootstelling aan minder dan 200 ppm.

Casnr: 74-99-7 Stofnaam: Methylacetyleen
Synoniemen: Propyn; allyleen

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	1000	1650			Ned:		
USA	1992:	1000	1640			USA:		
UK	1992:					UK:		UK:
BRD	1992:	1000	1650	2000C	3300C	BRD:		BRD:
Den	1992:	1000	1650			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
FREEZING POINT: -101.5 °C
CONDENSATION POINT: -23.1 °C
VAPOR PRESSURE: 3800 mm Hg (at 20 °C)

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX: Twee honde en twintig ratten werden gedurende 6 maanden; 5 d/w; 6 u/d blootgesteld aan 28.700 ppm methylacetyleen. Tijdens de proef stierven er 8 ratten en hadden beide honden drie aanvallen van convulsies. Toxiciteitsverschijnselen bij de dieren waren excitatie, ataxie, speekselen, mydriasis en tremoren. De groeisnelheid was verlaagd. Bij sectie was er irritatie van de longen te vinden.

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SON (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op het ene beschreven experiment (uit 1956) en op "good industrial hygiene practice".

Casnr: x Stofnaam: Methylacetyleen/propadieenmengsel
Synoniemen: MAPP-gas

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1000	1800			Ned:		
USA	1992:	1000	1640	1250	2050	USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	1000	1800			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -136 °C
BOILING POINT: -34.5 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX: Ratten, konijnen, honden en cavia's werden gedurende 4 maanden; 5 d/w; 7 u/d blootgesteld aan 5000 ppm van het mengsel. Er werden geen veranderingen gevonden op het gebied van voorkomen; groei; hematologische effecten; macro- en microscopische veranderingen; serum ureum waarden in honden en alkalische fosfatase en serum GT in ratten, konijnen en honden. Bij meting van de orgaangewichten werden er lagere longgewichten gemeten. Bij dieren op dezelfde manier blootgesteld aan 1000 ppm, werden helemaal geen veranderingen aangetroffen.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de vermelde gegevens en naar analogie met methylacetyleen.

Casnr: 126-98-7 Stofnaam: Methylacrylnitril
Synoniemen: Methacrylonitril; 2-Methyl-2-propenenitrile

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	3			Ned: Ja		
USA	1992:	1	2.7			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	1	3			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -35.8 °C
BOILING POINT: 90 °C
VAPOR PRESSURE: 40 mm Hg (at 12.8 °C)

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Na applicatie van 2,0 ml/kg op de huid van een konijn, trad er minimale huidirritatie op. Een druppel op het oog was meteen irriterend, maar het oog werd binnen 1 uur weer normaal. Een andere onderzoeker noemt de oogirritatie minimaal.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Letale concentratie bij muizen is 800 ppm bij 30 minuten blootstelling en 230 ppm bij 8 uur blootstelling. De dieren stierven door verstikking, terwijl er bij sectie geen macroscopisch opvallende veranderingen te vinden waren. LC50 (rat) = iets minder dan 1000 ppm, bij 4 uur blootstelling. In een ander onderzoek was de LC50 (muis en konijn) = 36-37 ppm; (cavia) = 88 ppm; (rat) = > 300 ppm. Honden die aan 50-100 ppm blootgesteld werden gedurende 3-7 uur, stierven. Bij sectie werden geen macroscopische lesies gevonden.
SHORT TERM TOX: Ratten werden 7 u/d; 5 d/w in totaal 9 keer blootgesteld aan 20; 50 en 110 ppm. Op de eerste dag stierven er 2 van de 12 ratten. Aan het einde van de proef waren er geen veranderingen in groeisnelheid, noch in macroscopisch opzicht te constateren. Een(!) hond werd volgens hetzelfde schema blootgesteld aan 20 ppm, in totaal 8 keer. De dieren(!) braakten op de eerste dag en hadden 20% gewicht verloren na de laatste expositie. Bij sectie werden er geen macro- of microscopische afwijkingen gevonden.
Ratten werden 7 u/d; 5 d/w in totaal 91 keer, blootgesteld aan 109,3; 52,3 en 19,3 ppm. De eerste dag stierven er 7 mannetjes van de hoogste expositiegroep; op de tweede dag stierf een mannetje van de 52,3 groep. Bij sectie werden er geen macro- of microscopische veranderingen geconstateerd. De gewichtstoenames en de levergewichten waren verminderd in de twee hoogste expositiegroepen. Men concludeerde dat vrouwelijke ratten minder gevoelig waren dan de mannelijke en dat de NEL lag tussen 52,3 en 19,3 ppm. Bij honden die volgens een zelfde schema blootgesteld werden aan 3,2; 8,8 en 13,5 ppm, werd er ongeveer halverwege de proefperiode bij 2 van de 3 honden uit de hoogste expositiegroep, effecten van de kant van het CZS gezien (convulsies en motorisch controleverlies in de achterpoten). In een van de honden werden microscopische lesies gevonden in de hersenen. Op de vijfde dag ontstond diarree. In de 8,8 ppm groep was er op dag 21 sprake van een voorbijgaande verhoging van het serum transaminase. Verder werden er geen significante veranderingen of doden gevonden. De NEL werd vastgesteld tussen 8,8 en 3,2 ppm.

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Een intragastrale (en intraperitoneale) dosis van 15 mg/kg was letaal bij de muis. LD50 (rat) = 0,2-0,24 g/kg (2 studies). Een andere beschreven LD50 voor muizen en ratten = resp. 20-25 en 25-50 mg/kg (blootstellingsduur?). Blootstelling gedurende 2 uur aan 9880 ppm was dodelijk voor alle blootgestelde ratten.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: Applicatie van 2,0 ml/kg was in 3 uur letaal bij konijnen. LD50

(konijn) = 0,32-0,35 ml/kg (2 studies).

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de short term hondenproef van 90 dagen en op vergelijkingen (analogie) met acrylonitril.

Casnr: 108-87-2 Stofnaam: Methylcyclohexaan
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	400	1600			Ned:		
USA	1992:	400	1610			USA:		
UK	1992:	400	1600	500	2000	UK:		UK:
BRD	1992:	500	2000	1000	4000	BRD:		BRD:
Den	1992:	400	1600			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -127 °C

BOILING POINT: 100.8 °C

VAPOR PRESSURE: 40 mm Hg (at 22 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Aromatic hydrocarbons are in general more irritating than the corresponding aliphatic compounds.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure at 7500 to 10,000 ppm (two hours) caused extreme exhaustion in mice. Exposure at 10,000 to 12,500 ppm was lethal. Exposure at 1200 and ("prolonged" exp.) at 370 ppm was harmless for respectively rabbits and monkeys. Histologic changes resemble those resulting from exposure at cyclohexane.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is the same as for heptane, which has comparable acute toxicity.

Casnr: 25639-42-3 Stofnaam: Methylcyclohexanol
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	235			Ned:		
USA	1992:	50	234			USA:		
UK	1992:	50	235	75	350	UK:		UK:
BRD	1992:	50	235	100	470	BRD:		BRD:
Den	1992:	50	235			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 25 °C

BOILING POINT: 155 to 180 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Fifty exposures (six hours) at 120 ppm resulted in barely discernible microscopic changes in liver and kidney in rabbits. Higher exposure levels (500 ppm) caused salivation, conjunctival irritation and slight lethargy.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rabbits) = 1.25-2 g/kg. Surviving animals showed liver damage.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Prolonged exposures at excessive concentrations can result in irritation of the ocular and upper respiratory membranes.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Prolonged exposures at excessive concentrations can result in headache.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is set at 50 ppm to prevent possible effects on the liver and kidneys. Some author (Smyth!) stated that a level of 100 ppm was low enough to prevent narcotic effects and most likely would not cause significant damage to liver and kidneys.

Casnr: 583-60-8 Stofnaam: Methylcyclohexanon (o-)
Synoniemen: alle isomeren

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	230			Ned: Ja		
USA	1992:	50	229	75	344	USA: Ja		
UK	1992:	50	230	75	345	UK: Ja		UK:
BRD	1992:	50	230	100	460	BRD: Ja		BRD:
Den	1992:	50	230			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -19 °C

BOILING POINT: between 160 and 170 °C

VAPOR PRESSURE: 10 mm Hg (at 55 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Concentrations of 450 ppm were irritating to the eyes and respiratory passages of mice. In rabbits exposed at 514 ppm, slight conjunctival congestion was found. 182 ppm showed no effects.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): At 2500 ppm exposed rabbits and cats showed sleepiness, difficult and irregular respiration and uncertain and staggering gait. Exposure at 2890 ppm for four hours killed three of six rats.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rabbits) = 1-1,25 g/kg. LD50 (rats) = 1,98 g/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rats) = 1.64 g/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Levels of 100 ppm may still cause eye and respiratory irritation.

SENSITIZATION (SK/RESP):

ACUTE TOX: It is not considered a hazardous material in industry. Critical effects are irritation at lower levels and narcosis at high concentrations. Patty states that 100 ppm may still cause complaints of eyes and respiratory irritation.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent eye and respiratory irritation and narcotic effects.

Casnr: 12108-13-3 Stofnaam: Methylcyclopentadienylmangaantricarbonyl
Synoniemen: Tricarbonyl(methylcyclopentadienyl)mangaan, CI-2

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,1	0,2			Ned: Ja		
USA	1992:	-	0.2			USA: Ja		
UK	1992:	-	0.2	-	0.6	UK: Ja		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,1	0,2			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

In a US Navy report it says: "In the present state of knowledge the use of this agent is legally justifiable only on the grounds of military necessity. There is no information on prolonged effects."

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: 2.22 °C

BOILING POINT: 231.67 °C

VAPOR PRESSURE: 7.3 mm Hg (at 100 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: CI-2 in the concentrated form penetrates the skin very rapidly. Gasoline solutions, or when blended with other fuels, are not as readily absorbed and have therefore a lower order of toxicity.

BIOTRANSFORMATION:

ELIMINATION: After inhalation, more than 95 % of the absorbed CI-2 is excreted within two or three days in the urine.

3:ANIMAL EXPERIMENTS: Primary site of action is the central nervous system.

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): One hour LC50 (rat) = 350 mg/m3. Toxic symptoms included mild excitement, hyperactivity, tremors, severe clonic spasms, weakness, slow and labored respirations, convulsions and terminal coma. Animals who survived the convulsions, lost weight and died after a few days. Animals who survived the exposure recovered in two to six weeks. At necropsy, hyperemic viscera, petechial hemorrhages in the lungs, degeneration and necrosis of the liver and renal tubules and degeneration of the cerebral cortex were found, together with nonspecific vascular changes in the lungs.

SHORT TERM TOX: Exposure at 12 mg/m3 (100 days; continuously?) caused no weight loss, nor any pathological changes in two dogs. Higher exposures, caused chronic bronchitis, peribronchitis, interstitial pneumonia and lung abscesses.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 23 and 39 mg/kg, depending on sex.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rabbits) = 1692 ±145 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: Skin contact should be avoided.

IRRITATION (SK/MM/EY/RESP): CI-2 is moderately irritating to the eyes.

SENSITIZATION (SK/RESP): CI-2 is not known to cause cutaneous sensitization.

ACUTE TOX: 5-15 ml of the compound, spoiled on the skin of a worker, caused "thick tongue", giddiness, nausea and headache within three to five minutes.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is two times the value for tetraethyl lead, since they appear to be similar in toxicity, and lead is the more toxic.

Casnr: 8022-00-2 Stofnaam: Methyldemeton
Synoniemen: Demetonmethyl; Methylmercaptophos

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,5			Ned:	Ja	
USA	1992:	-	0.5			USA:	Ja	
UK	1992:					UK:		UK:
BRD	1992:	0,5	5	5	50	BRD:	Ja	BRD:
Den	1992:	0,05	0,5			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: it is a mixture of the thiol and the thiono (70%) isomers.

MELTING POINT: It is a liquid at room temperature.

BOILING POINT: 93 °C at 0.5 mm Hg (thiono); 102 °C at 0.4 mm Hg (thiol).

VAPOR PRESSURE: 0.0000185 mm Hg (thiono); 0.00036 mm Hg (thiol) (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): De inhalatoire toxiciteit van de alkylsulfonium producten, die ontstaan bij opslag van verdunde oplossingen van methyl-s-demeton is vergelijkbaar (dus zeer toxisch) met hun intraveneuze toxiciteit.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 40-65 mg/kg (omgerekend 280 - 455 mg/m3) en 180-250 mg/kg (omgerekend 1260 - 1750 mg/m3) voor resp. methyl-s-demeton en methyl-o-demeton. Tijdens opslag van de verdunde oplossing kan er alkylering van methyl-s-demeton optreden, waardoor er alkylsulfonium producten ontstaan. De LD50 (diersoort?) van de alkylsulfonium producten = 10-20 mg/kg (omgerekend 70 - 140 mg/m3). Intraveneus toegepast zijn deze producten zeer toxisch; LD50 = 0,02-0,07 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (diersoort?) = ongeveer 400 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Methyldemeton veroorzaakt veranderingen in intra-oculaire druk in verschillende lagen van het oog. Bij acute intoxicatie treden er verschijnselen op als misselijkheid, hoofdpijn, duizeligheid, braken en hyperemie van het neusslijmvlies.

SHORT TERM TOX:

LONG TERM TOX: Bij chronische exposities ontstaan hyperemie van de slijmvliesen van de luchtwegen en irritatie van het binnenoor.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld naar analogie met demeton.

Casnr: 1338-23-4 Stofnaam: Methylethylketonperoxide
Synoniemen: MEKP; Butanonperoxide

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							serend
Ned	1994:	0,2C	1,5C			Ned:	
USA	1992:	0.2C	1.5C			USA:	
UK	1992:			0.2	1.5	UK:	UK:
BRD	1992:	-	-	-	-	BRD:	BRD:
Den	1992:	-	1C			Den:	
Zwed	1990:	0,2C	1,5C			Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 75 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION: The breakdown of peroxides creates free radicals with possible subsequent lipid peroxidation, destruction of enzymes or changes in nucleic acids (SCG).
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP): In rabbits, the highest not irritating solution of MEKP in dimethyl phtalate is 1.5% for the skin, and 0.6% for the eyes. Higher concentrations can cause considerable skin damage (SCG, ACGIH).

3.2:INHALATION:
ACUTE TOX (LOC/SYST): LC50 (rats and mice; (four hours)= respectively 200 and 170 ppm. (ACGIH). Inhalation of MEKP (no dose given) resulted in coughing and gasping in rats (ACGIH). Exposure for four hours at MEKP vapors, resulted commonly in hyperemia with petechiae and gross hemorrhages in the lungs, and occasionally in histopathological changes in the liver and kidneys of rats (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 in rats = 484 mg/kg
SHORT TERM TOX: Thrice weekly administration of one fifth of the oral LD50 (this is 97 mg/kg) killed all rats so the compound cumulated in the body.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX: After injection into chicken eggs, the compound had a moderate embryotoxic effect (mortality and teratogenicity) (SCG).
OTHER STUDIES: LD50 ip in rats = 65 mg/kg.

3.4:DERMAL:

4:MUTAGENICITY: A few positive mutation tests with bacteria are reported for MEKP (SCG).

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP): The compound is supposed to be skin sensitizing, but no reliable, confirming studies have been reported; One positive patch test with MEKP is reported. (SCG).
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:
SCG: Critical effect is irritation of the mucous membranes. "There are no reliable data from which to determine promotive or allergenic effects".
ACGIH: A ceiling limit of 1.5 mg/3 is recommended because it is more toxic than benzoyl peroxide and resembles hydrogen peroxide in toxicity and irritancy.

Casnr: 624-83-9 Stofnaam: Methylisocyanat
Synoniemen: MIC; Isocyanic acid-methyl ester

		tg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,02	0,05			Ned: Ja	Nee	
USA	1992:	0.02	0.047			USA: Ja		
UK	1992:	-	0.02M	-	0.07M	UK:		UK: Ja
BRD	1992:	0,01	0.025	0,02C	0,05C	BRD:		BRD: Ja
Den	1992:	0,01C	0,03C			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 49 °C (!!!)
BOILING POINT: 39.1 °C (!!!)
VAPOR PRESSURE: 348 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): MIC is a severe lung irritant (ACGIH).
SENSITIZATION: (SK/RESP): 0.01 ml of a 0.01% solution of MIC caused a 100% positive sensitization reaction in guinea pigs (ACGIH).

3.2:INHALATION:

ACUTE TOX (LOC/SYST):LC50 in guinea pigs, rats and mice (six hours exp.) = respectively 5.4; 6.1 and 12.2 ppm (ACGIH). Clinical signs included lacrimation, respiratory difficulty, decreased activity and hypothermia. These signs persisted for more than one week. MAEL was 2.4 ppm, with reduced body weight as the only effect in these groups. NEL was 0.1 ppm (ACGIH).
SHORT TERM TOX: NAEL in rats (6 h/d; two periods of four days with two days in between) was 0.58 ppm; at 3.07 ppm there were multiple lesions throughout the respiratory tract (inflammation and meta- and hyperplasia) and a decrease in absolute liver, kidney and testes weight (without any lesions). 85 days post-exposure, the lesions were decreased in severity and frequency.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 in male rats = 71 mg/kg when administered as a 10% solution in a light petroleum distillate (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: LD50 in rabbits = 211 mg/kg. Hemorrhage and marked edema of the skin resulted (ACGIH).

4:MUTAGENICITY: Ames test was negative (ACGIH).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure for one minute to 1.75 ppm; or for ten minutes to 0.05 ppm was irritating eyes, nose and throat. MIC is a skin irritant and can cause permanent eye damage on direct contact (ACGIH).
SENSITIZATION (SK/RESP): No direct evidence for pulmonary sensitization was found, but other isocyanates are known sensitizers (ACGIH).
ACUTE TOX: Acute symptoms include asthma, chest pain, pulmonary edema, dyspnea, respiratory failure and death (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

HSE: Critical effect is respiratory sensitization, for which no NEL could be established. Therefore a MEL was set at 0.02 mg/m3 (8-hour TWA) with a 10-min. ref. period MEL at 0.07 mg/m3.
ACGIH: TLV is based on the high reactivity, marked corrosive, irritating properties to mucous membranes and should prevent against possible sensitizing doses to the pulmonary tract.

Casnr: 563-80-4 Stofnaam: Methylisopropylketon
 Synoniemen: 3-Methyl-2-butanon

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	200	705			Ned:	Nee	
USA	1992:	200	705			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	200	705			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -92 °C

BOILING POINT: 93 °C

VAPOR PRESSURE: 10 mm Hg (at 8.3 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Four hours exposure at 5700 ppm was fatal to rats.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: "Pending acquisition of more information a TLV of 200 ppm, the same as for its isomers DEK and MPK, is suggested."

Casnr: 298-00-0 Stofnaam: Methylparathion
Synoniemen: Parathionmethyl

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,2			Ned:	Ja	
USA	1992:	-	0.2			USA:	Ja	
UK	1992:	-	0.2	-	0.6	UK:	Ja	UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,2			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 37 to 38 °C

VAPOR PRESSURE: 0.5 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Methyl parathion inhibits acetylcholinesterase.

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Intoxication causes cholinergic symptoms. LD50 for female and male rats is respectively 24 and 0-25 mg/kg.

SHORT TERM TOX: NEL in dogs (12 weeks feeding study) is 6 mg/day (omgerekend 6,4 mg/m3). 24 mg/day inhibited erythrocyte cholinesterase activity. 70 mg/day inhibited both plasma and erythrocyte cholinesterase activity, but did not produce illness.

LONG TERM TOX:

CARCINOGENICITY: Methyl parathion was not carcinogenic in rats and mice (lifetime study) at concentrations of respectively 40 and 125 ppm (= omgerekend resp. 9,2 en 47,5 mg/m3).

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rats, both sexes) = 67 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Intoxication causes cholinergic symptoms. Very few oral fatalities are known.

SHORT TERM TOX: Both the erythrocyte and plasma cholinesterase activity remained within 20% of control values, when men were given 7 to 9 mg/man/day for 30 days (omgerekend 0,7 tot 0,9 mg/m3).

One case of protracted intoxication after dermal and inhalatory exposure at methyl parathion is described.

LONG TERM TOX: Long term occupational exposures did not induce chromosomal aberrations.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is set in relation to parathion.

Casnr: 681-84-5 Stofnaam: Methylsilicaat
Synoniemen: Tetramethylorthosilicaat

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	6			Ned:		
USA	1992:	1	6			USA:		
UK	1992:	1	6	5	30	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	1C	6C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 12 °C
BOILING POINT: 121 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is a very severe eye irritant in rabbits, leading to edema and necrosis of the eyelid. Exposure at 1000 ppm and at 15,000 ppm (five minutes) caused "delayed" eye burn in rabbits. Exposure at 15,000 ppm for four minutes did not cause eye burn.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Four hours exposure at 250 ppm was lethal for rats. LC50 (guinea pigs) = 300, 95 and 26 ppm (exposures of 1, 4 and 8 hours respectively). "Lung function tests were normal if corneal damage was absent." NEL (guinea pigs; effect = eye damage) = 135 ppm (15 minutes); 90 ppm (one hour) and 20 ppm (eight periods of one hour each). Latent period for ophthalmic changes was up to three days; all corneal damage was reversible.
SHORT TERM TOX: NEL (effect being eye irritation) in guinea pigs = 20 ppm (8 periods of one hour each per day; 5 days).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): Industrial experience ranges from eye pain to eye loss. When exposure is moderate and adequate treatment (cortisone and penicillin) is immediately supplied, recovery is complete after one week. It is estimated that exposure at 200-300 ppm for 15 minutes can cause minimal corneal lesions; 1000 ppm produces injury requiring hospitalization.
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the "re-evaluation of the above".

Casnr: 98-83-9 Stofnaam: Methylstyreen (alpha-)
 Synoniemen: 2-Phenylpropeen; Isopropenylbenzeen

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	240			Ned:		
USA	1992:	50	242	100	483	USA:		
UK	1992:			100	480	UK:		UK:
BRD	1992:	100	480			BRD:		BRD:
Den	1992:	50	240			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -23 °C

BOILING POINT: 165.4 °C

VAPOR PRESSURE: 1.9 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Exposure of rats, guinea pigs, rabbits, mice and monkeys at 200 ppm (7 h/d; 5 d/w; six months) did not reveal any adverse effects (clinical or pathological).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure at 200 ppm caused eye irritation within two minutes and was unpleasant to smell.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the limited data presently available.

Casnr: 21087-64-9 Stofnaam: Metribuzine
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 125 to 126.5 °C

VAPOR PRESSURE: 0.00001 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: De stof wordt snel gedistribueerd.

BIOTRANSFORMATION: De stof wordt geoxideerd.

ELIMINATION: De stof wordt in onveranderde of geoxideerde vorm via de urine snel uitgescheiden.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): In konijnen werkt de stof niet irriterend op het oog of de huid.

SENSITIZATION: (SK/RESP): Bij cavia's werkte metribuzine niet sensitizerend.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Een 4 uurs expositie aan 860-892 mg/m3 van ratten en muizen veroorzaakte geen sterfte.

SHORT TERM TOX: Bij ratten die gedurende 3 weken; 6 u/d; 5 d/w blootgesteld werden aan 31 mg/m3 waren geen zichtbare effecten te vinden.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = rond de 2000 mg/kg. Katten en konijnen tolereren (?) doses tot 500 mg/kg. Eenmalige hoge doses (blootstellingsroute??) veroorzaakt depressie van het CZS.

SHORT TERM TOX: Herhaalde hoge doses (blootstellingsroute??) tast de stof de schilpklier en stimuleert het de "metabolizing" leverenzymen.

LONG TERM TOX: Een 2 jaren-studie met ratten met een dosering van 35; 100 en 300 ppm; en honden met 25; 100 en 1500 ppm, resulteerde in een NEL van 100 ppm (omgerekende Nel voor ratten en honden = resp. 24,5 en 35 mg/m3).

CARCINOGENICITY: In bovenstaande 2 jaren-studie zijn geen aanwijzingen voor carcinogeniteit van de stof gevonden. Ook niet in een vergelijkbare proef met muizen, die 20; 800 en 3200 ppm gevoerd kregen.

REPRODUCTION TOX: In proeven met konijnen (15; 45 en 135 mg/kg/dag) en ratten (15; 50 en 100 mg/kg/dag) had metribuzine geen teratogene of embryotoxische effecten. In een drie-generatietest met ratten (35; 100 en 300 ppm) werd geen invloed op de reproductie vastgesteld.

OTHER STUDIES:

3.4:DERMAL: LD50 (rat en konijn) = > 2000 mg/kg. Dagelijkse applicatie bij de rat van 1000 mg/kg (als 70% wettable powder) gedurende 3 weken veroorzaakte geen zichtbare effecten.

4:MUTAGENICITY: Er werd geen mutagen activiteit vastgesteld in de Ames test; RecAssay; E.coli; S. cerevisiae (in vitro), noch in de spermatogonia test bij de chinese hamster en de dominant letaal test bij muizen (in vivo).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Enkelvoudige en herhaalde plaktesten veroorzaakten geen irritatie.

SENSITIZATION (SK/RESP): Enkelvoudige en herhaalde plaktesten veroorzaakten geen huidsensitizatie.

ACUTE TOX: Er zijn geen gevallen van intoxicatie bekend

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Er zijn geen rapporten waarin effecten op de mens toegeschreven kunnen worden aan gemeten luchtconcentraties van metribuzine.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is gebaseerd op de bovenstaande gegevens. Ervan uitgaande dat er 100 % pulmonaire absorptie optreedt moet deze TLV nog een voldoende grote veiligheidsmarge hebben..

Casnr: 12001-26-2 Stofnaam: Mica
Synoniemen:

	tgg	Mg/m3	STEL	Huidno-	Carcino-	Sensibili-
	Ppm		Ppm	tatie	geen	serend
Ned 1994:	-	5		Ned:	Nee	
USA 1992:	-	3*		USA:		
UK 1992:	-	1*		UK:		UK:
BRD 1992:				BRD:		BRD:
Den 1992:				Den:		
Zwed 1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: Mica is a silicate occurring in plate form, containing less than 1% quartz. It includes nine different species, eg muscovite and phlogopite.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: When injected ip in guinea pigs it causes an inert reaction.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:

LONG TERM TOX: Eight of 57 workers exposed to dust associated with mica-scrap grinding, developed pneumoconiosis. They had been exposed to mica at 18 mineral particles per cubic foot (mppcf) for 18 years or more; or at 40 mppcf for 10 years or more; or at 50 ppm for 24 years or more. Five of six men exposed to more than 25 mppcf during more than 10 years, showed evidence of pneumoconiosis. No cases were found among workers exposed to mica dust in concentrations averaging 3 mppcf. Other workers, exposed to 20 mppcf for 18 years, showed mild pneumoconiosis (but also a very high incidence of silicosis).

EPIDEMIOLOGICAL STUDIES: Mica miners showed a higher incidence of pneumoconiosis and of tuberculosis than miners of other minerals. However in both groups quartz was present in the dust they were exposed to.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent disabling pneumoconiosis, but may not be sufficiently low to eliminate positive chest X-ray findings in workers with many years exposure.

Casnr: 64-18-6 Stofnaam: Mierezuur
Synoniemen: Formic acid; Myresyre

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
Ned	1994:	5	9			Ned:	
USA	1992:	5	9.4	10	19	USA:	
UK	1992:	5	9			UK:	UK:
BRD	1992:					BRD:	BRD:
Den	1992:	5	9			Den:	
Zwed	1990:	3	5	5	9	Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 8.4 °C
BOILING POINT: 100.8 °C
VAPOR PRESSURE: 34.5 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: There may be accumulation in the body (SCG).
BIOTRANSFORMATION: Formate is an intermediate product in normal metabolism.
Formic acid is partly metabolized into carbon dioxide (SCG).
ELIMINATION: Some of the formic acid is excreted unchanged in urine in rabbits and man. The carbon dioxide is exhaled (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Formic acid is irritating to the eyes, mucous membranes of nose and throat, and to the skin. Direct contact can cause severe burns (SCG, ACGIH).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Lung function of guinea pigs is affected at 0.3 ppm (SCG).
SHORT TERM TOX: Exposure to 20 ppm (6 h/d; 3 days to three weeks) caused disturbances of metabolic enzymes in liver, kidneys etc. and effects on glutathione and some proteinases in brain tissue in rats (RM TOX).
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX: Doses up to 20 mg per egg did not reveal any teratogenic effects in chicken eggs (SCG).
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Formic acid does not seem to affect DNA in vitro. A 8% solution showed little tumor promoting activity in a skin test (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Formic acid is irritating to the eyes, mucous membranes of nose and throat, and to the skin (SCG, ACGIH).
SENSITIZATION (SK/RESP):
ACUTE TOX: Depending on intake toxic signs include nausea, vomiting, hemorrhage, acidosis, hemolysis and damage to the heart and central nervous system (SCG). Nausea was reported after a mixed exposure to 15 ppm formic acid and 15 ppm acetic acid (ACGIH).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is irritation of eyes any passages.
ACGIH: TLV should prevent irritation of eyes and respiratory passages and possibly the skin.

Casnr: 7439-98-7 Stofnaam: Molybdeen, in water onoplosbaar
Synoniemen:

		tgg		STEL		Huidno- tatie Nee	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:	-	15	-	150	BRD:		BRD:
Den	1992:	-	10			Den:		
Zwed	1990:	-	10			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: varying °C

BOILING POINT: varying °C

2:TOXICOKINETICS: Mo is an essential trace element as a component for certain flavoprotein enzymes (SCG, ACGIH).

UPTAKE AND DISTRIBUTION: Mo-sulfide (up to 285 mg/m3) was not absorbed by inhalation in guinea pigs (SCG). If Mo is absorbed via the lungs, the blood level increases. Absorption after oral intake is 50% in man and 40 - 85% in laboratory animals. Mo accumulates rapidly in the kidney, liver and bones, with the highest concentrations found in the kidneys (SCG).

BIOTRANSFORMATION:

ELIMINATION: Mo is primarily excreted in the urine. After single oral administration in humans, Mo is eliminated in two phases; the first with a half time of a few hours, the second with a half time of about two weeks (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: 24 Hour exposure to 53 mg molybdc oxide/m3 was not fatal to animals; but 280 mg/m3 was (ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Mo intoxication results in diarrhea, loss of appetite, discoloration of hair, abnormalities of joints and even death, which are the same signs as with copper deficiency (SCG).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Dose-response or dose-effect relations can not be calculated. Sparingly soluble compounds are less toxic than easily soluble ones.

ACGIH: "Extrapolation of acute exposure to TLVs seems less conservative for Mo compounds than for many other substances."

Casnr: 7439-98-7 Stofnaam: Molybdeen, in water oplosbaar
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	5	-	50	BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:	-	5			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: varying °C

BOILING POINT: varying °C

2:TOXICOKINETICS: Mo is an essential trace element as a component for certain flavoprotein enzymes (SCG, ACGIH).

UPTAKE AND DISTRIBUTION: Mo is absorbed via the lungs and produces elevated blood - and urine levels of Mo. Absorption after oral intake is 50% in man and 40 - 85% in laboratory animals. Mo accumulates rapidly in the kidney, liver and bones, with the highest concentrations found in the kidneys (SCG).

BIOTRANSFORMATION:

ELIMINATION: Mo is primarily excreted in the urine. After single oral administration in humans, Mo is eliminated in two phases; the first with a half time of a few hours, the second with a half time of about two weeks (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Mo compounds (high concentrations) can cause transient irritation of the mucous membranes in mice (ACGIH, SCG).

SENSITIZATION (SK/RESP): MoCl5 was positive in guinea pigs; sodium molybdate was negative (SCG).

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure to 175 mg/m3 (sol. compounds) was injurious; LD75 (rat; one hour exp.) for MoO3 = 431 mg/m3 (ACGIH).

SHORT TERM TOX: 24 Hour exposure to 53 mg molybdc oxide/m3 was not fatal to animals; but 280 mg/m3 was (ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 for MoO3 and ammonium molybdate (rats) = respectively 125 and 333 mg/kg (ACGIH). Mo intoxication results in diarrhea, loss of appetite, discoloration of hair, abnormalities of joints and even death, which are the same signs as with copper deficiency (SCG).

SHORT TERM TOX: 120 Mg Mo/kg daily (in MoO3; Ca-Molybdate or NH4-Molybdate) killed rats and guinea pigs (ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip doses of 400 mg/kg of sol. compounds were highly lethal to guinea pigs (ACGIH) and induced lung adenomas in mice (unknown dose, dubious experiment??) (SCG).

3.4:DERMAL:

4:MUTAGENICITY: Ammonium molybdate is mutagenic for E. coli and growth inhibiting in a B. subtilis mutant (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: The more soluble compounds are the more toxic ones (SCG).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Exposure to 6 and 9.4 mg MoO3/m3 during four years induced respectively toxic effects, and aching joints and headaches in workers (ACGIH, SCG). Three of 19 workers, exposed to 1 - 19 mg Mo/m3 (MoO3 and metallic Mo) (4-7 years) showed pneumoconiosis (SCG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Dose-response or dose-effect relations can not be calculated. Sparingly soluble compounds are less toxic than easily soluble ones.

ACGIH: "Extrapolation of acute exposure to TLVs seems less conservative for Mo

compounds than for many other substances."

Casnr: 6923-22-4 Stofnaam: Monocrotophos
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,25			Ned:		
USA	1992:	-	0.25			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,25			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 54 to 55 °C; 25 to 30 °C (commercial).

BOILING POINT: 125 °C

VAPOR PRESSURE: 7,000,000 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Applicatie van de stof op de bovenarm van vrijwilligers, resulteerde in een percutane absorptie van 14 ± 7%. Indien luchtdicht afgeplakt, steeg de absorptie tot 33 ± 9%.

BIOTRANSFORMATION: Van een in de urine uitgescheiden hoeveelheid monocrotophos was het grootste gedeelte een hydrolyseproduct, terwijl 12-13% in onveranderde vorm uitgescheiden werd (zowel na orale als ip toediening).

ELIMINATION: Na intraveneuze toediening verscheen bij vrijwilligers 67 +/- 5% van gelabelde monocrotophos in de urine met een excretiepiek 4 tot 8 uur na toediening.

In ratten verscheen binnen 48 uur na blootstelling 62,8 - 71,3% van een oraal toegediende hoeveelheid gelabelde monocrotophos in de urine en 5% in de faeces. Bij geiten verschenen slechts sporen van de gelabelde stof in de melk na orale blootstelling.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Ratten die gedurende 1 uur blootgesteld werden aan een 75% concentratie van monocrotophos (luchtconc. onbekend) overleefden allen. Een 4 uur durende expositie aan 0,4 en 0,75% aerosol (luchtconc. niet bekend) resulteerde in de dood van resp. 2 van de 6; en 5 van de 8 ratten. Indien alleen het hoofd van de dieren blootgesteld werd aan de damp, stierf er 1 van de 8 ratten bij een expositie aan 0,4% damp gedurende 4 uur.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat en muis) = 5,7-17 mg/kg en 10-23 mg/kg in resp. een waterige en olieachtige formulering.

SHORT TERM TOX:

LONG TERM TOX: Bij ratten die gedurende 2 jaar 0; 1; 10 en 100 ppm gevoerd kregen, werden geen effecten gevonden in overleving en "general health". De dieren in de hoogst gedoseerde groep hadden een verminderde lichaamsgewicht toename maar bij sectie werden er geen afwijkingen geconstateerd. De plasma-, erythrocyten- en hersencholinesterase spiegel was gedaald bij de 10 en 100 ppm groepen (NEL = 1 ppm; omgerekend 0,35 mg/m3). Beagles werden gedurende 2 jaar 0; 0,16; 1,6 en 16 ppm monocrotophos gevoerd. Er was geen effect op mortaliteit, algemene gezondheid of gewichtstoename. Cholinesterase was in de 16 ppm groep aanzienlijk gedaald (NEL = 1,6 ppm; omgerekend 0,39 mg/m3).

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Een demyelinisatie studie bij kippen was negatief.

3.4:DERMAL: LD50 (konijn) = 112-709 mg/kg afhankelijk van het gebruikte oplosmiddel.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Veldwerkers, die mogelijk aan monocrotophos werden blootgesteld tijdens werkzaamheden, hadden 3 uur; 3 en 7 dagen na expositie geen daling in de cholinesterase-spiegel, hoewel op hun huid en kleren monocrotophos aangetoond kon

worden.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Er wordt uitgegaan van de verwachting dat de stof niet in het lichaam accumuleert. TLV is vastgesteld op basis van de hierboven beschreven gegevens en naar analogie met vergelijkbare stoffen.

Casnr: 60-34-4 Stofnaam: Monomethylhydrazine
Synoniemen: Methylhydrazine; MMH

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,2C	0,35C			Ned: Ja		
USA	1992:	0.01	0.019			USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,04	0,08			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
FREEZING POINT: -52.4 °C
BOILING POINT: 87.5 °C
VAPOR PRESSURE: 36 mm Hg (at 20 °C)

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 were calculated to be 74 ppm (rats); 56 ppm (mice) and 143 ppm (hamsters). Dogs exposed to 21 ppm died the following day; to 29 ppm they died during the four-hour exposure. All dogs survived a four-hour exposure to 15 ppm. It caused hemolysis, increased reticulocytosis, bilirubinemia and polymorphonuclear leukocytosis. Other investigators also noted nose and eye irritation, diarrhea, frequent urination, rapid respiration, convulsions and tremors in rats, mice and beagles. Exposure of dogs, monkeys, rats and mice to MMH resulted in a reversible dose-related hemolytic anemia, provided the levels had not exceeded 5 ppm.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY: MMH was carcinogenic in one study with mice; in two other studies it was not carcinogenic. There are also conflicting results in hamsters.
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: A ceiling of 0.2 ppm was recommended in 1978 (?). In 1991-1992 it is on the list of intended changes. No motivation is known for this.

Casnr: 86-88-4 Stofnaam: Naftylthioureum (α -)
 Synoniemen: ANTU

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	0,3			Ned:		
USA	1992:	-	0.3			USA:		
UK	1992:					UK:		UK:
BRD	1992:	-	0,3	-	1,5	BRD:		BRD:
Den	1992:	-	0,3			Den:	R40	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
 MELTING POINT: 198 °C
 BOILING POINT: decomposes

2:TOXICOKINETICS:
 UPTAKE AND DISTRIBUTION:
 BIOTRANSFORMATION:
 ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION: (SK/RESP):

3.2:INHALATION:
 ACUTE TOX (LOC/SYST):
 SHORT TERM TOX:
 LONG TERM TOX:
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.3:ORAL:
 ACUTE TOX: LD50 (rats, dogs) = 30-50 mg/kg; for rabbits LD50 = 1000 mg/kg; for monkeys LD50 = 4250 mg/kg. One of the acute effects is pulmonary effusion. After repeated exposures, tolerance to this effect can develop.
 SHORT TERM TOX: Repeated exposure leads to hypothyroidism, caused by the cumulative action of ANTU on the thyroid and adrenals.
 LONG TERM TOX: A dietary level of 50 ppm (during two years) produced tissue damage in rats (Effect Level = omgerekend 11,5 mg/m3).
 CARCINOGENICITY:
 REPRODUCTION TOX:
 OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
 IRRITATION (SK/MM/EY/RESP):
 SENSITIZATION (SK/RESP): One case of contact eczema is reported after handling a rat poison containing ANTU as a base.
 ACUTE TOX:
 SHORT TERM TOX:
 LONG TERM TOX:
 EPIDEMIOLOGICAL STUDIES: ANTU is usually(?) contaminated with β -naphtylamine, which can cause bladder tumors.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: At the proposed TLV, "it is believed that the amount of β -naphtylamine exposure would pose no carcinogenic risk provided skin contact is avoided". Also other adverse effects of ANTU are believed to be protected against by this TLV.

Casnr: 7631-90-5 Stofnaam: Natriumbisulfiet
Synoniemen: Natriumhydrogensulfiet (Deens)

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: It decomposes when heated.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is irritating to the eyes, skin and mucous membranes.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = about 2 g/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip LD50 (rat) = 115 mg/kg.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): "Medical reports of acute exposures have shown mild eye and respiratory responses."

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: "Inhalation of or contact with the dust would result in high local concentrations in contact with small areas of sensitive tissue. A TLV well below that for nuisance dusts seems definitely in order."

Casnr: 62-74-8
Synoniemen:

Stofnaam: Natriumfluoracetaat

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,05			Ned: Ja		
USA	1992:	-	0.05	-	0.15	USA: Ja		
UK	1992:	-	0.05	-	0.15	UK: Ja		UK:
BRD	1992:	-	0,05	-	0,1	BRD: Ja		BRD:
Den	1992:	-	0,05			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: it is a powder.

MELTING POINT: 200 °C

BOILING POINT: 20 °C (?) (decomposes)

VAPOR PRESSURE: approx. 0 mm Hg.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 1,7 mg/kg.

SHORT TERM TOX:

LONG TERM TOX: Ratten die gedurende 2 jaar 5 ppm (= omgerekend 1,75 mg/m3) natriumfluoracetaat gevoerd kregen vertoonden weefselveranderingen. Lagere doseringen werden niet getest.

Een andere onderzoeker constateerde dat een toevoeging van 10 ppm aan het dieet van ratten, als enige effect een tijdelijke fluctuatie in de groeisnelheid teweeg bracht. Bij 20 ppm (= 2 mg/kg bij jonge ratten; dit is omgerekend 14 mg/m3) werd de groeisnelheid in de eerste week sterk verminderd, maar sterfte kwam niet voor en de groeisnelheid werd in de loop van drie of vier weken weer normaal. De ontstane tolerantie voor wat betreft dit effect (afname groeisnelheid) was kort (minder dan 2 weken) na beeindiging van de proefperiode verdwenen. Eenmaal gewende ratten die de stof doorgevoerd kregen verdroegen zelfs orale hoeveelheden die hoger waren dan de LD50.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: "TLV is laag genoeg om systemische toxiciteit te voorkomen".

Casnr: 1310-73-2 Stofnaam: Natriumhydroxide
Synoniemen:

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							serend
Ned	1994:	-	2C			Ned:	
USA	1992:	-	2C			USA:	
UK	1992:	-	-	2		UK:	UK:
BRD	1992:	-	2	4C		BRD:	BRD:
Den	1992:	-	2C			Den:	
Zwed	1990:	-	2C			Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 318.4 °C
BOILING POINT: 1390 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX: Rats, exposed at NaOH 30 min. per day (unknown concentration) showed pulmonary damage after two to three months.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP): Patty believes that 2 mg/m3 is noticeable, but not excessively irritant. In combined exposure at concentrations NaOH between 0.005 and 0.7 mg/m3, and concentrations other solvents (including Stoddard solvent) as high as 780 mg/m3, burning/redness of the eyes, throat or nose was reported. Brief exposures at 0.24; 1.86 and 0.8sed irritation of the throat or watering eyes, whereas exposure at 0.28 mg/m3 was not irritating.
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: NIOSH recommends a ceiling of 2 mg/m3. "The above data suggest that it is not unduly restrictive."

Casnr: 7681-57-4 Stofnaam: Natriummetabisulfiet
Synoniemen: Disodiumdisulphite, Natriumpyrosulfiet

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5			UK:		UK:
BRD	1992:	-				BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
DECOMPOSES: >150 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX: Een 2-jarige proef met ratten veroorzaakte op een dieetniveau van 0,215% geen negatieve effecten (omgerekend = 756 mg/m3). Geextrapoleerd naar de mens met een veiligheidsfactor van 10 komt dit niveau overeen met een luchtconcentratie van 70 mg/m3.
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: LD50 iv (konijn) = 192 mg/kg; (rat) = 115 mg/kg.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is vastgesteld op een waarde die lager ligt dan die voor hinderlijk stof, aangezien de stof enige irritatie van de slijmvliezen zou kunnen veroorzaken.

Casnr: 54-11-5 Stofnaam: Nicotine
Synoniemen:

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,07	0,5			Ned: Ja		
USA 1992:	-	0.5			USA: Ja		
UK 1992:	-	0.5	-	1.5	UK: Ja		UK:
BRD 1992:	0,07	0,5	0,14	1,0	BRD: Ja		BRD:
Den 1992:	-	0,5			Den: Ja		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 247 °C with decomposition at 745 mm Hg.
VAPOR PRESSURE: 0.0425 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): The threshold concentration for poisoning is considered to be 0.2 mg nicotine sulfate mist/m3 (with animals?).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 53 mg/kg; (mice) = 3.3 mg/kg.

SHORT TERM TOX: A diet containing 60 ppm (= omgerekend 21 mg/m3) inhibited growth of rats.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Poisoning by nicotine has been recorded many times, mostly due to ingestion or skin absorption. Fatal occupational poisoning has been "relatively uncommon" (in 1937!). Milder cases with vomiting and diarrhea, have occurred among chemical processors and insecticide applicators. Fatal dose is estimated at 60 mg. A toxic effect can result from 2-5 mg, showing nausea.

SHORT TERM TOX:

LONG TERM TOX: Nicotine is considered to be responsible for the acute physiologic effects of smoking, chewing or inhaling tobacco, but not the chronic, such as lungcancer, emphysema and heart disease.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: With the present TLV, an 8-hour intake of nicotine by inhalation is 5 mg, which should not result in significant ill effects.

Casnr: 100-01-6 Stofnaam: Nitroaniline (p-)
Synoniemen: 4-Nitroaniline, PNA

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	6			Ned: Ja		
USA	1992:	-	3			USA: Ja		
UK	1992:	-	6			UK: Ja		UK:
BRD	1992:	1	6			BRD: Ja		BRD:
Den	1992:	0,5	3			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 148 °C

BOILING POINT: 332 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: PNA is a powerful methemoglobin former with ultimate hemolytic effect.

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Several cases of acute occupational intoxication with PNA are reported. Symptoms were cyanose and complaints of headache, sleepiness, weakness and respiratory distress. One man who already had a liver disease, became jaundiced and died. Children eating wax crayons, containing PNA got sick.

SHORT TERM TOX: Prolonged exposure may result in liver damage.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV of 1 ppm was recommended on the basis that PNA is more toxic than aniline (TLV = 5ppm) and should have a lower TLV. In 1982 TLV was reduced from 6 to 3 mg/m3 without motivation.

Casnr: 98-95-3 Stofnaam: Nitrobenzeen
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 1	5				Ned: Ja		
USA	1992: 1	5				USA: Ja		
UK	1992: 1	5	2	10		UK: Ja		UK:
BRD	1992: 1	5	2	10		BRD: Ja		BRD:
Den	1992: 1	5				Den: Ja		
Zwed	1990: 1	5	2	10		Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 6 °C
BOILING POINT: 210.85 °C
VAPOR PRESSURE: < 1 mm Hg

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: A worker who is exposed at 1 ppm all day, is estimated to absorb 25 mg nitrobenzene per day. One third would be absorbed by the skin, the rest by inhalation. In one study, the authors considered 35 mg/day to be the maximal allowable concentration.

BIOTRANSFORMATION: Nitrobenzene is biotransformed into p-nitrophenol.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Rats and mice were exposed at 0; 5; 16 or 50 ppm (6 h/d; 5 d/w; 90 days). At all levels tested a dose-related methemoglobinemia occurred with secondary splenic changes.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Exposure at 50 ppm (6 h/d; 5 d/w; 90 days) caused degeneration of the seminiferous epithelium in rats, but not in mice.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Primary effect of poisoning is conversion of hemoglobin into methemoglobin. Exposure at 200 ppm for one hour did not cause serious disturbances; 1 to 5 ppm is considered a safe level for daily exposure.

SHORT TERM TOX: In sub-acute and chronic poisonings, anemia is the leading clinical symptom. Also symptoms as vertigo, headache and vomiting have been noted. In a plant, concentrations of almost 40 ppm resulted in intoxications, whereas 6 ppm (average) caused only one or two cases of vertigo and headache. At this latter exposure level, examination of the blood revealed small amounts of methemoglobin and sulfhemoglobin and some Heinz bodies.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the cyanogenic and anemiagenic potentials of the compound.

Casnr: 100-00-5 Stofnaam: Nitrochlorbenzeen (p-)
 Synoniemen: 1-Chloor-4-nitrobenzeen; PNCB; PCNB

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned: Ja		
USA	1992:	0.1	0.64			USA: Ja		
UK	1992:	-	1	-	2	UK: Ja		UK:
BRD	1992:	-	-	-	-	BRD: Ja	IIIB	BRD:
Den	1992:	-	1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 85.5 °C

BOILING POINT: 242 °C

VAPOR PRESSURE: 0.15 mm Hg (at 30 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: In man, PNCB can be absorbed through the skin and the lungs (DFG, ACGIH).

BIOTRANSFORMATION: The compound is biotransformed by hydroxylation of the ring or reduction of the nitro-group (DFG). Major urinary metabolites in rats are conjugated (glucuronide or sulfate) forms of nitro-chlorophenol and N-acetylcysteine conjugate of nitrobenzene (ACGIH). Minor metabolites include aminochlorophenol and N-acetylated aminochlorophenol. In rabbits, also parachloroaniline has been identified as a urine metabolite (ACGIH, DFG).

ELIMINATION: In rats, 95.5% of a single oral dose of approximately 200 mg/kg was excreted within 72 hours via the urine (ACGIH) and in rabbits, the excretion was finished within 48 hours. Seven hours after intra gastral administration of the compound, it could no longer be detected in the blood (DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound was not (or very slightly) irritating to the eyes or skin of rabbits (DFG, ACGIH).

SENSITIZATION: (SK/RESP): After dermal application PNCB was sensitizing in guinea pigs (ACGIH, DFG) and also in a inhalatory sensitizing test with rats, but not in a Draize-sensitizing test with rabbits (DFG).

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Lethal concentration for rats in a four-hour, head-only exposure was 16,000 mg/m3 (ACGIH); at 2400 mg/m3 the rats showed a slight cloudy cornea; at 2610 mg/m3 the animals were lethargic (DFG).

SHORT TERM TOX: Rats, who were exposed head-only at 50; 290 or 640 mg/m3 (6 h/d; 5 d/w; 2 weeks) showed methemoglobinemia and increased spleen weight at all levels. At the two highest levels, animals showed decreased testes weight with degeneration of the seminiferous tubules and abnormal spermatid contents of epididymides, as well as microscopic changes in the spleen, bone marrow and kidney. The highest level group showed a slight increase in liver weight. According to DFG NOEL was 8 mg/m3. Rats were exposed (whole body) at 0; 5; 15 or 450 mg/m3 (6 h/d; 5 d/w; 4 weeks). A dose related increase in blood methemoglobin levels was found in all dose groups, together with microscopic changes in the spleen. No NEL could be set (ACGIH, DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: see above for toxic testes effects.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats, mice) = respectively 420 - 830 and 650 - 1410 mg/kg (DFG, ACGIH).

SHORT TERM TOX: Male and female rats were fed 0; 3; 10 or 30 mg/kg/day for 90 days. In all dose groups increased methemoglobin levels, decreased hemoglobin, hematocrit, red blood cell count and urinary urobilinogen values, and gross and microscopic changes in the spleen were observed. Hemosiderosis in liver and kidney, and occasionally extramedullary hematopoiesis in the liver was seen in the two highest dose groups. The highest dose group, showed hyperplasia of bone marrow and testicular atrophy. (omgerekende blootstellingen: 0; 13,8; 46 of 138 mg/m3) (ACGIH). In a 6 months feeding test with rats, NEL was 0.0025 mg/kg (= omgerekend 0.01 mg/m3) (DFG).

LONG TERM TOX: In a two year study (stomach tube administration), NEL in female and male rats was 0.1 mg/kg/day (omgerekend = 0,46 mg/m3). Critical effect was elevated methemoglobin levels (ACGIH, DFG).

CARCINOGENICITY: No treatment-related increase in tumors were found in rats given daily up to 5.0 mg/kg by stomach tube during two years. In another two year feeding test, mice showed an increase in vascular tumors at both feeding levels of 3000 and 6000 mg/kg food. Male mice showed an increase in liver tumors at the lowest feeding level. No tumors were seen in male rats (ACGIH, DFG).

According to DFG this last study did not meet with the recent standards of scientific research.

REPRODUCTION TOX: PNCB produced teratogenic effects (embryotoxicity and fetal skeletal malformations) in rats only at dosages (15 and 45 mg/kg; on days 6 through 19 of gestation) which produced significant maternal toxicity. In rabbits, NEL (both maternal and teratogenic or fetotoxic) was 15 mg/kg daily on days 7 through 19 of gestation (ACGIH, DFG). In a reproduction study in two generations rats, NEL was 0.1 mg/kg/day (= omgerekend 0.46 mg/m³) (ACGIH), but according to DFG, NEL = 0.7 mg/kg (= omgerekend 3.2 mg/m³), which dosage caused a slightly reduced mating index (ACGIH). Single oral dose of 250 mg/kg did not reveal any toxic effects in testes of rats (DFG).

OTHER STUDIES:

3.4:DERMAL: LD 50 (rabbits) = > 3040 mg/kg. After absorption through the skin of rabbits, it produced methemoglobinemia with Heinz bodies, anemia, hematuria and hemoglobinuria.

4:MUTAGENICITY: PNCB was mutagenic in a mouse lymphoma cell/point mutation assay with and without metabolic activation. In Ames tests with and without S9-mix, some were positive, others negative. Other tests (E. coli; dominant lethal test; CHO cell/point mutation assay; DNA repair assay with rat hepatocytes and in vivo rat bone marrow cell clastogenesis assay) showed no mutagenic activity. PNCB can cause DNA damage in cultured hepatocytes after 3 hour treatment and also in liver, kidney and brain cells of rats after a single ip dosage of 30 to 1000 mg/kg (ACGIH, DFG). PNCB caused SCE and chromosomal aberrations in CHO cells after metabolic activation (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Several cases of cyanosis, weakness and headaches were reported after a short, or two to four days exposure at PNCB (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Exposure to concentrations below 0.4 mg/m³ (8 h/d; 5 d/w) did not reveal any toxic signs, although the urine concentrations of metabolites increased during a weeks work. Workers exposed to mean concentrations varying from 8.6; 19.6 to 22.3 mg/m³ showed headaches and vertigo from time to time. Uptake by skin contact was expected (DFG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: PNCB proved to be in general genotoxic in bacterial assays. In animal studies, the compound induced the same type of tumors as other monocyclic amines. Recent studies, until now not yet published, reveal an unequivocal carcinogenicity of PNCB in mice and rats. Until these results are published, the compound will be classified in the IIIB group.

ACGIH: Methemoglobin formation is the critical effect. NEL in rats, extrapolated from "the repeated dose study" was 0.9 mg/m³. In combination with the human data, a reduction from 3 to 0.6 mg/m³ with a skin notation is recommended.

Casnr: 79-24-3 Stofnaam: Nitroethaan
Synoniemen:

	tg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	100	310	Ned:	Nee	
USA 1992:	100	307	USA:		
UK 1992:	100	310	UK:		UK:
BRD 1992:	100	310	BRD:		BRD:
Den 1992:	100	310	Den:		
Zwed 1990:			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -50 °C
BOILING POINT: 114 °C
VAPOR PRESSURE: 15.6 mm Hg (at 20 °C)
ODOR THRESHOLD: 6.5 mg/m3

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Rats absorbed about 60% by inhalation, when exposed to 1000 ppm. Rabbits had amounts of nitrate in their blood proportional to duration and concentration of exposure (SCG). There is no significant skin absorption (ACGIH).

BIOTRANSFORMATION:

ELIMINATION: Excretion is fast; 14% in exhaled air within three hours after intracardial injection to rats; after 30 hours there was practically no nitroethane left (SCG, ACGIH).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 500 ppm caused severe eye irritation. It is a weak skin irritant (ACGIH).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): 5000 ppm for 3 hours was lethal to rabbits (SCG). It produces respiratory tract irritation and narcosis. Animals that died showed liver damage (ACGIH).

SHORT TERM TOX: Exposure to 350 and 1000 ppm (6 h/d; 5 d/w; 13 weeks) caused degenerative and inflammatory changes in the olfactory epithelium of mice and rats, as well as elevated methemoglobin levels and vacuolisation in liver cells of the highest dose group. At 100 ppm only minimal elevation of methemoglobin was found (= MAEL) (SCG).

LONG TERM TOX: Rats, exposed to 200 ppm (7 h/d; 5 d/w; two years) showed no difference in serum protein activity (SCG).

CARCINOGENICITY: In the above mentioned long term study, no increase in tumor incidence was found (SCG).

REPRODUCTION TOX: Mice exposed to 1000 ppm (6 h/d; 5 d/w; 13 weeks) showed chromosome damage (SCG).

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Nitroethane is reported to be mutagenic; Ames tests with various strains were negative (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "Critical effects are its effects on the olfactory epithelium, liver and methemoglobin formation."

ACGIH: TLV should be used with discretion in view of the liver toxicity and to the fact "that the related chemical 2-nitropropane is a suspect carcinogen".

Casnr: 55-63-0 Stofnaam: Nitroglycerine
Synoniemen: Glyceroltrinitraat

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,05	0,5			Ned: Ja		
USA	1992:	0.05	0.46			USA: Ja		
UK	1992:	0.2	2	0.2	2	UK: Ja		UK:
BRD	1992:	0,05	0,5	0,1	1,0	BRD: Ja		BRD:
Den	1992:	0,02C	0,2C			Den: Ja		
Zwed	1990:	0,03	0,3	0,1	0,9	Zwed: Ja		Zwed:

NIOSH REL (1992) = 0.1 mg/m3 STEL skin notation.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 13.1 °C

"Appreciable volatile" at 100 °C (Merck) ("explosion point": 256 °C)

VAPOR PRESSURE: 0.00026 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorbed via skin and lungs. Total uptake is primarily determined by skin uptake (SCG).

BIOTRANSFORMATION: NG is biotransformed primarily in the liver into carbon dioxide and nitrate and nitrite (SCG).

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY: Carcinogenicity studies with NG with rats and mice were negative, except for a higher incidence of adenomas of the pituitary gland in female mice.

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: Primarily workers in dynamite factories are exposed to EGDN, but always in combination with Nitroglycerin (NG).

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Several cases of "sudden death" in dynamite workers are reported (SCG) (with average concentrations of 0.18 to 0.24 ppm NG). Additional exposure by skin absorption was not ruled out (ACGIH). EGDN and NG affects the circulatory system; symptoms include headache, heart palpitations, increased heart rate, dizziness and nausea. Headaches can appear at air concentrations of 0.1 mg/m3. Workers who are not particularly sensitive to the vessel dilating effect of EGDN and NG can develop some degree of adaptation, which rapidly disappears during periods away from work (SCG). SHORT TERM TOX: Intermittent exposures between 0.03 and 0.11 ppm in plants where only NG was handled resulted in complaints of headache and irritation. NEL was 0.01 ppm (ACGIH).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Several studies show that workers with long-term exposure to EGDN and NG had a significant excess mortality from heart- or cerebrovascular disease (SCG, ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Total uptake is primarily determined by skin uptake, which makes it impossible to state a relationship between long-term effects and air concentrations.

ACGIH: TLV is raised from 0.02 to 0.05 ppm in 1981, in analogy with

propylene glycol dinitrate and considering the "development of tolerance to headaches resulting from repeated 8-hour exposures to 0.2 ppm".

Casnr: 108-03-2 Stofnaam: Nitropropaan (1-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	25	90			Ned:		
USA	1992:	25	91			USA:		
UK	1992:	25	90			UK:		UK:
BRD	1992:	25	90			BRD:		BRD:
Den	1992:	15	54			Den:		
Zwed	1990:	5	18	10C	35C	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -108 °C

BOILING POINT: 132 °C

VAPOR PRESSURE: 7.5 mm Hg (at 20 °C)

ODOR THRESHOLD: 5 - 11 ppm

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: Through a denitrification process, the formation of nitrite results. After high exposures, some methemoglobin is formed (SCG).

ELIMINATION:

3:ANIMAL EXPERIMENTS: 1-NP appeared to be the most toxic of the nitroethane, nitromethane and nitropropane series, with regard to liver injury (ACGIH).

3.1:IRRITATION (SK/MM/EY/RESP): Exposure of guinea pigs and rabbits to 500 or 1000 ppm resulted in irritation of the respiratory tract and agitation. A few (?) animals died (SCG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Exposure of rats to 100 ppm (7 h/d; 5 d/w; more than 20 weeks) was without effects (SCG, ACGIH).

LONG TERM TOX:

CARCINOGENICITY: Exposure of rats to 100 ppm (7 h/d; 5 d/w; more than 20 weeks) induced no liver carcinomas (SCG, ACGIH).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD0 in rabbits (stomach tube) = 0.25 - 0.5 g/kg (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: The compound was respectively negative and relatively inactive in two Ames tests (SCG, ACGIH).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to concentrations over 100 ppm (15 min) was irritating the eyes (SCG, ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is irritation of the eyes and mucous membranes.

ACGIH: "TLV is considered to prevent an increased health risk for workers."

"Although there is no evidence that 1-NP is carcinogenic, its other toxic properties are similar to those of its isomer, which has been so labeled."

Casnr: 99-08-1 Stofnaam: Nitrotolueen (m-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 2		11			Ned: Ja		
USA	1992: 2		11			USA: Ja		
UK	1992: 5		30	10	60	UK: Ja		UK:
BRD	1992: 5		30	10	60	BRD: Ja		BRD:
Den	1992: 2		12			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

Nitrotoluene has three isomers; o-, m- and p-nitrotoluene. This document only considers m-nitrotoluene.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 16 °C

BOILING POINT: 232.6 °C

VAPOR PRESSURE: 0.15 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake occurs via inhalation, via mucous membranes and the skin (SCG).

BIOTRANSFORMATION:

ELIMINATION: Within 12 hours after single oral administration of 200 mg/kg of the compound, male and female rats excreted respectively 10.8 and 4.3% in the bile. In rats 70 to 85% of oral administered nitrotoluene is excreted in the urine. Major biotransformation product is meta-nitrobenzoic acid, which is further transformed into the glucuronide (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): It was not irritating to the skin and eyes of rabbits (SCG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Exposure to m-nitrotoluene resulted in testicular damage (SCG).

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Feeding 200 mg/kg/day (5 d/w; 6 months) resulted in hair loss in female rats (SCG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: M-nitrotoluene was negative in Ames tests, in chromosome aberration tests in CHO cells in vitro; it did not induce DNA repair in rat hepatocytes in vivo. SCE in CHO cells was positive (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Cases of poisoning from nitrotoluene are uncommon (ACGIH). It is capable of forming methemoglobin, its potential however is considered to be relatively low (SCG, ACGIH).

SHORT TERM TOX: Chronic exposure can cause anemia, but to a lesser degree than other aromatic nitro compounds (SCG).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "A scientific base for a OEL does not exist."

ACGIH: TLV is set in analogy with aniline.

Casnr: 111-84-2 Stofnaam: Nonaan (n-)
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	200	1050			Ned:	Nee	
USA	1992:	200	1050			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	200	1050			Den:		
Zwed	1990:	150	800	200	1100	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -51 °C

BOILING POINT: 150.7 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rats) = 3200 ppm, with a 4-hour exposition.

SHORT TERM TOX: A 65-day, (6h/d; 5d/w) NAEL of 590 ppm for nonane was found for rats.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Since nonane is considered to be less toxic than octane, a lower TLV is fixed.

Casnr: 111-65-9 Stofnaam: Octaan (n-)
Synoniemen:

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 300	1450			Ned:		
USA	1992: 300	1400	375	1750	USA:		
UK	1992: 300	1450	375	1800	UK:		UK:
BRD	1992: 500	2350	1000	4700	BRD:		BRD:
Den	1992: 300	1450			Den:		
Zwed	1990: 200	900	300	1400	Zwed:		Zwed:

NIOSH has published a document on alkanes (C5-C8) in 1977. Their 1992 recommendation REL for octane is 75 ppm (350 mg/m3) TWA, with a Ceiling of 385 ppm (1800 mg/m3). Health effects are skin and nervous system effects.

1:PHYSIOCHEMICAL PROPERTIES:

Octane has 17 isomer (ACGIH). The straight chain alkanes are more toxic than their branched isomers (NIOSH).

MELTING POINT: -56.8 °C

BOILING POINT: 125.7 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION: The alkane concentration required to produce a physiologic effect decreased with increasing number of carbon atoms in the compound (NIOSH). ACUTE TOX (LOC/SYST): Exposure to 6,634 ppm for one hour resulted in mice lying down; 8,560 ppm induced narcosis and 5,350 ppm (for) 48 min. did not induce narcosis in mice. Exposure to 16,000 to 32,000 ppm for 5 minutes caused respiratory arrest in mice (NIOSH, ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Dermal application of undiluted octane for one hour produced a burning sensation with reduced pain 180 min. after removal; five hours application caused blister formation, but no anesthesia (NIOSH).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

NIOSH: Although polyneuropathy has not yet been attributed to exposure to pentane, heptane of octane, evidence exists which suggests that these alkanes are similar in toxicity to hexane. In 1976 a REL of 350 mg/m3 TWA for hexane was considered offering a sufficient margin of safety to protect against the development of chronic nerve disorders in workers. This limit is also recommended for octane.

ACGIH: They believe the theory that the neurotoxicity of hexane is due to its metabolites, which are the same as those of methyl n-butylketone. TLV is based by analogy with, and on comparison of acute toxicity of other paraffinic hydrocarbons.

Casnr: 2234-13-1 Stofnaam: Octachloornaftaleen
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	0,1			Ned:	Ja	
USA	1992:	-	0.1	-	0.3	USA:	Ja	
UK	1992:	-	0.1	-	0.3	UK:	Ja	UK:
BRD	1992:	-	0,1			BRD:	Nee	BRD:
Den	1992:					Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 192 °C

BOILING POINT: 440 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Chloronaphtalenes in general may produce acnelike lesions, which may itch severely. The more highly chlorinated compounds are the worst offenders. Repeated exposures to fumes of molten chlorinated naphtalenes can lead to severe and sometimes fatal systemic poisoning. The major effect is severe injury to the liver, characterized as acute yellow atrophy.

"No specific data on octachloronaphthalene are available".

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Experiments on cattle are done with octa- and hexachloronaphtalene. The results are divergent. A possible cause may be the poorer absorption in the case of insoluble compounds.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent serious liver injury and minimize skin effects.

Casnr: x Stofnaam: Olienevel
Synoniemen: Minerale olie

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5	-	10	USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	2			Den:		
Zwed	1990:	-	1*	-	3*	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: Droplets size may vary depending on the nature of operation. Composition of oil mist is extremely heterogeneous (SCG). TLV documentation only considers mineral oil.
BOILING POINT: 360 °C (mineral oil)

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Heat decomposed oil fumes are irritant to the lungs (ACGIH).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Monkeys, but not mice, rats, guinea pigs or rabbits, showed a higher incidence of infectious pneumonia and hyperplastic gastritis (probably due to swallowed oil) when exposed to highly concentrated aerosols of automobile or diesel motor oil (SCG).

SHORT TERM TOX:

LONG TERM TOX: Rats and dogs, exposed to 100 mg/m3 of a mineral oil aerosol during one year, showed accumulation of oil and granulomas in the lymph nodes. 5 mg/m3 was a NEL (SCG). Exposure to 100 mg/m3 (one year) unused paraffin oil with added acetone caused microgranulomas in the lungs of rats and dogs, but not in mice. The rats were still not fully recovered 10 months after ending of the exposure (SCG). 5 mg/m3 was a NEL (SCG, ACGIH). A NEL in a 18 months study with sulfurized, solvent extracted naphtenic-base oil = 50 mg/m3 (animal species??) (ACGIH).

CARCINOGENICITY: After two years exposure to 5 mg/m3 of a cooling oil aerosol, one rat had epithelial cancer and another liver cancer. In the same way exposed guinea pigs did not develop tumors (SCG). Neither did a lung-tumor susceptible strain of mice (ACGIH).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: Development of tumors depend on the chemical composition of a peroleum-based oil (SCG).

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Oil mist can irritate the mucous membranes of nose and throat and eyes.

SENSITIZATION (SK/RESP): Allergic contact eczema is often caused by the bactericidal additives or metal contaminants of the oil.

ACUTE TOX: An oil aerosol of 5 mg/3 causes some discomfort; concentrations below 2.5 mg/m3 do not.

SHORT TERM TOX: Exposure to oil can cause contact eczema, oil acne and skin cancer (localized on the backs of the hands, armpits and scrotum, resulting from direct contact).

LONG TERM TOX: Exposure levels below 3 mg/m3 will protect against lipoid pneumonia, which can develop at higher occupational exposures.

EPIDEMIOLOGICAL STUDIES: Workers (non-smokers) exosed to oil mist during (more than) 16 years (concentrations 2 - 3 mg/m3; but 12 years before 5 mg/m3 or higher), reported more respiratory complaints (coughing) than controls. X-rays of the lungs, and blood and urine analysis did not show any differences. In one

epidemiological study, oil mist exposed workers showed no higher mortality or respiratory diseases than not-exposed in respectively fifteen and five years, with concentrations of 5 - 21 mg/m³. In another study (no concentrations) there was a higher incidence of nasal cancer in workers, exposed to cutting oil. No symptoms of lipoid pneumonia, lung cancer or gastritis were found in 19 workers, exposed to 2.8 mg/m³ for 9 - 18 years, but lung X-rays of twelve men showed linear striations. No clinical symptoms, but a higher incidence of respiratory complaints were found in 217 men exposed to 2 - 2.5 mg/m³ for an average of 13 years. Metal cutters exposed to oil mist for at least five years (concentrations estimated about 5 mg/m³ and (later) measured 1 - 7.3 mg/m³), had a higher incidence of scrotal cancer and stomach cancer. Six lathe workers, exposed (for minimal four years) to levels below "applicable exposure limits" (of 5 mg/m³???) and, later, measured levels of 1.3 to 2.5 mg/m³ oil mist, showed a 100% incidence of cilia rejection, hyperplasia and/or metaplasia of the nasal mucous membranes, whereas controls had no pathologically changed mucous membranes. The reported changes may be the early stages of cancer. The oil contained less than 6% aromatic hydrocarbons and minimal amounts of additives.

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Long-term exposures to concentrations of about 2 mg/m³ can cause adverse effects.

ACGIH: TLV only apply at the liquid phase. In most cases, the amounts of vapor, containing volatile hydrocarbons, are too low to contribute significantly to the problem of causing toxic effects. This indicates the TLV provides a considerable safety margin for the types of cutting and lubricating oils most frequently encountered, where there has been no substantial altering of composition by heat and/or oxidation.

Casnr: 20816-12-0 Stofnaam: Osmiumtetraoxide
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,0002	0,002			Ned:		
USA	1992:	0.0002	0.002	0.0006	0.005	USA:		
UK	1992:	0.0002	0.002	0.0006	0.006	UK:		UK:
BRD	1992:	0,0002	0,002	0,0004	0,004	BRD:		BRD:
Den	1992:	0,0002	0,002			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 39.5 to 41 °C

BOILING POINT: 130 °C

VAPOR PRESSURE: 11 mm Hg (at 27 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Rabbits, exposed at 130 mg/m3 or more (estimated conc.) for 30 min. succumbed after 4 days from pulmonary edema.

LC50 (rats, mice) = 40 ppm, 4-hour exposition.

SHORT TERM TOX: (?) Toxic effects on the bone marrow in guinea pigs have been reported.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Workers, have noted eye symptoms (ground glass and halo effects) and irritation of the respiratory passages. Irritation of the nose and throat may persist at least twelve hours after cessation of exposure.

SENSITIZATION (SK/RESP):

ACUTE TOX: "An experimenter, after a brief exposure at a much lower concentration" (lower than 130 mg/m3), experienced delayed lacrimation and "halo" effects.

Max. 0.001 mg/m3 can be tolerated for six hours without harmful effects.

Workers, exposed to 0.1-0.6 mg/m3, experienced lacrimation and disturbances of vision, and in some cases, headache, conjunctivitis and cough. Exposure was not continuous and symptoms sometimes developed after two hours.

In 1874 there has been a human fatality from inhalation of osmiumtetroxide.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based in part on the notation of the highest concentration tolerated in six hours exposition (0.001 mg/m3).

Casnr: 144-62-7 Stofnaam: Oxaalzuur
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1	-	2	Ned:		
USA	1992:	-	1	-	2	USA:		
UK	1992:	-	1	-	2	UK:		UK:
BRD	1992:	-	1	-	2	BRD:		BRD:
Den	1992:	-	1	-	2	Den:		
Zwed	1990:	-	1	-	2	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 189.5 °C (anhydrous); 101.5 °C (dihydrate)

SUBLIMES: 157 °C

VAPOR PRESSURE: < 0.001 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: It can be absorbed by the skin, lungs and digestive tract (SCG).

BIOTRANSFORMATION: It occurs naturally in the body (SCG).

ELIMINATION: Oxalic acid is excreted mainly unchanged; after iv administration, volunteers excreted 88 to 99% in urine within 36 hours (SCG).

3:ANIMAL EXPERIMENTS: Oxalic acid binds metal ions, primarily calcium and magnesium, disturbing the ion balance (SCG, ACGIH), and forming insoluble salts which can be deposited in various organs. These depositions can cause inflammation and fibrosis in kidney parenchyma and heart muscle (SCG).

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Feeding rats 1250 or 2500 mg/kg for 70 days caused reduction in body weight and retarded growth (SCG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Iv administration of 40 mg sodium oxalate/kg bw caused calcium oxalate crystals deposition in kidney, heart, lungs and liver within one hour. Sc administration of 75 mg sodium oxalate/kg bw cause disturbances of kidney function and focal necroses, because of the oxalate crystals deposition. In vitro, oxalate inhibits the synthesis of fatty acids and cholesterol from lactate in chicken heptocytes (SCG).

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Direct contact can strongly irritate the skin, eyes and mucous membranes; a 5 - 10% solution (when prolonged exposed) can still cause irritation of the skin (SCG, ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX: 5 grams of oxalic acid has proved to be fatal (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect can not be determined. Direct contact is irritating.

ACGIH: TLV is comparable to those of sulfuric - and phosphoric acid (on a ppm basis).

Casnr: 8002-74-2 Stofnaam: Paraffinewas (rook)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2			Ned:		
USA	1992:	-	2			USA:		
UK	1992:	-	2	-	6	UK:		UK:
BRD	1992:	-				BRD:		BRD:
Den	1992:	-	2			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 47 to 65 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: Paraffin is considered to be nontoxic, although possibly it may in the past have possessed some carcinogenic impurities.

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Work around molten paraffin is reported uncomfortable and nauseating.

LONG TERM TOX: Concentrations below 2 mg/m3 produced no discomfort, whereas in one plant, 0.6-1 mg/m3 was found to be mildly disagreeable.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent irritation of respiratory passages and other unpleasant effects.

Casnr: 56-38-2 Stofnaam: Parathion
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned: Ja		
USA	1992:	-	0.1			USA: Ja		
UK	1992:	-	0.1	-	0.3	UK: Ja		UK:
BRD	1992:	-	0,1			BRD: Ja		BRD:
Den	1992:	-	0,1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

NIOSH recommends a REL of 0.05 mg/m3 TWA with skin notation.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 6 °C

BOILING POINT: 375 °C

VAPOR PRESSURE: 0.0000057 mm Hg (DFG); 0.0000378 mm Hg (ACGIH) (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Parathion is easily absorbed from the skin, the respiratory- and digestive tract and mucous membranes (DFG, NIOSH). There is no accumulation of the compound in the body. There can be a cumulative effect however, when the daily inhibition of blood enzymes exceeds the daily recovery of cholinesterase activity (NIOSH).

BIOTRANSFORMATION: In the liver the compound is transformed into paraoxon, which is a far more active cholinesterase inhibitor. Main metabolites are p-nitrophenol, diethylthiophosphate and diethylphosphate (DFG, NIOSH, ACGIH).
ELIMINATION: 90% of the paration is excreted within 24 hours after iv injection in the urine of monkeys (DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION: Several investigators consider parathion more toxic by inhalation than by ingestion (NIOSH) or skin absorption (ACGIH).

ACUTE TOX (LOC/SYST): LC50 (rats) = 18 ppm (1 hour; damp); 0.115 ppm (1 hour; aerosol); 0.0315 ppm (4 hours; aerosol). exposure to 0.51 ppm (one hour) was lethal for mice (DFG).

SHORT TERM TOX: NEL in rats (6 h/d; 4 months) = 0.4 mg/m3; effect was inhibition of blood cholinesterase (DFG). MAEL in dogs (7 h/d; 5 d/w; 6 weeks) = 0.1 mg/m3; effect is significant inhibition of the blood cholinesterase (NIOSH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mice; female and male rats; guinea pigs and rabbits) = respectively 6.0 - 25.7; 1,75 - 5.0; 5.0 - 30.0; 9.3 - 32.0; and 10.0 mg/kg (DFG).

SHORT TERM TOX: NEL (rats and dogs) = respectively 1 and < 1 ppm (respect. 16 and 24 weeks) effect was cholinesterase inhibition. Dogs fed 2 ppm for 24 weeks showed an obvious inhibition of cholinesterase (= omgerekend 1.12 mg/m3) (DFG).

LONG TERM TOX: When critical effect is clinical toxic symptoms, NEL (rats) = 10 - 20 ppm (two years test) (= omgerekend 2.3 - 4.6 mg/m3).

CARCINOGENICITY: "It is concluded that parathion is unlikely to produce cancer" (NIOSH).

REPRODUCTION TOX: Feeding 30 ppm was reprotoxic in a 3 generation test (with rats?). NEL was 10 ppm (DFG). It produces however no teratogenic effects (DFG, NIOSH).

OTHER STUDIES: Ip and sc LD50 (mice) = respectively 10.4 - 15.1 and 21.4 mg/kg; ip LD50 (rats and guinea pigs) = respectively 2.7 - 5.9 and 12.0 mg/kg (DFG).

3.4:DERMAL: LD50 (rats, rabbits and guinea pigs) = 6.4; 40 and 600 mg/kg respectively (ACGIH).

4:MUTAGENICITY: "It is concluded from several studies that parathion is unlikely to produce mutations " (NIOSH).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: 1-3 mg/kg bw can be lethal for adults; 0.1 mg/kg for children (DFG).

SHORT TERM TOX: Average concentrations of 0.2 - 0.3 mg/m3 caused only limited inhibition of cholinesterase in twelve workers. In several oral tests, NEL (25

to 70 days) = 0.05 mg/kg (= omgerekend 3.5 mg/m³); effect = inhibition of cholinesterase (DFG, NIOSH). During spraying measured concentrations are 0.05 - 0.5 mg/m³ (DFG, ACGIH)).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Despite the lacking of enough toxicity data to establish a MAK-Wert, the recent MAK seems to suffice.

NIOSH: REL is based on the human and animal inhalation data, in which 0.05 mg/m³ is determined as a NEL for humans.

ACGIH: 2 and 0.5 mg/m³ seem excessive exposures. "0.1 mg/m³ provides the best estimate for a TWA-TLV".

Casnr: 76-01-7 Stofnaam: Pentachloorethaan
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	5	40			Ned:	Nee	
USA	1992:					USA:		
UK	1992:					UK:		UK:
BRD	1992:	5	40	10	80	BRD:		BRD:
Den	1992:	5	40			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

Deze MAC is in 1977 opgenomen in onze MAC-lijst, als een van de MAC-waarden waar de Duitse MAK-commissie een MAK voor had. Er bestaat geen Duitse onderbouwing voor deze stof, noch een onderbouwing van de ACGIH.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: °C
BOILING POINT: °C
VAPOR PRESSURE: mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

Casnr: 87-86-5 Stofnaam: Pentachloorfenol
Synoniemen: PCP

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0.06			Ned: Ja		
USA	1992:	-	0.5			USA: Ja		
UK	1992:	-	0.5	-	1.5	UK: Ja		UK:
BRD	1992:	-	-	-	-	BRD: Ja	IIIA2	BRD:
Den	1992:	0,05	0,5			Den: Ja		
Zwed	1990:	-	0,5	-	1,5	Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 189 °C

BOILING POINT: 309 - 310 °C with decomposition

VAPOR PRESSURE: 0.00017 mm Hg (at 20 °C)

2:TOXICOKINETICS: PCP disturbs the cellular energy metabolism (DFG, SCG). Human kinetics are very comparable with the rat (DFG).
UPTAKE AND DISTRIBUTION: PCP is absorbed via the lungs, the skin and digestive tract (DFG, SCG). Especially skin absorption is quite effectively (SCG, ACGIH). After inhalatory, oral and ip administration, highest levels are found in the liver and kidneys (DFG) and blood (SCG) of rats. PCP passes through the placenta of monkeys (SCG).

BIOTRANSFORMATION: PCP is biotransformed into tetrachlorohydroquinone (DFG).
ELIMINATION: Tetrachlorohydroquinone or its glucuron conjugate is excreted in the urine (80%) or the faeces (19 - 34%) with halftimes of 6.3 - 27 hours in rats and mice; halftime in humans is 30 hours; 74-88 and 12% are excreted in the urine as respectively free PCP and the glucuronid (DFG, SCG); 4% is excreted via the faeces. Urine levels in occupational exposed workers are 1 mg/l; in the whole population this value is about 0.01 mg/l (DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): PCP is a strong irritant for eyes and skin, probably dependent on the used solvent. Pure PCP did not cause chloracne on the rabbits ear (DFG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (10 - 20 min) for rats = 900 mg/m3 (DFG); or 335 and 225 mg/m3 for respectively rats and mice (ACGIH). Toxic signs were high blood pressure, hyperthermia, hyperglycemia, glucosuria, muscle weakness, etc.

SHORT TERM TOX: Exposure to industrial-grade PCP induced reduced hemoglobin levels and - red blood cell counts in rabbits and rats (SCG). MAEL in rats and rabbits (4 h/d; 6 d/w; 4 months) is 3 mg/m3; effect was increased liver weight and changes in cholinesterase activity and bloodglucose-level (DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats, mice) = respectively 27 - 205 mg/kg and 74 mg/kg (DFG).
SHORT TERM TOX: NEL for rats, receiving industrial-grade PCP (3 months) was 1.25 mg/kg (= omgerekend 5.75 mg/m3); 3 mg/kg caused increase in liver weight.

Purified PCP had no toxic effect on the liver of animals below 10 mg/kg (SCG, DFG). MAEL with industrial PCP (8 months) in rats was 1 mg/kg bw (= omgerekend 4.6 mg/m3); effect was increase in liver enzyme activity. With purified PCP, NEL was 5 mg/kg bw (= omgerekend 23 mg/m3) (DFG).

LONG TERM TOX: NEL in male and female rats (2 years) = respectively 10 and 3 mg/kg (= omgerekend 46 and 13.8 mg/m3). Critical effect was deposition of pigmentation in kidney cells (DFG).

CARCINOGENICITY: (Daily?) Iv injection of 46.4 mg/kg caused a higher incidence of hepatomas in male mice. Several oral carcinogenicity studies with mice and rats were negative, as was a tumor promotor test with mice (SCG, DFG). One EPA study revealed "clear evidence of carcinogenicity" in mice at doses of 100 ppm (= according to DFG: 17.5 mg/kg). Liver tumors (adenomas and carcinomas), pheochromocytomas and hemangiosarcomas (in liver and spleen) were found (DFG).

REPRODUCTION TOX: NEL = 5 and < 5 mg PCP/kg (respectively industrial - and purified PCP) for fetotoxicity (administered day 6 to 15 of gestation); 5 to 50 mg/kg did not induce any teratogenic effects in rats (SCG). NEL for fertility (purified PCP) in male and female rats = 3 mg/kg.

OTHER STUDIES: LD0 iv in rabbits = 22 mg/kg (ACGIH).

3.4:DERMAL: LD50 (rats) = 90 (ACGIH) - 149 mg/kg (DFG). After dermal absorption, vascular injury and heart failure results (ACGIH).

4:MUTAGENICITY: Most (DFG) mutagenicity tests were negative (SCG), although a *S. cerevisiae* test revealed DNA damage, SCE without S9-mix was positive and chromosome aberrations were found in CHO-cultures with S9-mix (DFG).

5:OBSERVATIONS IN MAN: Most human data involve industrial PCP, including their impurities (DFG).

IRRITATION (SK/MM/EY/RESP): Reported cases of chloracne might as well be contributed to impurities in the technical PCP (DFG, SCG). Concentrations in work-air over 1 mg/m³ caused painful irritation of the mucous membranes of the nose; "hardened workers" can tolerate 2.4 mg/m³ (DFG, ACGIH). 0.3 mg/m³ can cause some irritation of the nose (ACGIH).

SENSITIZATION (SK/RESP):

ACUTE TOX: Estimated lethal dose is 30 mg PCP/kg. Symptoms include: weight loss, desorientation, vomiting, nausea, dyspnea, fever, impairments in autonomic function and circulation, etc (DFG, ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Cases of aplastic anemia have been reported in people exposed to PCP and solvents (SCG); DFG questions the causality. Relationships between (penta)chlorophenol and some kinds of cancer have been described (SCG), and questioned (DFG). Complaints of neuropathy in workers could not be confirmed in tests, although changes in neurologic electrodiagnostics were found in workers exposed to 0.02 mg/m³ during 3 to 12 years. Several studies for chromosomal aberrations are reported, with negative or doubtful results. No reprotoxic effects were found in wives of occupational exposed workers. Most reported work-air concentrations were below 0.5 mg/m³ (DFG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "Critical effect for the industrial product seems to be carcinogenicity".

DFG: PCP is only weakly genotoxic, but convincingly carcinogenic in mice, so a IIIA2 notation is added.

ACGIH: TLV is set in analogy with other compounds of similar action and toxicity, and is believed to be low enough to prevent vascular injury.

Casnr: 1321-64-8 Stofnaam: Pentachloornaftaleen
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	0,05	0,5			Ned:		
USA	1992:	-	0.5			USA:		
UK	1992:					UK:		UK:
BRD	1992:	-	0,5	-	1,0	BRD:	Ja	BRD:
Den	1992:	-	0,5			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 120 °C

BOILING POINT: 326.67 to 371.11 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Rats who were 143 times exposed to 1.44 mg/m3 of a mixture of penta- and hexachloronaphtalene (8-hour expositions) showed hepatic changes.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: One investigator administered various chlorinated naphtalenes to calves and found the toxicity to increase with the degree of chlorination up to the hexa- and heptachlorinated compounds.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Exposition to chlorinated naphtalenes (the major component being pentachloronaphtalene) resulted in several cases in toxic hepatitis (jaundice), sometimes fatal, and outbreaks of chloracne. In general, the toxicity increases with the degree of chlorination.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on a recommendation of a researcher (in 1937) of 1 mg/m3 as a safe limit for a mixture of tetra- and pentachloronaphtalene, and 0.5 mg/m3 for a mixture of pentachloronaphtalene with the hexachloro- derivative.

Casnr: 107-87-9 Stofnaam: Pentanon (2-)
Synoniemen: Methylpropylketon; Ethyl aceton; MPK

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	200	700			Ned:	Nee	
USA	1992:	200	705	250	881	USA:		
UK	1992:	200	700	250	875	UK:		UK:
BRD	1992:	200	700	400	1400	BRD:		BRD:
Den	1992:	200	700			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -78 °C

BOILING POINT: 102.2 °C

VAPOR PRESSURE: 27 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Maximal exposure concentration for several hours without significant symptoms in animals was 1500 ppm. Exposure at 2000 ppm during four hours was lethal for some of a group of rats. A concentration of 2500 ppm was irritating to guinea pigs and caused weakness; 5000 ppm was needed to produce coma.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure at 1500 ppm was severely irritating to man.

SENSITIZATION (SK/RESP):

ACUTE TOX: Acute effects of MPK vapor are narcosis and irritation of the eyes and respiratory passages.

SHORT TERM TOX:

LONG TERM TOX: So far is known, it does not cause chronic poisoning; there are no reports of ill effects resulting from its use in industry (in 1965).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is believed to prevent narcotic effects and significant irritation.

Casnr: 594-42-3 Stofnaam: Perchloormethylmercaptan
Synoniemen: PCM

	tgg	Mg/m3	STEL	Huidno-	Carcino-	Sensibili-
	Ppm		Ppm	tatie	geen	serend
Ned	1994: 0,1	0,8		Ned:	Nee	
USA	1992: 0.1	0.76		USA:		
UK	1992:			UK:		UK:
BRD	1992:			BRD:		BRD:
Den	1992: 0,1	0,8		Den:		
Zwed	1990:			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 147.5 - 149 °C with decomposition
VAPOR PRESSURE: 64 mm Hg (at 70 °C)
ODOR THRESHOLD : 0.001 ppm

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION: Only hypotheses are described (DFG).
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): PCM is a severe skin, eye and pulmonary irritant (ACGIH).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Toxic signs are dyspnea and lung edema. LC50 (mice, rats) = respectively 9 and 10 - 22 ppm (3 resp. 1 h exposure). Exposure to 45 ppm (one hour) was lethal for cats and mice (ACGIH, DFG).

SHORT TERM TOX: NEL (rats) = between 0.12 and 1 ppm; 1 ppm (6 h/d; 5 d/w; 2 weeks) caused labored breathing (lung edema), tremors and mild nasal irritation (ACGIH). NEL in rats = 0.5 ppm (6 h/d; 5 ed/w; 4 weeks) (DFG, ACGIH);

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 83 mg/kg (DFG, ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 (iv, mice) = 56 mg/kg (DFG).

3.4:DERMAL: LD50 (rabbits) = 1410 mg/kg (4 h application) (DFG, ACGIH).

4:MUTAGENICITY: PCM inhibits DNA-polymerase activity in isolated bovine liver nuclei and is (without metabolic activation) mutagenic in DNA-polymerase deficient E. coli (DFG, ACGIH). The working mechanism is very like that of Captan, of which mutagenicity is proved (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): LAEL = 10 mg/m3 (DFG) or 1.8 mg/m3 (ACGIH) (effect = irritation of the eyes). 70 mg/m3 should be unbearable (DFG).

SENSITIZATION (SK/RESP):

ACUTE TOX: Three cases of acute intoxication by accidents are reported, one of which fatal. Most important "systemic" symptom of the survivors was lung edema (DFG, ACGIH). The dead person showed degenerative changes of the liver, lungs, kidneys, adrenals and brain (DFG).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Data to establish a MAK are lacking, especially carcinogenic studies are sincerely needed.

ACGIH: No reports of adverse effects at the TLV-level are present, so no change is recommended.

Casnr: 7616-94-6 Stofnaam: Perchlorylfluoride
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	3	14			Ned:		
USA	1992:	3	13	6	25	USA:		
UK	1992:	3	14	6	28	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	3	14			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -147.7 °C

BOILING POINT: -46.8 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): In a sub-chronic test (6 months; see short term tox.) there was no sign of irritation at the 24 ppm exposition level.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rats, 4-hour exp.) = 385 ppm; (mice, 4-h exp.) = 630 ppm. Dogs, exposed to 220-450 ppm (for 4h) and 620 ppm (for 2.5h) were cyanotic and hyperpneic, with methemoglobin values of 29-71%. Dogs who died showed areas of pigment deposition in the liver, spleen and bone marrow; aress of alveolar hemorrhage, collapse and emphysema.

SHORT TERM TOX: Exposure at 185 ppm; 6h/d; 5 d/w; 7 weeks, was lethal for most of the exposed rats, mice and guinea pigs. Toxic signs were difficult breathing; cyanosis and methemoglobinemia; fluorosis; patchy areas of consolidation of rats'lungs; splenomegaly; hemosiderosis of the spleen, liver and kidney; and alveolar edema, developing in bronchopneumonia. On similar exposures at 104 ppm for 6 weeks, all of ten guinea pigs died, and one of 20 rats. Similar signs and anatonmic changes were observed. Blood-, urinary- and rat femur fluorine levels increased about 5-30 fold.

Exposure at 24 ppm, for 6 months, resulted in death for 14 out of 30 guinea pigs, but no deaths appeared in rats and dogs. The deaths of the guinea pigs were attributed to infection with B. bronchoseptica. Bone fluoride levels in guinea pigs were about four times control levels, and in rats three times control levels. Dogs had about 50% increase in bone fluoride. In guinea pigs there was an increase in normoblasts and a slight (nonsignificant) decrease in total hemoglobine. In dogs there was a two-fold increase in the indirect fraction of serum bilirubine.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Brief exposure to unknown concentrations of perchloryl fluoride, resulted in symptoms of upper respiratory irritation.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is expected to prevent fluorosis and effects on the blood, since it is little more than one tenth of the 24 ppm, which produced fluorosis and slight evidence of blood destruction in

experimental animals.

Casnr: 8075-36-3 Stofnaam: Perliet
Synoniemen:

	tgg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	10*	Ned:	Nee	
USA 1992:	-	10	USA:		
UK 1992:			UK:		UK:
BRD 1992:			BRD:		BRD:
Den 1992:			Den:		
Zwed 1990:			Zwed:		Zwed:

Perlite is an amorphous mineral consisting of fused sodium potassium aluminium silicate. This document considers perlite containing < 1% quartz.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: °C

BOILING POINT: °C

VAPOR PRESSURE: mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: "No data were found in the literature to indicate that exposure to perlite dust, either to the ore or to the expanded form, has resulted in adverse physiological effects. TLV is set for perlite containing less than 1% crystalline silica at the level for nuisance dust. Since perlite has little adverse effect on the lungs and does not produce significant organic disease or toxic effect when exposures are kept under reasonable control, TLV for respirable dust is eliminated.

Casnr: 1918-02-1 Stofnaam: Picloram
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:		10			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: ~ 215 °C. The compound decomposes before melting or boiling.
VAPOR PRESSURE: 0.000000616 mm Hg (at 35 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Picloram has low irritating properties.
SENSITIZATION: (SK/RESP):

3.2:INHALATION: "The low vapor pressure of picloram essentially eliminates the possibility of inhalation of vapors."

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 in rast, mice and rabbits = 3.75; 1.5 and 2.0 g/kg respectively.

SHORT TERM TOX: In a 90 day test, feeding 225 mg/kg/day, female rats showed moderate changes in the liver and kidneys and slight decreases in body weights. (= omgerekend 1035 mg/m3). Feeding 750 mg/kg to rats caused toxic signs.

LONG TERM TOX: In a two year feeding test, the NEL in rats and dogs was 150 mg/kg/day (highest dose tested). (= omgerekend 690 mg/m3 voor de rat en 2400 mg/m3 voor de hond).

CARCINOGENICITY: Picloram was not carcinogenic at doses of 7437 or 14,875 ppm in rats; and 2531 or 5062 ppm in mice (= omgerekend 961 en 1922 mg/m3) during 80 weeks.

REPRODUCTION TOX: In a three generation fertility, reproduction and lactation study with rats, feeding 3000 ppm showed no effects (= omgerekend 690 mg/m3). Feeding up to 1000 mg/kg picloram to rats on days 6-15 of gestation, caused no teratogenic nor adverse effects on neonatal development.

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should provide a wide margin of safety from systemic effects.

Casnr: 83-26-1 Stofnaam: Pivalyl-1,3-indandion (2-)
Synoniemen: Pindone

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 108.5 to 110.5 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: Critical lethal dose for house mice = 4.3 mg/kg (= omgerekend 30 mg/m3). LD50 (Norwegian rat) = 10.3 mg/kg (= omgerekend 72 mg/m3).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX: Some patients, treated with phenindione (based on the same chemical structure) showed granulocytosis and hepatitis.
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on analogy (?) with warfarin.

Casnr: 7440-06-4 Stofnaam: Platina
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	5			UK:		UK:
BRD	1992:	-	?			BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:					Zwed:		Zwed:

There is a DFG document: "Platina and compounds". There is one MAK-Wert for both Platin and his compounds of 0.002 mg/m3.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 1769 °C

BOILING POINT: ~3827 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: There is very little resorption from lungs and intestines. After exposure of rats to metallic Pt, (48 min; 7 - 8 mg/m3) the highest concentration in internal organs is reached in the kidneys, but the concentration in the respiratory tract remains very high during at least 8 days (DFG).

BIOTRANSFORMATION:

ELIMINATION: Pt is slowly eliminated from the body, depending on the means of administration.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: After feeding fine Pt dust (diameter 1 - 5 µm) necrotic changes of the mucous membranes of the gastrointestinal tract were found, together with granulated dystrophia of the hepatocytes and epithelial changes of the renal tubuli.

LONG TERM TOX:

CARCINOGENICITY: Implanting metallic Pt-objects intra-uterine did not show any carcinogenic properties.

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP): There is one reported case of contact-dermatitis caused by metallic Pt (DFG). "Most of the authorities emphasized that the dust of metallic platinum caused no difficulty" (ACGIH).

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: There is one MAK for Pt and compounds. The DFG is not sure whether the MAK will protect against sensitization.

ACGIH: TLV can be higher than for Pt compounds, since "this exposure has not been associated with the development of allergic disease".

Casnr: 107-19-7 Stofnaam: Propargylalcohol
Synoniemen: Prop-2-yn-1-ol

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	1	2			Ned:	Ja	
USA	1992:	1	2.3			USA:	Ja	
UK	1992:	1	2	3	6	UK:	Ja	UK:
BRD	1992:	2	5			BRD:	Ja	BRD:
Den	1992:	1	2,5			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -48 to -52 °C
BOILING POINT: 114 - 115 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Propargyl alcohol is a primary skin irritant.
SENSITIZATION: (SK/RESP): Propargyl alcohol is not a sensitizer.

3.2:INHALATION:
ACUTE TOX (LOC/SYST): LC50 (two-hour exposure) for rats and mice = about 850 ppm.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 of rats; guinea pigs and mice = 70; 60 and 50 mg/kg respectively.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the structural and apparent toxicological similarity to allyl alcohol.

Casnr: 627-13-4 Stofnaam: Propylnitraat (n-)
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	25	110			Ned:		
USA	1992:	25	107	40	172	USA:		
UK	1992:					UK:		UK:
BRD	1992:	25	110			BRD:		BRD:
Den	1992:	25	110			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: < -101 °C
BOILING POINT: 110 °C at 762 mm Hg.
VAPOR PRESSURE: 18 mm Hg (at 20 °C)
ODOR THRESHOLD: 50 ppm.

2:TOXICOKINETICS: Propyl nitrate has a direct action on vascular smooth muscle and the hypotensive action of the compound is probably responsible for the occurring cardiac effects and respiratory depression.

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure at 10,000 ppm for four hours produced cyanosis, methemoglobinemia and death in rats. LC50 (four hour exposure) in rats; mice and dogs are 9000-10,000; 6000-7000 and 2000-2500 ppm respectively.

SHORT TERM TOX: Exposure of dogs at 260 ppm (6 h/d; 5 d/w; six months) produced slight clinical signs in the first two weeks of the study. These signs disappeared and no dogs died during the study.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Iv LD50 in unanesthetized rabbits = 200-250 mg/kg. In anesthetized dogs and cats, iv doses of 100-200 mg/kg were fatal.

3.4:DERMAL: Repeated application can cause inflammation and thickening of the skin. Its percutaneous toxicity is low, although some signs and symptoms resulting from repeated absorption may occur. They become less severe or disappear on continued exposure.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV seems to represent a concentration with a reasonable factor of safety from systemic effects. Additional data however are needed.

Casnr: 8003-34-7 Stofnaam: Pyrethrum
Synoniemen:

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	5	-	50	BRD:		BRD: Ja
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: it is a resin or solid.
VAPOR PREESURE: ~0 mm Hg (at 20 °C).

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Lung irritation resulted in dogs and rats from
exposition for 30- minute periods, 31 days at 16 mg/m3.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Rats, who were exposed 30 min. to 6000 mg/m3 of pyrethrum
in peanut oil, had moderate lung congestion.

SHORT TERM TOX: Rats and dogs, who were exposed to 16 mg/m3, 31 days for
30-minute periods, had slight lung irritation.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 1500 mg/kg or 820 mg/kg.

SHORT TERM TOX: Animals fed diets containing less than 500 ppm, showed no gross
effects (time?).

LONG TERM TOX: No effects were reported in rats fed 1000 ppm for two years
(=NEL, = omgerekend 350 mg/m3). At a feeding level of 5000 ppm, tissue damage
and gross signs resulted.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rat) = > 1800 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP): Contact with pyrethrum can result in allergic
dermatitis. (No exposure estimates were made).

ACUTE TOX: Fatal human dose is estimated at 1430 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is believed to be low enough to
prevent systemic effects.

Casnr: x Stofnaam: Pyrolyseprodukten van harskern van soldeertin
Synoniemen: Rosin core solder pyrolysis products (as formaldehyde)

		tg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	0,1			Ned:	Nee	
USA	1992:	-	0.1			USA:		
UK	1992:	-	0.1	-	0.3	UK:		UK: Ja
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Thermal decomposition products, produced by soldering may be irritating to the membranes of the eyes, nose and throat.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: A 2-week exposure of guinea pigs and rats, to an average concentration of 0.96 mg/m3 of thermal decomposition products produced by soldering, produced no alterations in the formed elements of the blood, blood urea nitrogen and serum alkaline phosphatase. In male guinea pigs, some depression in body-weight gains and abnormal liver to body-weight ratios occurred. In male rats abnormal heart to body-weight ratios occurred. There were no microscopic changes in sections of these organs. The lungs of both the exposed and the control animals showed moderate to extreme hyperemia, so no conclusions could be drawn concerning lung damage.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Volunteers experienced slight bronchial irritation at levels around 1 mg/m3. Workers showed signs of upper respiratory irritations in rooms with concentrations of rosin pyrolysis products of 0.15 mg/m3, but not in rooms where concentrations were maintained below 0.1 mg/m3.

Eighty percent of volunteers, exposed at concentrations above 0.12 mg/m3 aldehydes reported moderate to severe irritation of the eyes, nose or throat. Less than 10% reported irritation at a concentration below 0.05 mg/m3. At a concentration of 0.07 mg/m3 of aliphatic aldehydes as formaldehyde, thirty percent of the volunteers reported irritation of the mucous membranes.

Adaptation to the pyrolysis products occurred quickly and was quickly lost. A few subjects, however stated that irritation was severe at or above 0.1 mg/m3.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should provide adequate short- and long-term protection, in seasoned workers.

Casnr: 108-46-3 Stofnaam: Resorcinol
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	10	45			Ned:	Nee	
USA	1992:	10	45	20	90	USA:		
UK	1992:	10	45	20	90	UK:		UK:
BRD	1992:	10	45			BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 109 - 111 °C

BOILING POINT: 281 °C

VAPOR PRESSURE: 1 mm Hg (at 108.4 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure to 1733 ppm resorcinol-water aerosol (one hour) or 625 ppm (eight hours) caused no toxic symptoms in "the" exposed animals.

SHORT TERM TOX: Exposure to 8 ppm (6 h/d; two weeks) produced no toxic effects in rats, guinea pigs and rabbits.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 301 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): None of the workers exposed to 10 ppm complained of irritation or discomfort.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

ACGIH: TLV is based on the above information.

Casnr: 7440-16-6 Stofnaam: Rhodium (damp en stof)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	0.1	-	0.3	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1960 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: There are no data in the literature demonstrating either acute or chronic rhodium related diseases or irritation in humans by rhodium or its compounds.

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):

ACUTE TOX:
SHORT TERM TOX:

LONG TERM TOX: "In a major precious metal refinery, procedures which were abandoned for the refining of platinum because of cases of sensitization, have been carried out for years with analogous rhodium compounds without any problems."

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: For rhodium metal, the same TLV as for platinum is recommended; in 1982 the TLV was raised from 0.1 to 1 mg/m3.

Casnr: x Stofnaam: Rhodium in water oplosbaar
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,001			Ned:		
USA	1992:	-	0.01			USA:		
UK	1992:	-	0.001	-	0.003	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,001			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1960 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS: Rhodium (I) carbonyl acetylacetonate is toxic.

3.1:IRRITATION (SK/MM/EY/RESP): Rhodium (I) carbonyl acetylacetonate is an eye irritant.

SENSITIZATION: (SK/RESP): Rhodium (I) carbonyl acetylacetonate is a skin sensitizer, type IV. Sodium rhodium chloride and the chloropentaamine are not sensitizers.

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 of common rhodium compounds (eg RhCl3; Na3RhCl6) > 500 mg/kg in rats.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY: Mice which received 5 ppm rhodium trichloride in their drinking water from weaning to natural death, had a significant higher tumor incidence (omgerekend 4,75 mg/m3).
REPRODUCTION TOX:
OTHER STUDIES: Rhodium trichloride showed low toxicity after iv administration; LD50 was 198 and 215 mg/kg for rats and rabbits respectively. Iv injection of 60 mg/kg produced no systemic reaction in rats or rabbits.

3.4:DERMAL:

4:MUTAGENICITY: RhCl3 is a potent mutagen in recombinant-repair-deficient assays. In genetic differential repair- and mutagenicity assays, 10 of 19 rhodium compound were defined as active.

5:OBSERVATIONS IN MAN: There are no data in the literature demonstrating either acute or chronic rhodium related diseases or irritation in humans by rhodium or its compounds.

IRRITATION (SK/MM/EY/RESP): No human problems have been encountered during the handling of Rhodium (I) carbonyl acetylacetonate.

SENSITIZATION (SK/RESP): No human problems have been encountered during the handling of Rhodium (I) carbonyl acetylacetonate.

ACUTE TOX: No human problems have been encountered during the handling of Rhodium (I) carbonyl acetylacetonate.

SHORT TERM TOX:

LONG TERM TOX: "In a major precious metal refinery, procedures which were abandoned for the refining of platinum because of cases of sensitization, have been carried out for years with analogous rhodium compounds without any problems."

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: "In view of the above, the former TLV of 0.001 mg/m3 appeared inappropriate. The Committee recommended a raising of the TLV to 0.01 mg/m3, which has been accomplished in 1984.

Casnr: 83-79-4 Stofnaam: Rotenon
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	5			BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 163 °C

VAPOR PRESSURE: ~ 0 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 132-1500 mg/kg; (mice) = 350 mg/kg. Rotenone is particularly toxic to fish and pigs.

SHORT TERM TOX:

LONG TERM TOX: Rats tolerated 2 ppm of relatively pure rotenone for two years without effect (NEL = omgerekend 0,7 mg/m3); a level of 5 ppm (= omgerekend 1,75 mg/m3) produced tissue damage.

CARCINOGENICITY: When given ip for 2-3 months, at dosages of 0.1-0.2 mg/rat/day (uitgaande van een lichaamsgewicht van 250 g voor vrouwelijke ratten is dit omgerekend 2,8 - 5,6 mg/m3), rotenone is capable of inducing breast tumors in Wistar rats. At 18 months, the mean incidence of tumor fo%.

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Since human experience has been generally favorable, the TLV of 5 mg/m3 is retained.

Casnr: 1309-37-1 Stofnaam: Rouge
 Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Casnr: x Stofnaam: Rubber solvent
Synoniemen: Naphta

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	400	1600			Ned:		
USA	1992:	400	1590			USA:		
UK	1992:					UK:		UK: Nee
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
BOILING POINT: 70 to 130 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): LC50 in rats (4-hour exposure) = about 15,000 ppm. At 24,000 ppm all rats developed convulsions and died. Motor incoordination was observed at 5300 ppm. No toxic signs were seen when exposed at 2800 ppm. Exposure at 480 ppm caused no toxic signs in rats and dogs.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: "Exposure at 430 ppm caused only slight eye and throat irritation."
SHORT TERM TOX: "63-day exposure at 430 ppm produced only slight eye and throat irritation."
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: NIOSH has recommended a TLV of 85 ppm. "This may be based on the assumption that all alkane in the range C5-C8 are metabolized, as is n-hexane, by the animal to yield neurologically toxic substances. There is sufficient evidence to examine all solvents for the normal hexane content to keep the inhalation exposure level of n-hexane below 100 ppm". TLV is recommended on basis of the above statement, and in consistency with "recommended exposure levels for hydrocarbon in this category".

Casnr: 57-50-1 Stofnaam: Saccharose
 Synoniemen: Sucrose

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Geen onderbouwing aanwezig.

Casnr: 7440-21-3 Stofnaam: Silicium
Synoniemen: Silicon

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	10			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1410 °C
BOILING POINT: 2355 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS: Elementary silicon appears to lack the property of causing fibrosis in lung tissue.

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: Ip injection of elemental silicon gave an inert dust response in guinea pigs and rats. After intratracheal injection of 25 mg silicon dust in rabbits, slight pulmonary lesions were found.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Only a total (nuisance) dust TLV-TWA is recommended for silicon, because it seems to have little adverse effect on lungs and it does not appear to produce significant organic disease or toxic effects when exposures are kept under reasonable control.

Casnr: 409-21-2 Stofnaam: Siliciumcarbide
Synoniemen: Siliconcarbide

	tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	-	10*			Ned:		
USA 1992:	-	10			USA:		
UK 1992:	-	10*			UK:		UK:
BRD 1992:	-	-			BRD:	IIIA2	BRD:
Den 1992:					Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: dissociates above ca. 2200 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Inhalation studies have been performed to investigate the fibrogenic action of SiC in animals. Guinea pigs were exposed to SiC-dust in unspecified concentration (8 h/d; 7 months; dustparticles were 0.3 - 43 µm; 75% < 1.5 µm). Fibrosis was detected in bronchial lymphnodes several times, but not in the lungs (DFG, ACGIH).

LONG TERM TOX: Guinea pigs exposed to 44.5 mg/m3 (average) (6 h/d; 5 d/w; one year) showed no remarkable pathological changes in the lungs (ACGIH) and neither did guinea pigs who were exposed to 4.59 - 675 mppcf (= according to ACGIH calculations 0.7 - 104 mg/m3) (3 h/d; 5 d/w; three years) (DFG).

CARCINOGENICITY: Rats who had been implanted 40 mg SiC fibers (thickness < 0.25 µm and length > 8 µm) in the pleural cavity, had a (calculated) 100% chance of developing pleurosarcomas (DFG).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip injection of 0.2 g SiC (diameter about 1 µm) in guinea pigs did not produce fibrosis nor necrosis within one year (DFG).

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Several studies are reported in which long term exposure (10 - 15 years) to SiC has resulted in fibrosis and pneumoconiosis also when the SiC contained less than 1% quartz. Concentrations were not always given, but in one study varied from 6.5 and 212 mppcf (= according to ACGIH calculations 1 to 33 mg/m3) (DFG) with a mean of 34 mppcf (= 5.2 mg/m3) (ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Because of the carcinogenic potential of SiC-fibers, this MAK only counts for fiber-free SiC. MAK is set at 4 mg/m3 because SiC is possibly contaminated with > 1% quartz.

ACGIH: "SiC seems to have little adverse effect on lungs and does not appear to produce significant organic disease or toxic effects." Nuisance dust TLV is recommended.

Casnr: 7803-62-5 Stofnaam: Siliciumtetrahydride
Synoniemen: Silaan

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	0,5	0,7			Ned:		
USA	1992:	5	6.6			USA:		
UK	1992:	0.5	0.7	1	1.5	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,5	0,7			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -185 °C

BOILING POINT: -111.8 °C (decomposes at 400 °C)

Silane is a high acute local hazard compound.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Chronic and systemic effects are unknown.

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Rats exposed at 126 ppm for one hour were apparently unaffected. Six rats survived 6-hour exposure at 1400 ppm.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The limit of 0.5 ppm seemed unnecessarily restrictive. In 1983, TLV was raised to 5 ppm. "Workers exposed at concentrations of this order, especially if on a repeated or continuous basis, should be watched for signs of intoxication, until more data are available."

Casnr: 14378-12-2 Stofnaam: Speksteen
Synoniemen: Soapstone

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
							serend
Ned	1994:	-	5			Ned:	
USA	1992:	-	5*			USA:	
UK	1992:					UK:	UK:
BRD	1992:					BRD:	BRD:
Den	1992:					Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

Soapstone does not have a precise mineralogic connotation.

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip injection in guinea pigs caused inert reactions.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Workers who were exposed to soapstone with a 10% tremolite content, were studied.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the 1935 study of soapstone-exposed workers.

Casnr: x Stofnaam: Stearaten (uitz. die van toxische metalen)
Synoniemen:

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	tatie	geen	serend
Ned	1994:	-	10		Ned:	Nee	
USA	1992:	-	10		USA:		
UK	1992:				UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992:				Den:		
Zwed	1990:				Zwed:		Zwed:

It concerns: Aluminium di-, tri- en monostearate; Ammonium stearate; Calcium stearate; Glyceryl stearate; Lithium stearate; Magnesium stearate; Potassium stearate; Sodium stearate; Zinc stearate.

1:PHYSIOCHEMICAL PROPERTIES:
Various.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): 10% Al- distearate in corn oil was minimal - and 100% ammonium stearate was slightly irritant for the rabbit skin and both were minimal to mild eye irritants. 100% Mg-, Na- and Zn-stearate were non-irritating to the skin.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rats) Mg stearate = > 2000 mg/m3; Zn stearate = > 200,000 mg/m3 (1-hour exposition).

SHORT TERM TOX: 50 mg Zn-stearate (in 0.5 ml saline and 0.01 mg egg yolk) given by intratracheal instillation in rats, (daily???) for two months produced alveolar and bronchial damage. 10 mg Ca-stearate (in 0.5 ml saline and 0.01 ml of egg yolk), given by intratracheal instillation (daily???) for 4 to 8 months, produced lung damage including peribronchial sclerosis, alveolar atelectasis, and diffuse bronchiectasis.

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Al-; NH4-; Li-; Mg-; Na- and Zn-stearate are practically non-toxic to rats. Glyceryl stearate has a very low order of acute toxicity.

SHORT TERM TOX:

LONG TERM TOX: Glyceryl stearate has a very low order of chronic toxicity.

CARCINOGENICITY: Rats fed stearic acid at 0.3% in their diet for 209 days developed no tumors (= omgerekend 1050 mg/m3).

Sc injection in mice, at doses of 0; 0.05; 0.5 and 1.0 mg stearic acid, 1; 2 and 3 times a week for up to 114 injections, resulted in no tumors, except for four out of a group of ten animals receiving 114 injections of 0.05 mg twice weekly, that developed local sarcomas.

In another study rats were given 0.05 and 0.5 mg stearic acid sc, weekly for 26 weeks. They developed no sarcomas at the site of injection. It was concluded that stearic acid was not a carcinogen by these procedures. Chronic testing with glyceryl stearate has not demonstrated any adverse effects on tumor initiation or tumor promotion.

REPRODUCTION TOX: Mg-stearate was not found to be teratogenic in rabbits. Rats receiving 12-15% glyceryl stearate in their diet over 3 generations (= omgerekend 42.000 - 52.500 mg/m3), showed no adverse effect, nor did any other chronic testing.

OTHER STUDIES: Stearic acid and Mg-stearate pellets implanted in the urinary bladder of mice for 30 weeks produced a tumor incidence of 13% and 5% which was not significantly higher than the tumor incidence produced by smooth glass beads.

3.4:DERMAL: 100% Al- and NH4-stearate have a low potential for dermal toxicity.

4:MUTAGENICITY: Mg-stearate was negative in genetic tests with S. typhimurium.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Twelve cases of infants who developed respiratory distress on

aspiration of zinc stearate powder, are reported.

SHORT TERM TOX:

LONG TERM TOX: One case of pneumoconiosis with probable heart failure is reported in a rubber worker who was occupationally exposed to zinc stearate dust for 29 years. Histological: increase in connective tissue and chronic inflammation, with numerous "granules and needles" in the fibrotic tissue that contained zinc.

Another case of pulmonary fibrosis is described in a worker who had been exposed to zinc stearate dust for 7 years. The zinc level in the lungs was not significantly increased. The authors found no relationship with the exposure to zinc stearate.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should be adequate to protect against adverse health effects in workers exposed to stearates.

Casnr: 10102-43-9 Stofnaam: Stikstofmonoxide
Synoniemen: Nitric oxide; Nitrogen monoxide; Kvaveoxid (Zweeds)

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	25	30			Ned:		
USA	1992:	25	31			USA:		
UK	1992:	25	30	35	45	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	25	30			Den:		
Zwed	1990:	25	30	50	60	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -164 °C

BOILING POINT: - 151.8 °C

VAPOR PRESSURE: 26,000 mm Hg (at 20 °C)

At concentrations above 50 ppm, some of the NO is converted spontaneously into nitrogen dioxide (ACGIH).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Exposure to 0.33 and 5 ppm NO resulted in 80 to 90% uptake via the lungs (SCG).

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Six hours exposure to 322 ppm NO produced 60% methemoglobinemia. Guinea pigs survived an exposure to 175 ppm (unknown period) (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Exposure to 18 mg/m3 for 15 minutes has resulted in increased methemoglobin levels (SCG). Also effects on the central nervous system has been described (ACGIH).

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect seems to be increase in methemoglobin levels.

Casnr: 7783-54-2 Stofnaam: Stikstoftrifluoride
Synoniemen: Nitrogen (tri)fluoride

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	10	29			Ned:		
USA	1992:	10	29			USA:		
UK	1992:	10	30	15	45	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	10	29			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

FREEZING POINT: -206.6 °C

BOILING POINT: -128.8°C

VAPOR PRESSURE: > 750 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Nitrogen trifluoride has a moderate acute toxicity causing anoxic deaths due to methemoglobinemia. Acute exposition results in slight histologic changes in the liver and kidneys, and enlargement and darkening of the spleen. s-GOT levels of rats were unaffected.

SHORT TERM TOX: Daily exposures at 100 ppm; 7h/d; 18 weeks, resulted in mild to moderate pathologic changes in liver and kidneys. There was no effect on the spleen or the hematologic picture, nor evidence of fluorosis in the bones or teeth, although the renal injury was suggestive of excess exposure to fluoride.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Rats, who received 8-15 mg/kg nitrogen trifluoride in a single ip administration, became cyanotic and had enlarged spleens, possibly as a secondary response to the methemoglobinemia.

After nine ip injections, rabbits showed a great increase in size of the spleen, pathologic changes in the liver, and myocardial degeneration. There was considerable difference in species response.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is suggested in analogy with other oxidant gases. They warn against "a potential fluorosis hazard from prolonged inhalation of NF3, since the total fluorine intake would be many times the amount acceptable for HF or fluoride salts, and the chemical reactivity of the compound would suggest the formation of appreciable quantities of fluoride".

Casnr: 57-24-9 Stofnaam: Strychnine
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,15			Ned:		
USA	1992:	-	0.15			USA:		
UK	1992:	-	0.15	-	0.45	UK:		UK:
BRD	1992:	-	0,15	-	0,3	BRD:		BRD:
Den	1992:	-	0,15C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 268 to 290 °C
BOILING POINT: decomposes
VAPOR PRESSURE: ~ 0 mm Hg (at 20 °C).

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 16 mg/kg (= omgerekend 112 mg/m3).
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: LD50 (rat) ip = 0.9-2.3 mg/kg. Lethal doses by iv injection = 0.2 mg/kg for dogs and rabbits.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Swallowing 33 mg resulted in death.
SHORT TERM TOX:
LONG TERM TOX: Continued medication with strychnine may lead to photophobia, muscular rigidity, stiffness in joints, myalgia, lassitude and headache. Its medical use has frequently given rise to poisonings in children.
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent acute or chronic toxic effects from exposure to strychnine.

Casnr: 2699-79-8 Stofnaam: Sulfurylfluoride
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	5	20			Ned:		
USA	1992:	5	21	10	42	USA:		
UK	1992:	5	20	10	40	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	5	20			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: -135.8 °C
BOILING POINT: -55.4 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): The toxicity is reported to be one-half to one-third that of methyl bromide. Acute overexposure may result in tremors with subsequent severe convulsions, and pulmonary edema.

SHORT TERM TOX: On repeated exposure, the compound causes kidney and lung injury.
LONG TERM TOX: Rats, guinea pigs and mice, exposed at 20 ppm; 7 h/d showed significant effects in six months. After twelve months there was slight injury which was reversed after exposure was terminated. Some evidence of fluorosis was observed in the incisors of mice.

CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):

ACUTE TOX: Nausea, vomiting, abdominal pain and pruritis were the major symptoms after an incident of human exposure to sulfuryl fluoride. The day following exposure, the serum was positive for fluoride.

SHORT TERM TOX:
LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should protect against toxic effects, including possible fluorosis on long-continued exposure. The manufacturer of the compound recommended 10 ppm as TLV.

Casnr: 35400-43-2 Stofnaam: Sulprofos
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSICOCHEMICAL PROPERTIES:

BOILING POINT: 125 °C at 0.0075 mm Hg (pure active ingredient)
VAPOR PRESSURE: < 7.88 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Absorption occurs in digestive tract, respiratory tract and through the skin.

BIOTRANSFORMATION: Metabolisation occurs rapidly. The metabolism in rat and cow, involves oxidation of the methylthio sulfur to sulfoxide and sulfone derivatives, and hydrolysis of the phosphorus O-phenylester to phenolic metabolites.

ELIMINATION: Metabolites are excreted primarily in the urine.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): In rabbits, sulprofos is not a dermal- or eye irritant.

SENSITIZATION: (SK/RESP): Sulprofos had not a dermal sensitization effect in guinea pigs.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Four-hour exposition of rats to 4130 mg/m3 produced no mortalities.

SHORT TERM TOX: NOEL in rats (both sexes) in a 3 weeks test, was 6 mg/m3. At 14 mg/m3 females showed a significant depression of the cholinesterase in the blood. No other signs of poisoning were present. Exposures at 74 mg/m3 produced cholinergic symptoms.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 100-300 mg/kg; (mice) = 1600-1800 mg/kg.

SHORT TERM TOX:

LONG TERM TOX: NOELs in a two year feeding study were 10; 6 and 2.5 ppm for dogs; rats and mice respectively (omgerekend 2,45; 2,1 en 1,75 mg/m3). Critical effect was cholinesterase depression in the blood.

CARCINOGENICITY: No oncogenetic effects were found in a two year feeding study with dogs, rats and mice, on feeding levels of 150; 250 and 400 ppm respectively.

REPRODUCTION TOX: Sulprofos; 3; 10; and 30 mg/kg/day showed no no embryotoxic or teratogenic effects in rats and rabbits. In a three generation study in rats, no influence on reproduction was found from 30; 60 and 120 ppm sulprofos.

OTHER STUDIES:

3.4:DERMAL: LD50 (rat) = > 1000 uL/kg; (rabbits) = 800-1000 mg/kg. Sulprofos had no delayed neurotoxic effects in chicken.

4:MUTAGENICITY: Ames test and dominant lethal test in mice were negative.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: No cases of poisoning have been published.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the sub-acute NOEL in rats, with a safety factor of 5, and the oral chronic NOEL of 0.2-0.4 mg/kg/day in laboratory animals.

Casnr: 7440-25-7 Stofnaam: Tantalium
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	5	-	50	BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

This TLV is restricted to Tantalum metal dust and oxide.

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 2996 °C

BOILING POINT: 5425 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): A single intratracheal dose of 100 mg Ta2O5 produced only soft white circumscribed pigmented dust lesions in the lungs of animals.

Transient brochitis, interstitial pneumonitis and associated hyperemia were seen, but no fibrosis.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Ta-oxide was well tolerated by rats in a dosis of 6500 mg/kg (= omgerekend 45.500 mg/m3). LD50 (rats) of TaCl5 = 958 mg/kg as Ta (omgerekend LC50 humaan = 6700 mg/m3). LD50 (rats) of Ta2O5 = > 8.0 g/kg (omgerekend LC50 humaan > 56.000 mg/m3).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 (rats) ip of TaCl5 = 38 mg/kg as Ta; LD50 ip (rats) of K2TaF6 = 173 mg/kg as Ta.

Implants of Tantalum plates and screws have produced no inflammation, edema or microscopic or X-ray noticable irritation in bone or soft tissue in animals after periods of 3 weeks to 3 months; it is inert in biologic tissues.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Tantalum gauze (used in repairs of hernias), or Ta2O5 (used as dressing for burns) did no show adverse effects.

EPIDEMIOLOGICAL STUDIES: Ta2O5 dust is not considered a factor in the pneumoconiosis in the tungsten-carbide industry.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the finding that the compound, as dust and as oxide, is comparatively biologic inert. The TLV is only suggested for these two forms, since there is no information available on other compounds of tantalum.

Casnr: 13494-80-9 Stofnaam: Tellurium en -verbindingen
Synoniemen:

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	0,1			Ned:		
USA 1992:	-	0.1			USA:		
UK 1992:	-	0.1			UK:		UK:
BRD 1992:	-	0,1	-	0,2	BRD:		BRD:
Den 1992:	-	0,1			Den:		
Zwed 1990:	-	0,1			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 450 °C

BOILING POINT: 990 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Hydrogen telluride is highly toxic, causing pulmonary irritation and destruction of red blood cells.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Intratracheal injections of 40 mg of finely divided tellurium oxide cause several deaths in rats, whereas injection of 50 mg of a coarser material was not lethal; particle size appeared to be critical. Injection of 100 mg of tellurium and of the less finely divided tellurium oxide also caused fatalities in rats. Long term effects included lower weight gains of treated animals. 180 days after end of treatment there was no fibrotic tissue respons.

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Tellurite and tellurate are toxic in rats when administered at concentrations of 25 to 50 ppm (= omgerekend 5,75 en 11,5 mg/m3). Elemental tellurium has only a slight effect in growth at a concentration of 1500 ppm (= omgerekend 345 mg/m3).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: The highly toxic hydrogen telluride is a very unstable gas and its occurrence as an actual industrial hazard is very doubtful.

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Occupational exposure resulted in sleepiness, loss of appetite, nausea, metallic taste and a garlic odor to the breath and perspiration, but "no serious illness or death in workers have been reported". Garlical breath or perspiration does not indicate that other symptoms and illnesses are imminent, but is sometimes judged as "socially a handicap". Garlic breath has occurred after ingestion or inhalation of as little as 40 micrograms of tellurium in soluble form.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Concentration at TLV is safe so far as poisoning is concerned, but will probably result in garlic breath among exposed employees.

Casnr: 7783-80-4 Stofnaam: Telluriumhexafluoride
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,02	0,2			Ned:		
USA	1992:	0.02	0.1#			USA:		
UK	1992:					UK:		UK:
BRD	1992:	0,02	0,2			BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -37.6 °C

BOILING POINT: 35.5 °C

VAPOR PRESSURE: > 750 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): An one-hour exposure at 1 ppm produced greatly accelerated respiration but no mortality in animals.

A four-hours exposure at 1 ppm showed evidence of pulmonary edema in animals.

Exposures at 5 ppm or more, were fatal to all animals.

SHORT TERM TOX: Five times a daily one-hour exposure at 1 ppm resulted in "no recognizable injury among the animals".

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Leakage of 50 grams into a small laboratory resulted in acute poisoning with metallic taste; anorexia; lassitude; sleepiness; a rash and bluish-black patches on the skin of the fingers, neck and face, as well as a garlic odor in the breath, sweat and urine. There were apparently no significant pulmonary effects.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the assumption that Tellurium hexafluoride is approximately 2.5 times as acutely toxic as ozone. TLV should protect against the ACUTE toxic effects on the respiratory tract.

Casnr: 3383-96-8 Stofnaam: Temefos
Synoniemen: Abate

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 30 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rats & mice) = > 400 mg/kg. NEL (all tested animals) = 1 mg/kg (critical effect = cholinesterase activity) (omgerekend NEL humaan = 7 mg/m3).
NEL (crit. eff. = clinical effects) = 10 mg/kg (duration of the test???)
SHORT TERM TOX:
LONG TERM TOX: Rat liver carboxylesterases were at least 30 times more sensitive to inhibition than rat cholinesterase.
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX: Volunteers tolerated an oral dose of 256 mg/man/day for 5 days or 64 mg/man/day (omgerekend = 6,4 mg/m3) for 4 weeks without detectable effect on red blood cell- or plasma cholinesterase.
LONG TERM TOX: One mg/L in drinking water for more than one year is without effect. In analogy of the remark in the long term oral study, it might be expected that daily drinking of two liter water containing 1 mg/L temephos, could develop a significant inhibition of liver carboxylesterases. It is recognized that nonspecific liver carboxylesterase is not critical for normal physiologic function, but reduced activity of this enzyme could increase susceptibility to chemicals and drugs that contain carboxylester linkages, e.g. the phthalate esters.
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the comparison with malathion????? (LD50 malathion is about one-half that of temephos; Oral dosage of 24 mg/man/day produced no - and 24 mg/man/day produced some reduction of blood cholinesterase.)

Casnr: 26140-60-3 Stofnaam: Terfenylen
Synoniemen: Diphenyl benzenen

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,5C	4,5C			Ned:		
USA	1992:	0.5C	4.7C			USA:		
UK	1992:	-	-	0.5	5	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,5	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 56.2 °C (o-); 87.4 °C (m-); 212.7 °C (p-).
BOILING POINT: 332 to 381 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Terphenyl mixtures caused conjunctival irritation in rabbits and were highly damaging to guinea pig skin, following intracutaneous injection.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Exposition of rats; 7 h/d; 8 days, to 50 mg/m3 of a specified unirradiated terphenyl mixture, resulted in transient morphological changes in mitochondria of pulmonary cells (number of vacuolated mitochondria increased with increasing days of exposure).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) oral??? = > 1900; > 2400 and > 10,000 mg/kg for ortho; meta and para-terphenyl respectively.

SHORT TERM TOX: In a 30 days study: rats fed 250 and 500 mg/kg/day of ortho-terphenyl showed elevated liver and kidney weight ratios; meta-terphenyls had only elevated kidney weight ratios. No effects on these organ weight ratios, nor on histopathological findings were seen when fed para-terphenyls. Unirradiated terphenyls are potential nephrotoxic. Hepatic damage occurs in rats fed 33 mg/kg/day or more of the high boiling fraction of terphenyl mixtures. (Duration of the test is not given).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): In moist skin, the terphenyls act as primary skin irritants. Concentrations above 10 mg/m3 were associated with eye and respiratory irritation in exposed workers.

SENSITIZATION (SK/RESP): No sensitization was reported from a long term clinical survey in workers who were exposed to ranges of 0.89 to 0.094 mg/m3 (minimum 6 months, maximum 7 years).

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: No recognizable harm was reported from a clinical survey of 47 persons who were exposed to ranges of 0.89 to 0.094 mg/m3 of a specified unirradiated terphenyl mixture. There is no evidence that the use of terphenyl coolants is associated with the development of skin tumors.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the transient effects on the mitochondria of rat lung cells, when exposed at 50 mg/m3. A Ceiling of 0.5 mg/m3 should protect against these possible mitochondrial changes.

Casnr: 79-27-6 Stofnaam: Tetrabroomethaan (1,1,2,2-)
Synoniemen:

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	1	14			Ned:		
USA	1992:					USA:		
UK	1992:	0.5	7			UK: Ja		UK:
BRD	1992:	1	14	2	28	BRD:		BRD:
Den	1992:	1	14			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 0.13 °C

BOILING POINT: 239 - 242 °C (breaks down)

VAPOR PRESSURE: 0.075 mm Hg (at 20 °C) (another vapor pressure than in the criteria document, according to some German technological data sheet-book)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The solution is irritant to the skin of rabbits.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Guinea pigs died after 1.5 hours exposure to saturated air (= 1543 mg/m3), whereas rats and rabbits survived respectively 3 and 2.5 hours exposure.

SHORT TERM TOX: Exposure to estimated concentrations of 17 ppm (15 min./day, 47 to 92 days) resulted in slight irritation of the respiratory tract. Six different animal species who were exposed to 4 ppm (7 h/d; 5 d/w; 180 to 184 days) showed fatty degeneration in the liver and edema and hemorrhages in the lungs. NEL was 1.1 ppm. Rats exposed to 0.7 ppm (4 h/d; 4 months) showed enzymatic changes in liver, brain and kidney. At 7 ppm, also bronchial irritation was found.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: Dermal application of 15 mg tetrabromoethane 3 times a week, for lifetime, caused a higher incidence of stomach papillomas in mice. A single application of 45 mg dissolved in 0.2 ml acetone was negative in an initiation-promotion test with mice.

4:MUTAGENICITY: The compound was negative in Ames tests and positive in an E. coli test

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Exposure of six persons to 1 to 2 ppm with a 10-min. peak of 16 ppm for 7.5 hours resulted in headache and slight irritation of the eyes and nose. One person also developed heartburn and pains in the stomach which lasted a few days and was followed by an extremely severe liver inflammation.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: "It is difficult to assess the relevance of the enzymatic and histopathological changes in inner organs. Critical effect is probably irritation of mucous membranes"

Casnr: 558-13-4 Stofnaam: Tetrabroomkoolstof
Synoniemen: Carbontetrabromide

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,1	1,4			Ned:		
USA	1992:	0.1	1.4	0.3	4.1	USA:		
UK	1992:	0.1	1.4	0.3	4	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,1	1,4			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 90.1 °C
BOILING POINT: 189.5 °C
VAPOR PRESSURE: 40 mm Hg (at 96.3 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The material is a potent lachrymator even at low levels.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposures to high concentrations cause upper respiratory irritation and injury to the lungs, liver and kidneys.

SHORT TERM TOX: NEL (rat) = 0.1- 0.5 ppm, depending on the used vapor determination technique. (exposure 7 h/d; 5 d/w; six months)

LONG TERM TOX: Chronic exposure effects (only 6 months???) at very low levels will be almost entirely limited to liver injury.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Lethal dose = 1-3 g/kg (rat). LD50 (mouse) sc. = 298 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on not published work and on a suggestion of Torkelson and Rowe (Torkelson was a chairman of the TLV cie.)

Casnr: 1335-88-2 Stofnaam: Tetrachloornaftaleen
Synoniemen: Halowax

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2			Ned: Ja		
USA	1992:	-	2			USA:		
UK	1992:	-	2	-	4	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	2			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 115 °C

BOILING POINT: 311.5 to 360 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Mixtures of tri- and tetrachloronaphtalenes are less toxic to the liver than more highly chlorinated derivatives.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Mixtures of tri- and tetrachloronaphtalenes are less toxic to the liver than more highly chlorinated derivatives.

Experiments with cattle have indicated tetrachloronaphtalene to be more toxic than trichloronaphtalene, but not more than one-sixth as toxic as the pentachloro derivative.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent liver injury and minimize skin effects.

Casn: 78-00-2 Stofnaam: Tetraethyllood
Synoniemen: Lead-, Bleitetraethyl

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned: Ja		
USA	1992:	-	0.1			USA: Ja		
UK	1992:	-	0.1			UK:		UK:
BRD	1992:	0,01	0,075	0,02	0,15	BRD: Ja		BRD:
Den	1992:	0,007	0,05			Den: Ja		
Zwed	1990:	-	0,05	-	0,2	Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -136 °C

BOILING POINT: 200 °C (decomposes)

VAPOR PRESSURE: 0.2 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Uptake via skin and lungs is fast (DFG, HSE). Seven days after an iv injection of TEL in rats, only triethyllead is detected in the inner organs, especially in the brains, liver, kidneys and muscles. Accumulation can occur of both triethyllead (in the inner organs) and inorganic lead (in the bones) (DFG).

BIOTRANSFORMATION: In the liver, TEL is rapidly transformed into triethyllead and inorganic lead of which the former is responsible for the acute toxic effects.

ELIMINATION: Triethyllead is only slowly excreted in the urine. There is a linear relationship between the concentration organic-lead in the occupational air and the concentration lead in the urine (DFG, ACGIH).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rats; one hour) = 545 mg/m3 (as Pb) (DFG, ACGIH).

SHORT TERM TOX: 14 Exposures of 14 mg/m3 (7 h/d) killed nine of ten rats; 150 exposures to 7.7 mg/m3 (as Pb) was not lethal for rats, but was lethal for two exposed dogs after 29 exposures.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 12.3 to 35 mg/kg (DFG, ACGIH).

SHORT TERM TOX: Daily administration of 0.0017 mg/kg bw (5 d/w; 21 weeks) caused serious changes in the CNS and liver in rats.

LONG TERM TOX:

CARCINOGENICITY: "Inadequate evidence" (HSE).

REPRODUCTION TOX: "Likely to be toxic to reproduction in the same way as other lead compounds" (HSE).

OTHER STUDIES: LD50 respectively iv and ip in rats and sc in mice = 14.4- 15.4; 15 and 13 mg/kg (DFG, ACGIH).

3.4:DERMAL: LD50 (rabbits) = 0.95 mg/kg (DFG, ACGIH). Lethal dose (when TEL is allowed to evaporate) = 0.7 mg/kg (ACGIH).

4:MUTAGENICITY: "It was found not to be mutagenic" (HSE).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Signs of intoxication include restlessness, sleeping disorders, vertigo, vomiting, anorexia, and in more serious intoxications hearing-, speaking- and vision disorders, cramps, delirium and coma. Some fatal intoxications are reported. Survivors recover completely within 4 to 10 weeks (DFG). One hour exposure to 100 mg/m3 (as Pb) may produce illness (ACGIH).

SHORT TERM TOX:

LONG TERM TOX: Some chronic intoxications are reported in Germany (DFG). "Potentially elevated exposures may be expected in inspection and maintenance activity in production, and in cleaning confined spaces which have contained leaded gasoline" (HSE).

EPIDEMIOLOGICAL STUDIES: Occupational exposure to 0.12 mg organic lead/m3 in a TEL manufacturing plant did not significantly increase the Pb-urine concentration (DFG, ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Although, according to the human data, concentrations of 0.1 mg organic lead/m³ are considered harmless provided skin uptake is avoided, MAK is maintained at 0.075 mgm³.

HSE: Critical effects are on blood synthesis, nervous system changes and kidney and liver damage. The "lead-in-air standard" is set in conjunction with a urinary lead standard, due to the high potential for skin absorption.

ACGIH: TLV should protect against excessive exposure, provided skin contact is avoided. Monitoring of the urinary Pb output is recommended for greater assurance of providing individual protection.

Casnr: 75-74-1 Stofnaam: Tetramethyllood
Synoniemen: TML

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: -		0,15			Ned: Ja		
USA	1992: -		0.15			USA: Ja		
UK	1992: -		0.15			UK:		UK:
BRD	1992: 0,01	0,075	0,02	0,15		BRD: Ja		BRD:
Den	1992: 0,007	0,05				Den: Ja		
Zwed	1990: -	0,05	-	0,2		Zwed: Ja		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -27.5 °C

BOILING POINT: 110 °C

VAPOR PRESSURE: 22.5 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: TML is absorbed through gastrointestinal tract and skin, and to a lesser extent via the lungs (DFG).

BIOTRANSFORMATION: In the liver TML is transformed into trimethyllead and anorganic lead, of which the former compound is responsible for the (acute) toxic effects (DFG).

ELIMINATION: There is a linear relationship between the concentration organic-lead in the occupational air and the concentration lead in the urine (DFG, ACGIH).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (60 min) for rats > 7000 mg/m3 (as Pb). The only toxic signs from exposure to 8870 mg/m3 (= 6900 mg/m3 as Pb) were slight hyperexcitability (DFG) although according to ACGIH this was the LC50 for rats (30 min; ten days observation). LC50 (mice; 30 min, with ten days observation)= 6600 mg/m3 (as Pb) (ACGIH).

SHORT TERM TOX: Exposure to 17 mg/m3 (as Pb) (7 h/d; 35 days) killed 8 of 10 rats. At 9.3 mg/m3 (as Pb) (7 h/d; 150 days) four animals of ten died, but this might have been due to some interfering infection. Two of six beagles, exposed to 3 mg/m3 (as Pb) (7 h/d), died within 107 days. Symptoms were tremor, excitation followed by convulsions and coma (DFG). This shows a rather big interspecies sensibility (ACGIH; DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats) = 80 - 105 mg/kg. Surviving animals showed lethargy, sleepiness and coma. TML has a destructive effect on neurones.

SHORT TERM TOX: Daily administration of 1.08 mg/kg bw (5 d/w; 21 weeks) (= omgerekend 4 mg/m3, as Pb) showed an increase in excitability and hypersusceptibility in rats. There were extensive changes in CNS and liver.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 iv and ip (rats)= respectively 88 and 80 mg/kg.

Iv administration of 34 and 40 mg/kg to rats and rabbits respectively did not induce any clinical toxic symptoms.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Occupational exposure to concentrations of circa 0.08 mg/m3 did not increase the lead concentration in the urine. When exposed to 0.15 mg/3 organic lead, the lead-urine concentration increased to 0.1 mg/l, which is lower than concentrations (exceeding 0.15 - 0.2 mg/l) reached when workers have probably absorbed a quantity lead which may produce health risk (DFG). Concentrations of 0.18 mg/m3 in a TML manufacturing plant did not increase Pb

concentration in urine significantly above a high normal (DFG, ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Exposure to 0.08 mg/m³ does not increase the "normal" daily intake of organic lead. The MAK-Wert supplies enough security, provided that there is no skin uptake.

ACGIH: TLV should protect against excessive exposure, provided skin contact is avoided. Monitoring of the urinary Pb output is recommended for greater assurance of providing individual protection.

Casnr: 3333-52-6 Stofnaam: Tetramethylsuccinonitril
Synoniemen: TMSN

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,5	3			Ned: Ja	Nee	
USA	1992:	0.5	2.8			USA: Ja		
UK	1992:	0.5	3	2	9	UK: Ja		UK:
BRD	1992:	0,5	3	1	6	BRD: Ja		BRD:
Den	1992:	0,5	3			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 170.5 °C
BOILING POINT: sublimes

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS: It is a strong convulsant.

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): Exposure at 60 ppm for two to three hours, and at 22 ppm for 3,5 hours or 28 ppm for 3 hours was lethal to rats and mice respectively.
SHORT TERM TOX: Exposure at 6 ppm for 30 hours was lethal to rats. A cumulative effect was not noted.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: Ingestion of 25 mg/kg was lethal to rats.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN: It is a strong convulsant.
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX: Workers in vinyl foam plants performed headaches, nausea, convulsions and coma. TMSN is one of the released compounds in this process.
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is suggested in order to prevent systemic effects manifested in workers chiefly as headache, nausea and convulsions.

Casnr: 137-26-8 Stofnaam: Tetramethylthiuramdisulfide
Synoniemen: TMTD, Thiram

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	5	-	10	BRD:		BRD:
Den	1992:	-	2			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 155 - 156 °C

BOILING POINT: decomposes

VAPOR PRESSURE: ~ 0 mm Hg (at 20 °C)

2:TOXICOKINETICS: Thiram increases the uptake of various heavy metals by the brain and other tissues. It inhibits several different enzyme systems resulting in inhibition of their own metabolism and that of alcohol and other compounds (SCG, ACGIH, DFG).

UPTAKE AND DISTRIBUTION: Absorption from the lungs is moderate; from the digestive tract good (DFG). It is distributed in all organs (ACGIH), with the highest concentrations in brain and muscles (DFG).

BIOTRANSFORMATION: Thiram is biotransformed to dimethyl dithiocarbamate and carbon disulfide in vitro and in vivo studies with rats (SCG, DFG).

ELIMINATION: After an oral dose of 200 mg/kg, rats exhaled 0.5% as carbon disulfide (SCG). Thiram is mainly excreted unchanged in the urine and faeces (ACGIH, DFG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): It irritates the skin and eyes of rabbits slightly (SITIZATION: (SK/RESP): Thiram causes skin sensitization in guinea pigs and rabbits (ACGIH, DFG).

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Four-hour exposure to a dust cloud containing 6225 mg/m3 was not lethal for rats, cats and rabbits (ACGIH).

SHORT TERM TOX: Exposure to 1.27 mg/m3 (continuously for 30 days) or to 1.9 mg/m3 (7 h/d; 5 d/w; 5 weeks) resulted in degeneration of the liver and kidneys and irritation of the lungs (ACGIH, DFG).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Exposure to 0.45 or 3.8 mg/m3 (6 h/d; 5 d/w; 4.5 months) caused reprotoxic effects (decreased reproduction and prolonged estrus cycle) in rats (DFG).

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Single dose of 120 mg/kg caused liver damage in rats (SCG). LD50 in rats vary from 400 to 4000 mg/kg; for mice from 210 to 4000 mg/kg; for rabbits from 210 to 1200 mg/kg (ACGIH). Toxic signs develop slowly and include on the second day after exposure a rumpled fur, rapid breathing, ataxia, tremor and dyspnea, and by death (ACGIH).

SHORT TERM TOX: NEL in a 29 days study with male rats was 11.25 mg/kg (ACGIH); in another study feeding 0.075 mg/kg for 30 or 45 days showed already neurologic symptoms and weight loss in rats (DFG). After four days 10 - 30 mg/kg rats showed axonal swelling in the ischias nerve (SCG). EL in a 13 weeks test with male rats was 25 mg/kg; effect was reduced body weight gain and food consumption (ACGIH) according to DFG, the effect at this level was convulsions and death; at 10 mg/kg (8 months) reduced body weight gain was not seen (pathology???) (ACGIH).

LONG TERM TOX: Rats, given 15 mg/kg/day (65 weeks) developed weakness, ataxia and paralysis, and histological changes in the brain (calcification) and muscles (dystrophia). NEL was 5 mg/kg, but in another study with rats (12 months), neurological effects and elevated liver and kidney weights were seen at 3 mg/kg (ACGIH). In another study (two years) a small reduction in growth rate of rats was seen at 5 mg/kg (ACGIH) mg/m3). NEL in dogs (one year study) was > 7 mg/kg (ACGIH).

CARCINOGENICITY: Daily 52 (males) or 67 (females) mg/kg (80 weeks) increased the incidence of thyroid metaplasia in rats (SCG, ACGIH); respectively 20 and 26 mg/kg did not show this effect (ACGIH).

Carcinogenicity studies in mice (week 2 to 4 10 mg/kg; followed by 26 ppm until they were 78 weeks of age; and 300 ppm for 104 weeks) and rats (500 ppm for 104 weeks) were negative. Sc injection of 46.4 mg/kg bw did not induce a higher incidence of tumors (ACGIH).

REPRODUCTION TOX: Daily doses of 132 and 96 mg/kg (13 weeks) induced

respectively degenerative changes in the epididymis and reduced fertility in male rats (SCG, ACGIH) and delayed estrus in female mice. Doses higher than 40 mg/kg/day in mice during gestation reduced fetal weight; 250 (SCG) or 125 (DFG) mg/kg/day was teratogenic in hamsters. Ip single doses of 30 to 100 mg/kg induced abnormalities in sperm of mice (SCG). A three generation test with 48 ppm (= 2.5 mg/kg for younger ones) rats did not reveal any effects on reproduction. Lowest reported NOELs in teratogenic studies were 179 mg/kg in mice; 90 mg/kg in rats and 125 mg/kg in hamsters, but lower doses did produce embryotoxicity and fetotoxicity. The overall NOEL seems to be 5 mg/kg (ACGIH). Sheep fed 20 mg/kg for 65 days, showed fetotoxic and embryotoxic effects (DFG).

OTHER STUDIES:

3.4:DERMAL: Application of 2000 mg/kg did not induce clinical toxicity in rats (ACGIH).

4: MUTAGENICITY: Several Ames tests were positive, with and without S-9 mix. Thiram induced chromosomal aberrations in rats at 80 to 320 mg/kg (SCG) and mice (100 mg/kg) but not in hamsters (in vitro?) (ACGIH); frame shift and base-pair mutations and a positive micronucleus test in mice at 100 mg/kg (SCG). ACGIH however reports also various conflicting or negative results in mutagenicity studies.

5: OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Thiram is irritating the skin (DFG).

SENSITIZATION (SK/RESP): Contansitization after oral exposure have been reported (SCG, DFG).

ACUTE TOX: One report stated that clinical symptoms occurred only at concentrations higher than 1 mg/m³ (ACGIH). Single oral intake of 375 mg did not reveal any symptoms in adults (DFG).

SHORT TERM TOX: Workers exposed to 0.028 - 0.4 mg/m³ for 7 days showed lower blood pressure, eosinopenia, lymphopenia and neutropenia (DFG).

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: In various studies dealing with complaints of workers, Antabus reactions from alcohol consumption may be involved (ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is its effect on sperm. Thiram is mutagenic, teratogenic, embryotoxic and sensitizing.

DFG: Toxic effects are found at exposures to concentrations below the MAK. Certainty whether the MAK provides enough safety can only be established after gathering field data or long term inhalation studies with animals.

ACGIH: Based on the assumption that indeed manifestation of clinical concentrations higher than 1 mg/m³; that other effects (reprotoxic) only develop at maternally toxic doses and that thiram has a low acute and chronic toxicity (and no carcinogenicity), TLV is lowered to 1 mg/m³ in 1987.

Casnr: 509-14-8 Stofnaam: Tetranitromethaan
Synoniemen: TNM

	tg	Mg/m3	STEL	Mg/m3	Huidno- tatie	Carcino- geen Nee	Sensibili- serend
Ned 1994:	1	8			Ned:		
USA 1992:	1	8			USA:		
UK 1992:					UK:		UK:
BRD 1992:	-	-	-	-	BRD:	IIIA2	BRD:
Den 1992:	1	8			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 14.2 °C

BOILING POINT: 126 °C

VAPOR PRESSURE: 8.4 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: In vitro the compound binds with cytochrome P-450 of phenobarbital-induced rat liver microsomes (but not to pig liver microsomes) (SCG). Probably trinitromethane will be one of the metabolites. TNM nitrates the tyrosine and cysteine parts of proteins. Oxidative dealkylation and nitrosation of tertiary amines by TNM, results in production of nitrosamines (DFG).

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): TNM is primarily irritating for the upper respiratory tract (DFG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): 10 ppm for 20 min. (DFG: 7-25 ppm for 5 hours) was lethal for cats (SCG, ACGIH). LC50 (mice, rats) (4 hour) = respectively 54 and 18 ppm. Toxic signs included labored breathing, lacrimation, salivation and cyanosis. The lungs were hemorrhagic, the digestive tract was hyperemic (DFG).
SHORT TERM TOX: Cats, exposed to 0.01 to 0.4 ppm for 1 to 3 days (DFG: 2 x 6 hours), showed slight irritation of the respiratory organs (SCG) (but according to DFG and ACGIH of the eyes); at 3 to 9 ppm they developed lung edema (SCG), methemoglobinemia and probably fatty degeneration of liver and kidneys (ACGIH). According to ACGIH, these exposures were usually fatal after a few hours exposure. Rats, exposed to 3.5; 5 or 7.5 ppm for two weeks, showed irritative and proliferative changes in the lungs, followed by pneumonia and structural lung changes. Exposure to 6.35 ppm (6 h/d; 5 d/w; 6 months) was lethal for 11 of 19 rats (DFG: showing lung edema and - hemorrhage), whereas two exposed dogs survived (SCG) after appearing unwell for two days (autopsy was negative) (ACGIH). Repeated exposure of the surviving rats showed habituation; reduced mortality (DFG). Mice and rats showed a dose dependent reduction in body weight after exposure to respectively 2 to 25 ppm and 10 ppm (but not at lower concentrations) (6 h/d; 5 d/w; 2 weeks). Mice exposed to 5 ppm (5 d/w; 13 weeks) showed inflammation and metaplasia of the mucous membranes of the upper respiratory tract; the males had an increased liver weight even at 0.2 ppm. For rats (same schedule) NEL = 5 ppm???? (not quite clear) (DFG).

LONG TERM TOX:

CARCINOGENICITY: Rats and mice exposed to respectively 0; 2; 5; and 0; 0.5; 2 ppm tetranitromethane (6 h/d; 5 d/w; two years) had a high frequency of lung tumors (adenomas and carcinomas) (the lung tissue contained activated oncogenes, activated by transformation of the DNA) (SCG, DFG).

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Intragastric LD50 (rats, mice) = respectively 130 and 375 mg/kg (DFG).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Iv LD50 (rats, mice) = resp. 12.6 and 63.1 mg/kg; ip LD50 (mice) = 53 mg/kg (DFG).

3.4:DERMAL:

4:MUTAGENICITY: In Ames tests and in E. coli, the compound was mutagenic (SCG) (S9-mix reduced the activity) by base pair substitution (DFG). Also SCE (DFG: without S9-mix) and chromosomal aberration tests were positive (SCG), although according to DFG the latter test was inconclusive/ not positive.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): It is a strong skin irritant and also irritates mucous membranes and respiratory organs (SCG). Normally skin contact should not be irritating (DFG).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Three workers who were exposed to tetranitromethane for over two weeks developed a severe lung edema, in one case fatal (SCG).

LONG TERM TOX: Prolonged exposure has been reported to cause headache, weariness, fatigue (SCG), methemoglobinemia (DFG) and should also affect the heart (ACGIH). Susceptibility of workers varies (DFG).

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect is irritation of the respiratory organs.

DFG: TMN has proved to be a strong genotoxic carcinogen in experimental animals, so no MAK can be established.

ACGIH: TLV should prevent irritation of the respiratory passages and other toxic effects. "This may not be low enough to prevent all irritation."

Casnr: 7440-28-0 Stofnaam: Thallium (in water oplosbaar)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:	Ja	
USA	1992:	-	0.1			USA:	Ja	
UK	1992:	-	0.1			UK:	Ja	
BRD	1992:	-	0,1	-	1	BRD:	Nee	UK:
Den	1992:	-	0,1			Den:	Ja	BRD:
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 303.5 °C

BOILING POINT: 1457 °C

2:TOXICOKINETICS: Thallium is one of the more toxic elements.

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LD50 for several animal species ranged from 3 to 92 mg/kg. Intoxication shows symptoms of the digestive tract or nervous system.

SHORT TERM TOX: The most characteristic symptom of intoxication is loss of hair.

LONG TERM TOX: Incoordination,, paralysis of extremities, endocrine disorders and psychoses may develop.

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 for several animal species ranged from 3 to 92 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Hundreds of cases of thallotoxicosis due to ingestion of pesticides have been reported. Recovered patients could still perform neurological abnormalities with mental retardation and psychoses.

SHORT TERM TOX: Workers who woked with organic thallium salts complained of abdominal pain, fatigue, irritability, weight loss, pain in the legs and loss of hair. One of the worst cases had a urinary thallium concentration of about 1 mg/l. No thallium in the air could be measured, so skin absorption was postulated

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based largely on analogy with other highly toxic heavy metals. One author considered this a satisfactory value to protect against systemic toxicity.

Casnr: 96-69-5 Stofnaam: Thiobis(6-tert-butyl-m-cresol) (4,4'-)
 Synoniemen: 6,6'-Di-tert-butyl-4,4'-thiodi-m-cresol

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:		10			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 164 °C

VAPOR PRESSURE: 0.00000063 mm Hg (at 70 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Approximate lethal dose in rats was 5 g/kg. Gastroenteritis was the chief symptom.

SHORT TERM TOX: In a 30 days-study with rats, NEL was 500 ppm (= omgerekend 115 mg/m3); 2500 ppm showed retarded weight gain and enlarged livers. In a 90 days-study with rats NEL was 50 ppm (= omgerekend 11.5 mg/m3). At 500 ppm there was a retarded weight gain, but no pathologic changes were found.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: In absence of toxicologic data, TLV of nuisance dust is recommended.

Casnr: 7719-09-7 Stofnaam: Thionylchloride
Synoniemen:

	tg	STEL	Huidno-	Carcino-	Sensibili-
	ppm	Mg/m3	tatie	geen	serend
Ned 1994: 1C	5C		Ned:		
USA 1992: 1C	4.9C		USA:		
UK 1992: -	-	1	UK:		UK:
BRD 1992:		5	BRD:		BRD:
Den 1992: 1C	5C		Den:		
Zwed 1990:			Zwed:		Zwed:

A review of the toxicity of thionyl chloride has been prepared by Gould, Inc. (copies available from the ACGIH office)

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -104 °C

BOILING POINT: 76 °C

VAPOR PRESSURE: 100 mm Hg (at 21 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): A concentration of 17.5 ppm was lethal to cats in 20 minutes.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Vapors of thionyl chloride are recognized as highly irritating to skin, eyes and mucous membranes. This is probably due to the formation of SO₂ and HCl.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: One mole thionyl chloride produces two moles HCl and one mole SO₂; 1ppm produces a total irritant gas concentration of 3 ppm. Since the TLV for HCl = 5 ppm Ceiling; and TLV for SO₂ = 2 ppm, a TLV of 1 ppm should prevent the irritant effects of its reaction products.

Casnr: 18282-10-5 Stofnaam: Tinoxide
Synoniemen:

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	2			Ned:		
USA	1992:	-	2			USA:		
UK	1992:	-	2	-	4	UK:		UK:
BRD	1992:	-	2	-	4	BRD:		BRD:
Den	1992:	-	2			Den:		
Zwed	1990:					Zwed:		Zwed:

The documentation includes Tin as Metal, Tin oxide and Inorganic Compounds, except SnH4.

A review of the industrial hygiene and toxicology of tin may be found in Patty's. (No data used from this reference)

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: (animal-study or human information??) Tin salts when they have reached the bloodstream, are highly toxic, producing paralysis and other neurologic damage. After being hydrolysed in the body fluids, they also cause unphysiologic pH changes which may add to the reported hyperemia, vascular changes and bleeding in the central nervous system, the liver and other organs. The resulting vomiting after oral intake is probably due to gastric irritation from the activity and astringency of the compound or its associated anions.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip injection of tin dust resulted in a non-specific, well-vascularized chronic granulomatous reaction in guinea pigs.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: (For symptoms: see acute tox. oral, animal experiments) Acute lethal dose (iv) of the citric salt of tin = 100 mg as Sn/ kg body weight. A dosage of 25 mg results in tremors and 50-60 mg in flaccid paralysis. The liver and spleen are most severely affected.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: More than 150 cases of benign pneumoconiosis resulting from exposure to dust and fume of tin (oxide) are reported. The fume is considered to do more harm than the dust. Also the duration of exposure is of importance. No cases of massive fibrosis have been seen from overexposure to tin.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is supposed to prevent stannosis.

Casnr: x Stofnaam: Tinverbindingen (organisch)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned: Ja	Nee	
USA	1992:	-	0.1	-	0.2	USA: Ja		
UK	1992:	-	0.1	-	0.2	UK: Ja		UK:
BRD	1992:	-	0,1*	-	0,2	BRD: Ja		BRD:
Den	1992:	-	0,1			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

The organotin compounds vary widely in their toxic reactions and effects, which makes the establishment of an overall TLV a difficult matter.

1:PHYSIOCHEMICAL PROPERTIES:

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Skin penetration occurs.

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: 1 ppm triphenyltin in the diet inhibited growth of guinea pigs. bis(tri-n-butyl-tin)oxide is a moderately toxic compound in acute and sub-acute tests with rats, rabbits and guinea pigs. This substance compound is one of the less toxic members of the alkyltin compounds from the standpoint of mammalian toxicity. Some of the -butyltin compound have hemolytic action.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip LD50 of triphenyltin = 4 and 8 mg/kg.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): "The substance" is a primary skin irritant; skin lesions are relatively common in men handling tributyltin compounds. Sore throat, cough and retching were sometimes noted after exposure. Exposure at 0.1 mg bis(tri-n-butyltin)oxide/m3 caused eye and respiratory tract irritation.

SENSITIZATION (SK/RESP): "The substance" can induce sensitization.

ACUTE TOX: Numerous fatal cases of ingestion of diethyltin diiodide (used in treatment of furunculosis) are described.

SHORT TERM TOX: No evidence of systemic poisoning was noted in men handling tributyltin compounds.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should minimize irritation and prevent effects on the circulatory and central nervous system. New data supplied by a major manufacturer of organic tin compounds supports the need for control of excursions to 0.2 mg/m3 to prevent acute symptoms.

Casnr: 13463-67-7 Stofnaam: Titaandioxide
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:	-	6			BRD:		BRD:
Den	1992:	-	6			Den:		
Zwed	1990:	-	5			Zwed:		Zwed:

It occurs in three forms: anatase; brookite and rutile

1:PHYSICOCHEMICAL PROPERTIES:

MELTING POINT: 1800 - 1850 °C

BOILING POINT: 2500 - 3000 °C

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION: It is considered relatively inert (SCG, DFG, ACGIH).

ELIMINATION: Clearance from the lungs in rats has a half time of about 25 days (after a 7-hour exposure to 15 mg/m3) (SCG).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX: Exposure of rats to a concentration range of 0 - 250 mg/m3 (6 h/d; 5 d/w; two years) showed a dose dependent increase of dust deposits in liver, spleen, and lymphatic glands, without tissue reactions, although there were dose dependent macrophage reactions (at 50 mg/m3: cellular degeneration and granuloma formation which were more pronounced at 250 mg/m3) and tendencies to fibration (SCG).

CARCINOGENICITY: Exposure of rats to 250 mg/m3 (6 h/d; 5 d/w; towed 16.5% bronchoalveolar adenomas and 9% epithelial carcinomas (SCG, DFG).

REPRODUCTION TOX:

OTHER STUDIES: Intrapleural, ip and intratracheal application of the compound did not reveal any fibrotic changes in rats or guinea pigs (DFG, SCG) or only transient effects in rabbits (SCG, ACGIH).

3.3:ORAL:

ACUTE TOX: LD0 (rats) > 20 g/kg

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY: Feeding 2.5 or 5% titanium dioxide to mice and rats (two years) did not reveal any carcinogenic effects (SCG, DFG, ACGIH).

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY: Several bacterial studies were negative (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: Irritation of the respiratory tract is reported in workers, but there were always mixed exposures (SCG). In various reports no indication of fibrotic changes could be found in the lungs of workers (DFG).

EPIDEMIOLOGICAL STUDIES: Workers exposed to 0 showed reduced ventilation capacity and thickened pleura; one worker after regular exposures above 10 mg/m3 in a four year working period, showed a massive deposition of white pigment in the lungs without inflammatory or fibrotic changes (SCG). Incomplete studies showed a higher cancer incidence in workers exposed to titanium dioxide (SCG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: Critical effect seems to be on the respiratory tract, whether or not as a general effect from "dust" or by the titanium dioxide itself.

DFG: MAK for respirable dust is given.

ACGIH: There has been no evidence of danger to health from exposures $\leq$ 10 mg/m³. In 1984 the TLV for respirable dust was deleted.

Casnr: 108-44-1 Stofnaam: Toluidine (m-)
Synoniemen: 3-Methylaniline; 3-Aminotolueen; 1-Amino-3-methylbenzeen

	tg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	2	9	Ned: Ja	Nee	
USA 1992:	2	8.8	USA: Ja		
UK 1992:			UK:		UK:
BRD 1992:			BRD:		BRD:
Den 1992:	2	9	Den: Ja		
Zwed 1990:			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

SOLIDIFIES: ~ -50 °C
BOILING POINT: 203 °C
VAPOR PRESSURE: 1 mm Hg (at 41 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: The compound is absorbed via the respiratory tract and skin.

BIOTRANSFORMATION: After oral application of 500 mg/kg body weight in corn oil only 2.5 % was excreted unchanged. The major urinary metabolite was 2-amino-4-methylphenol.

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): m-Toluidine has a moderate and strong irritating effect on respectively the skin and eyes of rabbits.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 974 mg/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY: 25 Male rats were fed 8000 ppm for 3 months and then 4000 ppm for an additional 15 months. No significant increases of tumor incidences were found. Groups of 25 male and 25 female mice, were fed m-toluidine HCl at levels of 16,000 ppm for 5 months, followed by 4000 ppm in males and 8000 ppm in females for 13 months; or 32,000 ppm for 5 months, followed by 8000 ppm in males and 16,000 ppm in females for 13 months. Animals were observed for 21 months. Significant increase in liver tumors occurred in male mice fed the low dose (4000 ppm = omgerekend 1400 mg/m3).

REPRODUCTION TOX: There are no data available on reproduction and prenatal toxicity. Oral application of 200 mg/kg did not inhibit the testicular DNA synthesis in male mice.

OTHER STUDIES: A single iv injection of 27 mg/kg of the compound produced a mean maximal methemoglobinemia of 60.2% in cats.

3.4:DERMAL:

4:MUTAGENICITY: With or without S9-mix, Ames-tests and E. coli tests with various S.- and E. strains, were all negative. A recombination assay with Bacillus subtilis was negative. DNA-synthesis of rat hepatocytes was not influenced by m-toluidine.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Clinical signs include methemoglobinemia and hematuria. Severe intoxication follows exposure of 40 ppm in the air for 60 minutes.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: There are no epidemiologic studies reported.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is the same as that of o-toluidine, which compound is more intensively tested. m-Toluidine shows the same toxicity profile and the dose range producing toxic effects is comparable. Unlike o- and p-toluidine, m-toluidine seems to have no carcinogenic and mutagenic activity.

Casnr: 106-49-0 Stofnaam: Toluidine (p-)
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	2	9			Ned: Ja		
USA	1992:	2	8.8			USA: Ja	A2	
UK	1992:					UK:		UK:
BRD	1992:	-	-	-	-	BRD: Ja	IIIB	BRD:
Den	1992:	2	9			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 44.5 °C
BOILING POINT: 200.4 °C
VAPOR PRESSURE: mm Hg (at 20 °C)

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION: It is absorbed via the skin, respiratory tract and mucous membranes (DFG, ACGIH).
BIOTRANSFORMATION: The major metabolite in rats is 2-amino-5-methylphenol (DFG, ACGIH). In humans, N-oxidation of the amino-group occurs, resulting in p-N-hydroxylaminotoluene. This metabolite is responsible for the formation of hemoglobin adducts (DFG).
ELIMINATION: Male rats, given 500 mg/kg orally, excreted 2.5% unchanged in the urine, within 24 hours (DFG, ACGIH).

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): p-Toluidin has moderate to strong irritating effect on skin and eyes of rabbits (DFG, ACGIH). Exposure to 640 mg/mg of air (???) was irritating to the eyes and nose of rats (ACGIH).
SENSITIZATION: (SK/RESP): A sensibilization test with guinea pigs was dose dependent positive (DFG, ACGIH).

3.2:INHALATION:
ACUTE TOX (LOC/SYST):

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (mice, rats) = respectively 330 - 794 and 656 - 760 mg/kg (DFG, ACGIH).
SHORT TERM TOX: NEL in male rats (only gross pathological research) (4 weeks test) = 165 ppm (= omgerekend 37 mg/m3); at 825 ppm the only (gross) effect was an increased relative liver weight (DFG, ACGIH).
LONG TERM TOX:
CARCINOGENICITY: Subcutaneous administration of p-toluidin (25 and 75 mg/kg; once weekly; 24 months) resulted in a higher incidence of malignant tumors at the site of injection and of benign liver tumors in the highest dose group. Also a higher incidence of liver cell necrosis was found in both groups. Oral studies with p-toluidin-HCl were performed (rats negative; mice positive) (DFG, ACGIH).
REPRODUCTION TOX:
OTHER STUDIES: Ip LD50 (mice) = 50 mg/kg; sc LD50 (female rats) = 1012 mg/kg. The compound influenced various liver enzyme activities in male rats after three daily ip administration of 75 mg/kg pG).
Single iv injection of 27 mg/kg induced 40% methemoglobinemia in cats (ACGIH).

3.4:DERMAL: LD50 (rabbits) = 890 mg/kg (DFG, ACGIH). Twice weekly application of 1 drop of a 20% solution in dioxane on the back of female mice, did not result in tumors (DFG, ACGIH).

4:MUTAGENICITY: Ames tests, several E. coli tests and a Saccharomyces test were negative, with or without metabolic activation (DFG, ACGIH); only one study revealed mutagenic activity (after metabolic activation) in an Ames test. In one Saccharomyces test, p-toluidin induced mitotic crossing-over. An unscheduled DNA-synthesis test in rat hepatocytes was positive. Two tests to investigate DNA-strand breaks, were negative although according to ACGIH one test (ip administration in mice) was positive. Oral application of 200 mg/kg in mice inhibited the testicular DNA synthesis (ACGIH).

5:OBSERVATIONS IN MAN: Most reported occupational exposure concerns mixtures of toluidin isomers (DFG).
IRRITATION (SK/MM/EY/RESP):

SACUTE TOX: Intoxication symptoms include anemia, stranguria, hemoglobinuria (DFG) and methemoglobinemia (ACGIH). Exposure of 60 minutes to 40 ppm produces severe intoxication (ACGIH).

SHORT TERM TOX:

LONG TERM TOX: In one 23 year old worker who had been exposed to p-toluidin for 1.66 year, bladder papillomas were found (DFG).

EPIDEMIOLOGICAL STUDIES: Not occupationally-exposed people have detectable concentrations of p-toluidin in their urine and blood; smokers higher concentrations than not smokers (DFG).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Metabolites have probably genotoxic carcinogenic potential. There are not yet enough data to classify the compound as carcinogenic, or to set a MAK-Wert.

ACGIH: Although p-toluidin seems to have weaker carcinogen and mutagen properties than o-toluidin, "it should be classified similar to o-toluidin".

Casnr: 8001-35-2 Stofnaam: Toxafeen
Synoniemen: gechloreerde camfeen 60%

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,5			Ned: Ja		
USA	1992:	-	0.5	-	1	USA: Ja		
UK	1992:					UK:		UK:
BRD	1992:	-	0,5	-	5	BRD: Ja		BRD:
Den	1992:					Den:	R40	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 65 to 90 °C

BOILING POINT: decomposes

VAPOR PRESSURE: between 0.2 and 0.4 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Accumulation of toxaphene or a chlorinated metabolite in the fatty tissue may occur, depending upon the dosage. When ingestion stops, it will rapidly disappear from body fat.

BIOTRANSFORMATION: Toxaphene is conjugated with sulfuric acid and glucuronic acid.

ELIMINATION: Toxaphene and meatabolites are excreted to some extent in the urine.

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 in various animal species is irregular: in rats = 60 to 90 mg/kg; in dogs = 10 to 25 mg/kg; for guinea pigs = 210 to 288 mg/kg.

SHORT TERM TOX: In a six-months study NEL was 800 ppm for guinea pigs and rats (= omgerekend voor ratten: 184 mg/m3). In monkeys, NEL was 10 ppm (=omgerekend 6,3 mg/m3), whereas 60 ppm produced toxic symptoms after the second week of feeding.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Acute lethal dose is 2 to 7 grams; 10 mg/kg may cause nonfatal convulsions. Toxic symptoms include nausea mental confusion, jerking of arms and legs, convulsions; general stimulation of the CNS. The endocrine glands are highly sensitive to this compound. Although people are widespread occupationally exposed at toxaphene (without special precautionary measures), not one case of occupational poisoning is reported.

SHORT TERM TOX: Men, who were exposed at 500 mg/m3, 30 minutes a day; 10 consecutive days, with repetition on three consecutive days after three weeks, did not show any toxic response in blood, urine or physical examination.

LONG TERM TOX: 137 employees who have been exposed at toxaphene for up to 18 years with an average of 3.7 years, did not show any adverse effects that could be associated with the exposure.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent significant accumulation and systemic effects.

Casnr: 126-73-8 Stofnaam: Tributylfosfaat
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	0.2	2.2			USA:		
UK	1992:	-	5	-	5	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,2	2,5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: < -80 °C

BOILING POINT: 289 °C (decomposes)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Sites of biological effects: neurotoxicity (paralysis, weak cholinesterase inhibition); CNS (anesthesia); skin and mucous membranes (irritation); lung (edema).

3.1:IRRITATION (SK/MM/EY/RESP): The liquid is very irritating to the skin and eyes of rabbits.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats, stomach tube) = 3 g/kg.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Ip injection of 1 g tributyl phosphate (in corn oil)/kg to albino mice, resulted in paralysis. Iv injection of 80 mg/kg to rats resulted in one hour light anesthesia; 100 mg/kg caused complete respiratory failure after 8-10 minutes anesthesia. Ip administration of 16 - 266 mg tributyl phosphate/kg caused 21% inhibition of cholinesterase in rats and stimulation of β -glucuronidase in plasma (20 times at 20 mg/kg and 50 times at 266 mg/kg). (16 mg/kg = omgerekend 73,6 mg/m3)

3.4:DERMAL:

4:MUTAGENICITY: No mutagenicity was found when tested in Ames test, E. coli and Drosophila.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX: Workers exposed at 15 mg/m3 experienced headache and nausea.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is the same as for triphenyl phosphate, because LD50 is about the same for both compounds.

Casnr: 93-76-5 Stofnaam: Trichloorfenoxiazijnzuur (2,4,5-)
 Synoniemen: 2,4,5-T

		tg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10			Ned:		
USA	1992:	-	10			USA:		
UK	1992:	-	10	-	20	UK:		UK:
BRD	1992:	-	10	-	20	BRD: Ja		BRD:
Den	1992:	-	5			Den: Ja		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 153 °C

BOILING POINT: decomposes.

VAPOR PRESSURE: ~ 0 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 = 300- 2000 mg/kg for rats, mice, guinea pigs and rabbits.
 SHORT TERM TOX: There were no deaths among dogs treated with 20 mg/kg daily during a 75 day period (= omgerekend 140 mg/m3). At higher doses some deaths occurred.

LONG TERM TOX: "Chronic exposure is not necessarily more hazardous."

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4;MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: There are no reports of illness from occupational exposure.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on extrapolation from animal feeding studies and extensive use experience.

Casnr: 1321-65-9 Stofnaam: Trichloornaftaleen
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5			USA:	Ja	
UK	1992:	-				UK:		UK:
BRD	1992:	-	5			BRD:	Ja	BRD:
Den	1992:	-	5			Den:	Ja	
Zwed	1990:	-				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 92.8 °C

BOILING POINT: 304.44 to 354.44 °C

VAPOR PRESSURE: < 0 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Rats, who were exposed at 11 mg/m3; 16 h/d; for a total of 1232 hours, produced slightly swollen and over-granular liver cells, with occasional mitotic figures. Exposures at 1.3 mg/m3 for 1896 hours resulted in very slight swelling of the liver.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX: Calves who received 16 and 26 mg/kg over periods of seven and ten days, showed no effects.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: No fatal casesr injury have been reported. One non-fatal case of toxic hepatitis is known in a plant with an air concentration of 3 mg/m3. Some cases of chloracne have been reported.

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is consistent with the TLV of the more toxic members of the series.

Casnr: 13121-70-5 Stofnaam: Tricyclohexyltinhydroxide
Synoniemen: Cyhexatin; Plictran (Deens)

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	5			Ned:		
USA 1992:	-	5			USA:		
UK 1992:	-	5	-	10	UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	-	5			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 195 to 198 °C
VAPOR PRESSURE: negligible at 25 °C.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rabbit) = 500; (guinea pig) = 700; (chicken) = 654; and (rat) = 190-700 mg/kg. Intraruminal doses of 150 mg/kg were lethal to sheep. At 50 mg/kg there were signs of moderate toxicity; at 25 mg(/kg?) mild toxicity and at 15 mg(/kg?) there were no observable effects.
SHORT TERM TOX: When fed 25 mg/kg by single dose gavage for two weeks, rats showed microscopic changes in liver, kidneys and adrenal glands.
LONG TERM TOX: NEL in rats in a two year study = 6 mg/kg/day (omgerekend 42 mg/m3) and in Beagles, = 3 mg/kg/day (omgerekend 21 mg/m3), based on body weight gain. At respectively 12 and 6 mg/kg there were no changes in behavior, rate of mortality, gross or microscopic appearance of tissues, and hematological or biochemical values. These rats and dogs were only smaller than controls.
CARCINOGENICITY:
REPRODUCTION TOX: There were no effects on fertility, gestation, viability or lactation in rats fed 4-6 mg/kg/day in a three generation test. In reproduction and teratology studies with rabbits, fed 3 mg/kg/day on the 8th through the 16th day of gestation, there was no evidence for teratogenic or reproductive effects.
OTHER STUDIES: LD50 ip (rat) = 13 mg/kg.

3.4:DERMAL: One of five sheep died of multiple applications of a 1% suspension. In yearling cattle and goats, applications in concentrations below 1% had no apparent effect, but concentrations of 1 to 2% caused mild effects, as did 0.5 % concentrations in sheep.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is compared to the NEL in dogs, and the idea is that the TLV is high enough. TLV for Cyhexatin, as Sn (about 1.5 mg/m3) is higher than the TLV for organic tin compounds in general. The Committee suggests that the TLV for organic tin compounds is based on the more toxic members of the group.

Casnr: 115-86-6 Stofnaam: Trifenyfosfaat
Synoniemen: TPP

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	3			Ned:		
USA	1992:	-	3			USA:		
UK	1992:	-	3	-	6	UK: Nee		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	3			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 50 °C
BOILING POINT: 245 °C (at 11 mm Hg)
VAPOR PRESSURE: < 0.0075 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: Skin - and gastro-intestinal absorption is slow (DFG, ACGIH).
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Six times repeated dermal application of TPP (4 hours exp.) did not irritate the skin (DFG, ACGIH). Ocular instillation of 0.1 g TPP in rabbits caused only light redness of the conjunctivae (DFG).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rats) > 200,000 mg/m3.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rats, mice, calculated) = resp. 3800 and 1320 mg/kg (DFG, ACGIH); intragastric LD50 (rats) = 10,800 mg/kg or > 20,000 mg/kg (DFG). One ppm in the water killed all of six goldfish within eight hours; histological findings were congestion, degeneration and hemorrhage from the smaller blood vessels, especially in liver, kidney and brain. These observations were similar to those found in rats and mice (ACGIH).
SHORT TERM TOX: Neurologic effects in some early studies must probably be contributed to the presence of impurities in the used test substances; repeated studies with cats and chickens (with high doses; cats: up to 1000 mg/kg sc; chickens in total 60 g/kg), did not reveal any neurotoxicity from TPP, although some specific in vitro-neurotoxic-testsystem had a positive result (DFG). Young rats, who received feed containing 5000 ppm TPP for 35 days, showed a reduced body weight gain, and an increased liver weight; at 1000 ppm (= omgerekend 460 mg/m3) there was no such effect (DFG, ACGIH). Rats, receiving feed with 10,000 ppm TPP for 120 days, did not show any changes in neuromotoric functions. From a comparable study (same exposures, same effects) the authors suspected an immunotoxic potential in TPP, although the results were not very convincing (increase in α - and β -globulines in resp. female and male rats) (DFG).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX: There were no reprotoxic properties detected from TPP in concentrations up to 10,000 ppm (which showed maternal toxicity) in rats (DFG).
OTHER STUDIES: Sc LD100 (monkeys, rabbits) = resp. 500 and 1000 mg/kg; no paralysis before dying (DFG, ACGIH).

3.4:DERMAL: LD50 (rabbits) > 10,000 mg/kg (DFG).

4:MUTAGENICITY: TPP has a dose dependent cytotoxic potential. Ames tests were negative with and without metabolic activation; a micronucleus test in SHE cells was weakly positive (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX: Estimated lethal dose is 1000 mg/kg (DFG).
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: No irritative nor neurologic effects could be detected in occupational workers, exposed to 3.5 mg/m3 TWA with regular exposition peaks

of (30-60 minutes-peaks) of 14 - 40 mg/m³ (mean exposure: 8.5 years). They did show a slight reduction in cholinesterase activity in erythrocytes, but not in the plasma. Until now, these results could not be confirmed (DFG, ACGIH).

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: There are not sufficient data to establish a MAK.

ACGIH: TLV is based on the human study.

Casnr: 121-45-9 Stofnaam: Trimethylfosfiet
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	2	10			Ned:		
USA	1992:	2	10			USA:		
UK	1992:	2	10			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	0,5	2,6			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -78 °C
BOILING POINT: 111 - 112 °C
VAPOR PRESSURE: 24 mm Hg (at 25 °C)
ODOR THRESHOLD: 0.0001 ppm

2:TOXICOKINETICS: Organophosphites have no anticholinesterase activity (ACGIH).

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Exposure to 51 ppm (6 h/d; 5 d/w; four weeks) resulted in corneal irritation in experimental animals. NEL was 10 ppm (DFG, ACGIH). Instillation in the eye of rabbits resulted in reversible severe eye irritation and swelling (DFG, ACGIH).
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (4-hours) in rats > 51,500 mg/m3, the animals showed signs of irritated eyes and respiratory tract (DFG).
SHORT TERM TOX: Exposure to 51 and 101 ppm (6 h/d; 5 d/w; 4 weeks) did not cause any changes in internal organs or body weight in rats. Mortality rate was 0% at these concentrations; at 300 ppm it was 10% (DFG, ACGIH). At 600 ppm (same exposure scheme) there were macroscopic signs of inflammation in the lungs (ACGIH).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 = 1600 - 2890; and 4300 mg/kg in rats and mice respectively (DFG, ACGIH).
SHORT TERM TOX: NEL in rats (90 days) = 80 mg/kg (stomach-tube fed). Higher doses caused ataxie, alopecia and decreased activity and body weight, with histological changes in lungs, liver (fatty degeneration), testes (reduced sperm production), kidneys and stomach (DFG).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX: Fetotoxic and teratotoxic NEL in rats (stomach tube; day 6 to 15 of gestation) = 49 mg/kg/day; 164 mg/kg showed various effects (DFG, ACGIH).
OTHER STUDIES: Ip LD50 (rats) = 2250 mg/kg (DFG).

3.4:DERMAL: Dermal application resulted in severe irritation; LD0 = 2200 mg/kg in rabbits and LD50 = 2600 or 7500 mg/kg (DFG, ACGIH).

4:MUTAGENICITY: Ames test and Saccharomyces test with or without S9-mix and E. coli DNA-Repair-test were negative. Mutagenic activity was found in mouse lymphoma cells (without S9-mix) and rat liver microsomes, and in Drosophila tests (DFG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Strong irritation of skin and eyes occurs after skin contact or exposure to the vapor; concentrations below 20 ppm were not considered annoying (DFG, ACGIH).
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX: Workers exposed to concentrations of 0.3 to 4 ppm, with peaks of 15 ppm did not reveal any ocular changes (DFG, ACGIH).
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

DFG: Critical effect are irritation of eyes and mucous membranes of the

respiratory tract. MAK-Wert can not be set because of too much lacking data on long term effects, carcinogenicity, reprotoxicity etc. DFG HAS ADDED A SKIN NOTATION!!!!

ACGIH: TLV is based on the human data concluding that the critical effect is irritation of the eyes, which does not occur at the TLV level.

Casnr: 88-89-1 Stofnaam: Trinitrofenol (2,4,6-)
Synoniemen: Picrinezuur

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:	Ja	
USA	1992:	-	0.1			USA:	Nee	
UK	1992:	-	0.1	-	0.3	UK:	Ja	UK:
BRD	1992:	-	0,1	-	0,2C	BRD:	Ja	BRD:
Den	1992:	-	0,1			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: 122-123 °C

BOILING POINT: explodes above 300 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Subcutaneous LD0 (rabbits and cats) = 120 and 100-125 mg/kg respectively. Sublethal dose in dogs (50 mg/kg or less) resulted in transitory changes in the kidney, including glomerulitis.

3.4:DERMAL:

4:MUTAGENICITY: Negative results were found in Ames test without S9-mix and in a mouse bone marrow micronucleus test. Picric acid induced lethal mutations in germ cells of Drosophila males after injection, but not after feeding (although one author claims to have found very weak mutagenic effects in male Drosophilas after feeding picric acid. The same author claimed weak mutagenic activity in Ames test with and without metabolic activity). An Ames test was positive after metabolic activation.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Picric acid dust or "fumes" caused irritation of the eyes. Accidental contact of a picric acid solution with the eyes caused corneal injury and "strange" visual effects.

SENSITIZATION (SK/RESP): Skin contact with the powder can cause sensitization dermatitis.

ACUTE TOX: Ingestion of 1-2 gram caused severe poisoning. Drinking water containing 2-20 mg/l picric acid, caused hematuria in consumers. Other systemic poisoning signs include headache, nausea, vertigo, vomiting, diarrhea, jaundice and (after a high dosis:) hemolysis, gastroenteritis, hemorrhagic nephritis and acute hepatitis.

SHORT TERM TOX:

LONG TERM TOX: In a plant where workers were exposed at 0.0088 to 0.1942 mg/m3 ammonium picrate, dermatitis only developed in the lower exposure groups; it was suggested that adaptation may occur following exposure.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is suggested to prevent systemic toxicity. It may not, however prevent development of dermatitis or sensitization in some workers.

Casnr: 479-45-8 Stofnaam: Trinitrofenylmethylnitramine (2,4,6-)
Synoniemen: Tetryl; N-Methyl-N 2,4,6-tetranitroaniline

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1,5			Ned:	Ja	
USA	1992:	-	1.5			USA:	Nee	
UK	1992:	-	1.5	-	3	UK:	Ja	UK:
BRD	1992:	-	1,5			BRD:	Ja	BRD: Ja
Den	1992:	-	1,5			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 129 °C
BOILING POINT: 187 °C (760 mm Hg) explodes
VAPOR PRESSURE: < 1 mm Hg (at 20 °C).

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Rabbits died of one to three doses of 1 g/kg per stomach tube. Post mortem findings were the same as in dogs given the compound sc, except for the liver changes, which were almost absent in the rabbits.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: The lowest lethal dose was five times daily 0.1 g/kg given subcutaneously to a dog. Gross examination showed a mild nephritis and a severe acute inflammation at the injection site, with various degrees of edema and hemorrhage, and sometimes degenerated muscle tissue. Also the livers showed necrosis, in varying degrees, in the centers of the lobules and a severe fatty degeneration of the liver cells and fat disposition in the bile duct epithelium. There were varying degrees of edema in lungs and bronchi with, in one case, thrombi in the pulmonary artery. The spleens showed blood pigments in moderate amounts, but no congestion. The largest non-fatal dose was 2.5 g/kg single sc injection.

3.4:DERMAL:

4:MUTAGENICITY: Mutagenic activity was seen in Ames tests, a Neurospora crassa ad-3 test and a yeast test, especially without S9-mix, but not in a DNA repair assay with E. coli, in concentrations as low as 5 ug/ml. In the first two positive assays, it caused base pair substitution revision and in the third, it caused mitotic gene conversion at 2 loci.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Tetryl is highly irritating to the skin and mucosal membranes and may cause severe upper respiratory tract irritation with coughing and epistaxis.
SENSITIZATION (SK/RESP): The tetryl dermatitis is believed to be a sensitization phenomenon, rather than a result of local irritation (see also epidemiology). Other cases of sensitization of the skin are described.
ACUTE TOX: Air borne exposures may cause liver damage. Accidental exposures (no concentrations given) resulted in death and yellow pigmentation of the skin, liver damage, dermatitis and dermal and respiratory irritation, in one case resulting in pulmonary pathologic changes. Also irritation of the mucous membranes of the upper respiratory tract was noteworthy, resulting in sore throats, nosebleeds and coughing of varying degrees of severity.
SHORT TERM TOX: Tetryl used in war, affected 10-15% of new workers from 1-2 weeks after they begin handling the material.
Airborne dust may cause conjunctivitis, usually accompanied by dermatitis of the

face.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES: Workers exposed to concentrations that did not exceed 1.5 mg/m³, showed no cases of systemic poisoning, but respiratory and gastrointestinal systems were noted as well as skin sensitization and a typical tetryl dermatitis, beginning around the eyes.

Exposures to tetryl particles of a size > 150 um did not result in X-ray evidence of lung damage.

Some investigators cited increasing evidence of systemic effects in exposed workers, such as anemia, headache, irritability, malaise, lassitude and sleeplessness.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV appears to be sufficiently low to prevent systemic poisoning, however it may not protect against skin and possible respiratory sensitization in all individuals.

Casnr: 78-30-8 Stofnaam: Triorthocresylfosfaat
 Synoniemen: Tri-o-tolyl phosphate; TOCP

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA: Ja		
UK	1992:	-	0.1	-	0.3	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -33 °C
 BOILING POINT: 410 °C (decomposes)
 VAPOR PRESSURE: 0.02 mm Hg (at 150 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: TOCP is absorbed through the skin and via the gastrointestinal and respiratory tract.

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Main critical organ is the neuro-muscular system.

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: Oral lethal dose is estimated to be 1 g/kg; swallowing 6-7 mg/kg has caused serious paralysis. Polyneuritis occurred among workers in a manufacture plant where concentrations of 0.55 to "below 2.5" mg/m3 were measured. Skin absorption was possible. One case of apparently permanent paralysis of the legs is reported in a plant where TCP, containing 6% to 10% TOCP was present. (TOCP is more toxic than the meta- or para-compounds).

SHORT TERM TOX: "Men exposed over a period of several months at 1.5 mg/m3 of commercial hydraulic fluid equivalent to 21% TOCP in toxic activity showed no physical or neurological abnormalities on careful medical examination."

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on the information quoted in the "Human Short Term Tox" section.

Casnr: 7440-61-1 Stofnaam: Uranium en -verbindingen
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,2			Ned:		
USA	1992:	-	0.2	-	0.6	USA:		
UK	1992:	-	0.2	-	0.6	UK:		UK:
BRD	1992:	-	0,25	-	2,5	BRD:		BRD:
Den	1992:	-	0,2			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1132.2 °C
BOILING POINT: 3818 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: In 25 years experience of occupational uranium exposure, well above the level of 0.05 mg/m3 (the former TLV for soluble compounds) no evidence of uranium effects (injury to kidneys or blood) has come to light.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Former TLV was based on extensive toxicologic studies in animals. Based on the lack of evidence of toxic effects after long term occupational exposure at higher levels than this former TLV, the committee recommends raising the TLV to 0.2 mg/m3 for all compounds.

Casnr: 110-62-3 Stofnaam: Valeriaanaldehyde
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	50	175			Ned:		
USA	1992:	50	176			USA:		
UK	1992:					UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	50	175			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: It is a dangerous fire hazard.
MELTING POINT: -91.5 °C
BOILING POINT: 102-103 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is severely irritating to the skin of guinea pigs and eyes of rabbits.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Lethal concentration (rat; 1.2-hour exposure) = 48,000 ppm; all three rats survived 1400 ppm. Acute, inhalation toxicity decreases with increasing chain length of saturated aliphatic aldehydes; Valeraldehyde was considered to be relatively nontoxic systemically. Ten-hour exposures at 310 ppm killed two of 50 mice and five of 20 guinea pigs.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 for mouse and rat are several grams per kg body weight.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL: LD50 (guinea pigs) = > 16.2 mg/kg

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should prevent irritation to the skin and eye. "Industrial experience is needed to evaluate the suitability of this limit."

Casnr: 81-81-2 Stofnaam: Warfarin
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	0,1			Ned:		
USA	1992:	-	0.1			USA:		
UK	1992:	-	0.1	-	0.3	UK:		UK:
BRD	1992:	-	0,5	-	1	BRD:		BRD:
Den	1992:	-	0,1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 161 °C
BOILING POINT: decomposes

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: LD50 (rat) = 3 mg/kg (NIOSH) (omgerekend LC50 humaan = 21 mg/m3) and 160 mg/kg (other investigator) (omgerekend LC50 humaan = 1120 mg/m3). LD50 of mice, dogs, guinea pigs, rabbits and chickens; in oral and intravenous administration range from 100 to 800 mg/kg (omgerekende LC50 humaan = 700 - 5600 mg/m3). LD50 (rat) ip en iv = 420 en 186 mg/kg respectively.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:

SHORT TERM TOX:
LONG TERM TOX: After a loading dose, 5 to 7.5 mg/day (omgerekend 0,5 tot 0,75 mg/m3) keeps the prothrombin time at two or three times normal.
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is lower than the acute toxicity would indicate, because warfarin has a cumulative effect.

Casnr: 7722-84-1 Stofnaam: Waterstofperoxide 90%
Synoniemen:

		tg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994: 1	1	1,4			Ned:	Nee	
USA	1992: 1	1	1.4			USA:		
UK	1992: 1	1	1.5	2	3	UK:		UK:
BRD	1992: 1	1	1,4	2C	2,8C	BRD:		BRD:
Den	1992: 1	1	1,4			Den:		
Zwed	1990: 1	1	1,4	2C	3C	Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -0.4 °C

BOILING POINT: 152 °C

VAPOR PRESSURE: 5 mm Hg (at 30 °C)

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION: It is a normal metabolite in human cells. After skin absorption, the compound is rapidly broken down in the dermis. 33% of a 19% sublingual applied hydrogen peroxide solution in cats is exhaled within one hour (SCG).

BIOTRANSFORMATION: It is broken down to water and oxygen by catalase and glutathione peroxidase; via other pathways, hydroxyl radicals may be formed (SCG).

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): It can irritate and erode the skin, the eyes and mucous membranes (SCG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): 4-Hour LC50 (rats) = 2000 mg/m3 (SCG).

SHORT TERM TOX: Exposure to 22 ppm (from a 90% sol.) (6 h/d; 5 d/w; 6 months) resulted in hair bleaching and irritation around the snout of rabbits, but no eye irritation. Dogs exposed to 7 ppm (6 h/d; 5 d/w; 6 months) developed bleached and bare spots on their coats after 14 weeks. After 24 weeks their eyes began to water and they began to sneeze. Pathological changes were skin thickening and changes in the lungs (emphysema etc.) (SCG, ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY: 0.1 and 0.4% peroxide was given in drinking water (from 8 until 104 weeks) of mice. The highest dose group showed a higher incidence of duodenal carcinomas. All animals showed corrosive stomach damage and duodenal hyperplasias. In the highest dose group, the corrosive changes were already seen after 30 days. The incidence of tumors in mice is negatively correlated with the catalase activity of the animals.

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rats) = 4060 mg/kg. Application of a 15% solution in acetone caused local necroses, inflammatory reactions and capillary damage, but 5% did not. Twice weekly application of a 5% solution in acetone on mice did not increase the skin tumor incidence within 51 weeks (SCG).

4:MUTAGENICITY: SCE; DNA repair - and DNA strand breaks in E. coli and in several in vitro tests were all positive. The genetic effects in vitro can be affected by the amount of catalase present (SCG).

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure to vapors of 90% peroxide was irritating to workers (no concentrations given).

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: It has mutagenic activity in vitro and some carcinogenic activity in experimental animals. IARC has stated that "there is limited evidence that hydrogen peroxide is carcinogenic to experimental animals". Critical effect is irritation on mucous membranes.

ACGIH: TLV should minimize the likelihood of irritation and bleaching of the hair. Further experience is needed.

Casnr: 7440-33-7 Stofnaam: Wolfram en -verb. (in water onoplosbaar)
Synoniemen: Tungsten

		tgg		STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned	1994:	-	5			Ned:		
USA	1992:	-	5	-	10	USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:	-	5			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 3410 °C
BOILING POINT: 5927 °C

2:TOXICOKINETICS: Tungsten antagonizes the action of molybdenum.
UPTAKE AND DISTRIBUTION: Tungsten is generally distributed throughout the body organs following administration.
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX: 0.5% Tungsten trioxide (as W) in the diet of rats was lethal; 0.1% resulted in slight weight loss (= omgerekend 230 mg/m3). Feeding tungsten at levels of 2; 5 and 10% of the diet to weanling rats, females, but not males developed a 15% reduction in body weight; it was concluded that W metal powder was not altogether inert. It did not produce a distinct fibrosis, however.
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: Ip LD50 for W metal powder (rats) = 5 g/kg body weight. Survivors showed minor gross changes in the liver and spleen. Ip administration of 5 g/kg bw tungsten carbide was not lethal for rats. At post-mortem examination the animals showed a typically inert response. Also after intra-tracheal injection of tungsten (three 50 mg doses, one week apart) tungsten carbide in guinea pigs, this compound reacted inert. The same administration of tungsten metal powder resulted in moderate interstitial cellular proliferation and was judged "relatively inert". In one study where 50 mg W dust was administered intra-tracheally, this resulted in proliferation of the intra-alveolar septa, espacially in those areas where dust had visibly accumulated.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):

ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: Long occupational exposure at air concentrations in the order of 5 mg/m3 (W or insoluble compounds) did not result in pneumoconiosis in workers. Atmospheric concentrations considerably below 5 mg/m3 were easily achieved in a plant producing cemented tungsten carbide products. An incidence of 9-11% of pulmonary fibrosis was found among Russian employees exposed to tungsten without concomitant cobalt exposure.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV seems consistent with the reported physiologic activity of the insoluble compounds.

Casnr: 7440-33-7 Stofnaam: Wolfram en -verbindingen (in water oplosbaar)
Synoniemen: Tungsten

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1	-	3	USA:		
UK	1992:	-	1	-	3	UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:	-	1			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 3410 °C
BOILING POINT: 5927 °C

2:TOXICOKINETICS: Tungsten antagonizes the action of molybdenum.
UPTAKE AND DISTRIBUTION: Tungsten is generally distributed throughout the body organs following administration.
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX: Guinea pigs treated orally or iv with W or sodium tungstate showed anorexia, colic, incoordination of movement, trembling, dyspnea and weight loss followed by delayed death.
SHORT TERM TOX: 0.5% sodium tungstate (as W) in the diet of rats was lethal; 0.1% of the sodium tungstate or 0.5% of ammonium tungstate resulted only in slight weight loss (0.1% = omgerekend 230 mg/m3).
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: Sc LD50 of sodium tungstate (rats) = 140-160 mg/kg (as W). Very young rats can tolerate a higher dose than old rats.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES: Occupational effects from the soluble compounds of tungsten are virtually unknown according to NIOSH in 1977.

MOTIVATION OF THE OCCUPATIONAL STANDARDS: A lower TLV than the TLV for insoluble compounds has been recommended, in view of the degree of systemic toxicity of soluble compounds of tungsten.

Casnr: 1477-55-0 Stofnaam: Xyleen, alpha, alpha'-diamine (m-)
Synoniemen: MXDA

	tgg	STEL	Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	0,1C	Ned: Nee	Nee	
USA 1992:	-	0.1C	USA: Ja		
UK 1992:			UK:		UK:
BRD 1992:			BRD:		BRD:
Den 1992:	0,02C	0,1C	Den: Ja		
Zwed 1990:			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

SOLIDIFIES: 141.1 °C
BOILING POINT: 247 °C
VAPOR PRESSURE: 15 mm Hg (at 145 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): MXDA is strongly irritating to the skin; The undiluted compound is corrosive to the skin of guinea pigs; a 50% emulsion in an acetone- dioxane mixture was severely irritating, whereas 10% showed little effect. A 10% aqueous solution caused severe erythema and irritation and repeated applications of a 5% solution caused swelling and redness.
SENSITIZATION: (SK/RESP): In one study, sensitization followed repeated application of MXDA to the skin of guinea pigs. This finding was not duplicated.

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure of rats to 1.74 to 6.04 mg/l of an aerosol of MXDA (= 1740 to 6040 mg/m3!!!) during one hour, resulted in eye irritation, lacrimation and labored breathing. Several animals died within 48 hours and up to 14 days after exposure; = the end of observation period. Of the surviving animals, females showed reduced weight gain. At necropsy findings were found chiefly in the lungs, but also changes in the liver and kidneys were seen. LC50 one hour exposure, 14 days observation, = 3.75 mg/L (= 700 ppm).

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: Acute toxicity (rat) = 930 - 1500 mg/kg. (LD50 ???)

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL: LD50 (rabbit) = 200 mg/kg.

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on analogy with phenylene diamine; the dermal effects seem similar, but the oral toxicity appears less.

Casnr: 1300-73-8 Stofnaam: Xylidine
Synoniemen: Aminodimethylbenzeen

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0.5	2.5			Ned:		
USA	1992:	0.5	2.5			USA:	Ja	
UK	1992:	2	10	10	50	UK:	Ja	UK:
BRD	1992:	5	25			BRD:	Ja	BRD:
Den	1992:	2	10			Den:	Ja	
Zwed	1990:					Zwed:		Zwed:

The mixed isomers include 2,3-; 2,4-; 2,5-; 2,6-; 3,4-; and 3,5-Xylidine.

1:PHYSIOCHEMICAL PROPERTIES:

BOILING POINT: 213 to 226 °C

VAPOR PRESSURE: < 1 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (mice, 2,4-is.) = 149 ppm, 7-h exposition.
SHORT TERM TOX: Mice, rats, rabbits, cats and dogs, exposed to 45 ppm 2,4-Xylidine; 7 h/d; 5 d/w; 44 weeks, showed mortality and liver damage in all species. Cats, dogs and mice had elevated methemoglobin levels and increased numbers of Heinz bodies. Rats, guinea pigs and rabbits, but not cats (who showed liver toxicity), tolerated (without effects???) exposure to 17.5 ppm; 7 h/d; 5 d/w (? weeks). At 50 to 142 ppm they had increased mortality, pneumonitis and degeneration of cells in the heart, liver and kidneys. One monkey and two cats tolerated 92 exposures at 7.8 ppm without effect.

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 (rat) = 470- 1300 mg/kg; (mouse) = 250 - 1070 mg/kg, depending on the type of isomer. (it seems that 2,4-Xylidine is the most toxic compound)
SHORT TERM TOX: NEL = 10 mg/kg 2,4-xyl./day for 7 days in rats (omgerekend 70 mg/m3). Higher doses produced in dose-related increase in liver weight, and decrease of glucose-6-phosphatase in the liver. Severe liver damage was only produced at 400 mg/kg/day.
Rats were given by stomach tube, 117 mg/kg of the 2,4-; or 157 mg/kg of the 2,6-isomers. The latter produced hemosiderosis in the spleen; the former caused a decrease in body weight gain, enlargement of the liver and kidneys, hepatocellular necrosis and biliary hyperplasia.
One week 100 mg/kg 2,4-; 2,5-; and 2,6-is./day followed by 500 mg/kg of the same compounds to male rats, produced increased liver weight, proliferation of the endothelial system, enlargement of hepatocytes, decreased glycogen and glucose-6-phosphatase in the liver, and an increase of P450 microsomal protein and glucuronyltransferase in the liver.
Daily administration of 20; 100; or 500 mg 2,4-is./kg for four weeks to male and female rats, produced an increase in liver weight, whereas the highest dose (increased after two weeks to 700 mg/kg), caused mortality, body weight reduction, decreased hemoglobin and hematocrit and liver cell necroses.
NEL in Beagle dogs (one male and one female per "group") = 2 mg 2,4-is./kg (by stomach tube!) in a 4-weeks study (= omgerekend 14 mg/m3). Higher doses produced vomiting and 50 mg/kg had effects on the liver.
Diets containing 275 or more ppm 2,4- xylidine, during 6 months, affected liver and kidneys seriously in rats (= omgerekend 97 mg/m3).
LONG TERM TOX:
CARCINOGENICITY: 2,4-Xylidine showed no carcinogenicity in a study in male rats at feeding levels of 4000 ppm in the first three months, followed by 500 ppm for two months and 1000 ppm for an additional 13 months.
Female and male mice were fed 125 or 250 ppm 2,4-Xylidine for 18 months. The females in the highest group had significantly higher incidence of lung tumors. Male rats were fed 6000 or 12,000 ppm 2,5-Xylidine for 5 months and then resp. 3000 or 6000 ppm for an additional 13 months. The compound was not carcinogenic. Male and female mice were fed 6000 or 12,000 ppm 2,5-Xylidine for 18 months. The males in the lower group had significantly increased vascular tumors.

In a transplacental carcinogenicity study on 2,6-Xylidine with rats, the compound was carcinogenic in both sexes at a feeding level of 3000 ppm (adenomas and carcinomas in the nasal cavity, and subcutaneous fibromas and fibrosarcomas). Although it was a transplacental study, the offspring were fed 2,5?-Xylidine after weaning for 102 weeks!!! There was a lower survival rate in 1000 and 3000 ppm male groups (but not in 300 ppm group), and in 3000 ppm females. Body weight gain was decreased in male and female highest group.

REPRODUCTION TOX:

OTHER STUDIES: A single iv injection of 0.25 mM/kg of all isomers produced methemoglobin levels in the blood of cats from 6.3% to 38.3%.

3.4:DERMAL:

4:MUTAGENICITY: Most of the investigators found the isomers to be positive in the Ames test, after metabolic activation. 2,6-Xyl. was negative in a Drosophila recessive lethal test, but was positive in a SCE test and in chromosomal aberration test. In a recombinant assay, the only positive isomer was 2,4-xylidine. 2,5- and 2,4-Xylidine were not active in a DNA breakage test, after metabolic activation. 2,4-; 2,5- and 3,4-isomers (but not the others) inhibited testicular DNA synthesis in male mice when oral applied at 200 mg/kg or 100 mg/kg by ip injection.

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: According to NIOSH, the immediately dangerous to life and health level = 150 ppm.

SHORT TERM TOX: It is suggested that a long-time exposure at 10 ppm xylidine is lethal to humans.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The "old" TLV was based on the value for aniline. The reduction of the TLV to 0.5 ppm is based on the carcinogenicity of the most important isomers and the possible weak genotoxic action of all isomers.

Casnr: 7440-65-5 Stofnaam: Yttrium
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	1			Ned:		
USA	1992:	-	1			USA:		
UK	1992:	-	1	-	3	UK:		UK:
BRD	1992:	-	5	-	50	BRD:		BRD:
Den	1992:	-	1			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1522 ± 8 °C
BOILING POINT: 3338 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): After intratracheal application of a single dose of 50 mg yttriumoxide in rats, diffuse sclerosis, and diffuse and modular (nodular) fibrosis in the lungs occurred, which was attributed to the specific chemical action of yttrium.
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: LD50 (rat, ip) of Yttrium nitrate; -chloride and -oxide are respectively 350; 450 and 500 mg/kg.
Rats who were injected every other day for 5 months, with 60 mg/kg Yttrium, with a total dosage of 936 mg/rat, showed no accumulation in the bones, although deposition occurred, which slowed to an insignificant rate when the bone burden reached 150-200 ppm yttrium.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:
SHORT TERM TOX: Workers, who were exposed to dust of yttrium europium vanadate, (average concentration of yttrium was 1.4 mg/m3) showed mild irritation of the eyes, upper respiratory passages and skin, which however was attributed to vanadate.
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should protect against adverse effects of all forms of the element.

Casnr: x Stofnaam: Yttriumverbindingen
Synoniemen:

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	tatie	geen	serend
Ned	1994:	-	1		Ned:		
USA	1992:	-	1		USA:		
UK	1992:				UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992:	-	1		Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES: various.

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST): After intratracheal application of a single dose of 50 mg yttriumoxide in rats, diffuse sclerosis, and diffuse and modular (nodular) fibrosis in the lungs occurred, which was attributed to the specific chemical action of yttrium.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES: LD50 (rat, ip) of Yttrium nitrate; -chloride and -oxide are respectively 350; 450 and 500 mg/kg.
Rats who were injected every other day for 5 months, with 60 mg/kg Yttrium, with a total dosage of 936 mg/rat, showed no accumulation in the bones, although deposition occurred, which slowed to an insignificant rate when the bone burden reached 150-200 ppm yttrium.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:
IRRITATION (SK/MM/EY/RESP):
SENSITIZATION (SK/RESP):
ACUTE TOX:

SHORT TERM TOX: Workers, who were exposed to dust of yttrium europium vanadate, (average concentration of yttrium was 1.4 mg/m3) showed mild irritation of the eyes, upper respiratory passages and skin, which however was attributed to vanadate.

LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should protect against adverse effects of all forms of the element.

Casnr: 9005-84-9 Stofnaam: Zetmeel
Synoniemen: Stijfsel, Starch

		tgg		STEL		Huidno- tatie	Carcino- geen	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	10*			Ned:	Nee	
USA	1992:	-	10			USA:		
UK	1992:	-	10*			UK:		UK:
BRD	1992:					BRD:		BRD:
Den	1992:					Den:		
Zwed	1990:					Zwed:		Zwed:

Geen onderbouwing aanwezig.

Volgens Zielhuis in RA 9/90 zijn krijt (calciumcarbonaat); gips (calciumsulfaat); en rouge terecht inerte stoffen genoemd. Van deze drie stoffen zijn de TLV onderbouwingen (voor zover aanwezig) niet bekeken.

Casnr: 7646-85-7 Stofnaam: Zinkchloride (rook)
Synoniemen:

	tgg		STEL		Huidno-	Carcino-	Sensibili-
	Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen	serend
Ned 1994:	-	1			Ned:		
USA 1992:	-	1	-	2	USA:		
UK 1992:	-	1	-	2	UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	-	0,5			Den:		
Zwed 1990:	-	1			Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: ~ 290 °C
BOILING POINT: 732 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:
ACUTE TOX (LOC/SYST):
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:
ACUTE TOX:
SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Exposure can result in irritation and damage of the mucous membranes of the nasopharynx and the respiratory tract, eventually leading to a severe pneumonitis.

Zinc chloride is caustic and can cause ulceration of the exposed skin.

SENSITIZATION (SK/RESP):

ACUTE TOX: Exposed persons have experienced a pale grey cyanosis.

Deaths were reported in an accident with generators. Necropsies revealed red and edematous membranes lining the larynx, trachea and bronchi, with spots of necrosis.

In another fatal case of exposure to zinc chloride smoke, the patient developed advanced pulmonary interstitial fibrosis, acute cor pulmonale and right ventricular hypertrophy, and ultimately died from acute respiratory insufficiency.

Exposures to 0.04- 0.7 mg ZnCl₂ fume/m³ for 30 minutes did not result in sensory effects (pers. comm.)

SHORT TERM TOX:

LONG TERM TOX: One author is cited who herself cited references suggesting that zinc compounds may have chronic effects.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV should protect against respiratory irritation and other effects.

Casnr: 557-05-1 Stofnaam: Zinkstearaat
Synoniemen:

		tgg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
Ned	1994:	-	10*			Ned:	Nee
USA	1992:					USA:	
UK	1992:	-	10*			UK:	UK:
BRD	1992:					BRD:	BRD:
Den	1992:					Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 120-132 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Zinc stearate was not irritating in rabbit studies.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 (rats; one hour exposure) = (>) 200,000 mg/m3.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: Intra-tracheal administration of 50 mg zinc stearate in rats, for 2 months, produced alveolar and bronchial damage.

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX: One case of a worker who died from extensive lung fibrosis is described. Zinc, originated from zinc stearate dust was found spread throughout the lung tissue. The man had worked for 29 years in a rubber factory. Other observations in the rubber industry have revealed no adverse effects from long term inhalation of zinc stearate dust. Infants who had aspired zinc stearate powder, developed respiratory distress.

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: Zinc stearate is to be considered a nuisance dust. It does not seem to produce big adverse effects on the lungs, nor significant organic disease when exposures are kept under reasonable control. Therefore the respirable dust TLV is eliminated.

Casnr: 7440-67-7 Stofnaam: Zirconium en -verbindingen
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	-	5			Ned:		
USA	1992:	-	5	-	10	USA:		
UK	1992:	-	5	-	10	UK:		UK:
BRD	1992:	-	5	-	50	BRD:		BRD:
Den	1992:	-	5			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:
MELTING POINT: 1852 ± 2 °C
BOILING POINT: 4377 °C

2:TOXICOKINETICS:
UPTAKE AND DISTRIBUTION:
BIOTRANSFORMATION:
ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP):
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST):

SHORT TERM TOX: Five different animal species were exposed to 75 and 11 mg Zr/m3 (in zirconium oxide dust; size: 1.5 microns) during 30 or 60 days; or 60 days to 6 mg Zr/m3 (as zirconium tetrachloride dust; size: 0.6 microns). Only at exposures to the high(?) concentrations of the tetrachloride toxic effects were noted, presumably caused by the liberated hydrogen chloride. Also two one-year studies were carried out, one on the oxide dust and the other with the tetrachloride, both at a concentration of 3.5 mg Zr/m3 (no results given).

LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.3:ORAL:

ACUTE TOX: LD50 zirconium tetrachloride (rat) = 1688 mg/kg; (mice) = 655 mg/kg; for zirconium tetrafluoride (rat) = 98 mg/kg.

SHORT TERM TOX:
LONG TERM TOX:
CARCINOGENICITY:
REPRODUCTION TOX:
OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: The sale of aerosol spray antiperspirants containing zirconium has been restricted due to suspected toxicity.

SHORT TERM TOX:
LONG TERM TOX:
EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: As a result of the mentioned studies, it is concluded that the metal is of very low toxicity.

Casnr: 7783-41-7 Stofnaam: Zuurstofdifluoride
Synoniemen: Difluoroxid (Deens)

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994: 0,05C	0,1C			Ned:		
USA	1992: 0.05C	0.11C			USA:		
UK	1992:				UK:		UK:
BRD	1992:				BRD:		BRD:
Den	1992: 0,05C	0,1C			Den:		
Zwed	1990:				Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -223.8 °C

BOILING POINT: -114.8 °C

VAPOR PRESSURE: > 750 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The gas was irritating to the respiratory tract at concentrations above 0.5 ppm (exposure for a few hours), resulting in pulmonary edema and hemorrhage (species?). Tolerance developed following a single low-level (0.1 ppm) exposure. Young animals were more susceptible to the pulmonary action than old animals.
SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): LC50 60 minutes (mice) = 1.5 ppm; (rat) = 2,6 ppm; (monkey) = 16 ppm and (dog) = 26 ppm.

Two daily 7-hour exposures down to and at 0.5 ppm were lethal to various species. In exposures of a few hours at concentrations above 0.5 ppm, the gas was soporific.

SHORT TERM TOX: Daily 7-hour exposures to 0.1 ppm for 30 days showed no detectable effects by several animal species, including one non-rodent. (gas purity was 70- 90%; impurities appeared to be chiefly nitrogen and oxygen). Effects of OF2 were noted on the cortica medullary zone of the kidney (source?).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX: Effects of OF2 were noted on the internal genitalia consisting of distension and congestion of the organs.

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX: OF2 resembles ozon and showed effects of elemental fluorine gas.

SHORT TERM TOX: (?) Inhalation of the gas in a concentration of 1 ppm, resulted in an intractable headache.

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: TLV is based on experimental demonstration (there was a sharp cut-off in effect below 0.5 ppm; 1945) and by analogy with ozone and fluorine gas. The Comm. states that the safety margin may not be particularly great in view of the great toxicity, especially for small rodents.

Casnr: 10025-67-9 Stofnaam: Zwavelmonochloride
Synoniemen:

		tg	STEL		Huidno-	Carcino-	Sensibili-
		Ppm	Mg/m3	Ppm	Mg/m3	tatie	geen
Ned	1994:	1C	6C			Ned:	Nee
USA	1992:	1C	5.5C			USA:	
UK	1992:	-	-	1	6	UK:	UK:
BRD	1992:	1	6	2C	12C	BRD:	BRD:
Den	1992:	1C	6C			Den:	
Zwed	1990:					Zwed:	Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -77 °C

BOILING POINT: 138 °C

VAPOR PRESSURE: 6.8 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): The compound is considered to be an upper respiratory tract irritant, because of the ability to release hydrochloric acid. When the undecomposed vapor might reach the lungs, it would be more toxic than an equivalent quantity of HCl.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure for one minute at 150 ppm was fatal to mice. Exposure for 15 minutes at 48 ppm was lethal for cats within a few days, but at 12 ppm was tolerated.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP): Concentrations of 2 - 9 ppm were only mildly irritating. This concentration may have included a high proportion of hydrogen chloride.

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The ceiling limit is believed to be low enough to avoid injury and discomfort, however they say that more experience data are needed.

Casnr: 5714-22-7 Stofnaam: Zwavelpentafluoride
Synoniemen:

		tgg		STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
		Ppm	Mg/m3	Ppm	Mg/m3			
Ned	1994:	0,01	0,1			Ned:		
USA	1992:	0.01C	0.1C			USA:		
UK	1992:	0.025	0.25	0.075	0.75	UK:		UK:
BRD	1992:	0,025	0,25	0,05C	0,5C	BRD:		BRD:
Den	1992:	0,01C	0,1C			Den:		
Zwed	1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -92 °C

BOILING POINT: 29 °C

VAPOR PRESSURE: 561 mm Hg (at 20 °C).

2:TOXICOKINETICS:

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS:

3.1:IRRITATION (SK/MM/EY/RESP): Exposure at 1ppm for 16-18 hours resulted in irritation of the lungs, 0.1 ppm had no effect.

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): Exposure for one hour at 10 ppm caused multiple diffuse hemorrhagic lesions in the lungs of rats and at 1 ppm caused severe congestion of the lungs. The lungs of remaining rats were normal after 24 hours. Exposure for one hour at 0.1 ppm had no effect.

Exposures at 1 ppm for 16 to 18 hours were fatal for rats; 0.1 ppm resulted in irritation of the lungs, while 0.01 ppm had no discernible effects.

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES: LD50 iv (rabbits) = 5.8 mg/kg. Death was due to fulmigrant pulmonary edema.

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS: The compound is considered to be a primary irritant, with no known chronic effect. This ceiling should minimize even transient irritation and complaints. There is no implication that brief, small excursions above the ceiling are life-threatening or have the potential for creating permanent harm.

Casnr: 7783-60-0 Stofnaam: Zwaveltetrafluoride
Synoniemen: T4

tgg			STEL		Huidno- tatie	Carcino- geen Nee	Sensibili- serend
	Ppm	Mg/m3	Ppm	Mg/m3			
Ned 1994:	0,1C	0,4C			Ned:		
USA 1992:	0.1C	0.44C			USA:		
UK 1992:	0.1	0.4	0.3	1	UK:		UK:
BRD 1992:					BRD:		BRD:
Den 1992:	0,1C	0,4C			Den:		
Zwed 1990:					Zwed:		Zwed:

1:PHYSIOCHEMICAL PROPERTIES:

MELTING POINT: -124 °C

BOILING POINT: -40 °C

2:TOXICOKINETICS: T4 reacts strongly with water forming SO2 and HF.

UPTAKE AND DISTRIBUTION:

BIOTRANSFORMATION:

ELIMINATION:

3:ANIMAL EXPERIMENTS: Toxic effects are primarily ascribed to the formation of SO2 and HF (SCG).

3.1:IRRITATION (SK/MM/EY/RESP): T4 is irritating to eyes and respiratory passages (SCG).

SENSITIZATION: (SK/RESP):

3.2:INHALATION:

ACUTE TOX (LOC/SYST): T4 is extremely toxic to rats (SCG); a 4-hour exposure to 20 ppm was lethal to one of two rats. On autopsy lethally exposed rats showed pulmonary edema (ACGIH).

SHORT TERM TOX: Ten 4-hour exposures to 4 ppm (5 d/w) resulted in lung damage (emphysema) in rats (SCG), which was reversed within 14 days (ACGIH).

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.3:ORAL:

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

CARCINOGENICITY:

REPRODUCTION TOX:

OTHER STUDIES:

3.4:DERMAL:

4:MUTAGENICITY:

5:OBSERVATIONS IN MAN:

IRRITATION (SK/MM/EY/RESP):

SENSITIZATION (SK/RESP):

ACUTE TOX:

SHORT TERM TOX:

LONG TERM TOX:

EPIDEMIOLOGICAL STUDIES:

MOTIVATION OF THE OCCUPATIONAL STANDARDS:

SCG: The formation of SO2 and HF are probably responsible for the toxic effects of the compound.

ACGIH: In view of the definite signs of injury produced by a relative brief exposure at low concentrations (4 ppm) a ceiling was recommended, which should provide a wide margin of safety against chronic effects due to fluoride.