

Analyses in Thermal Conversion

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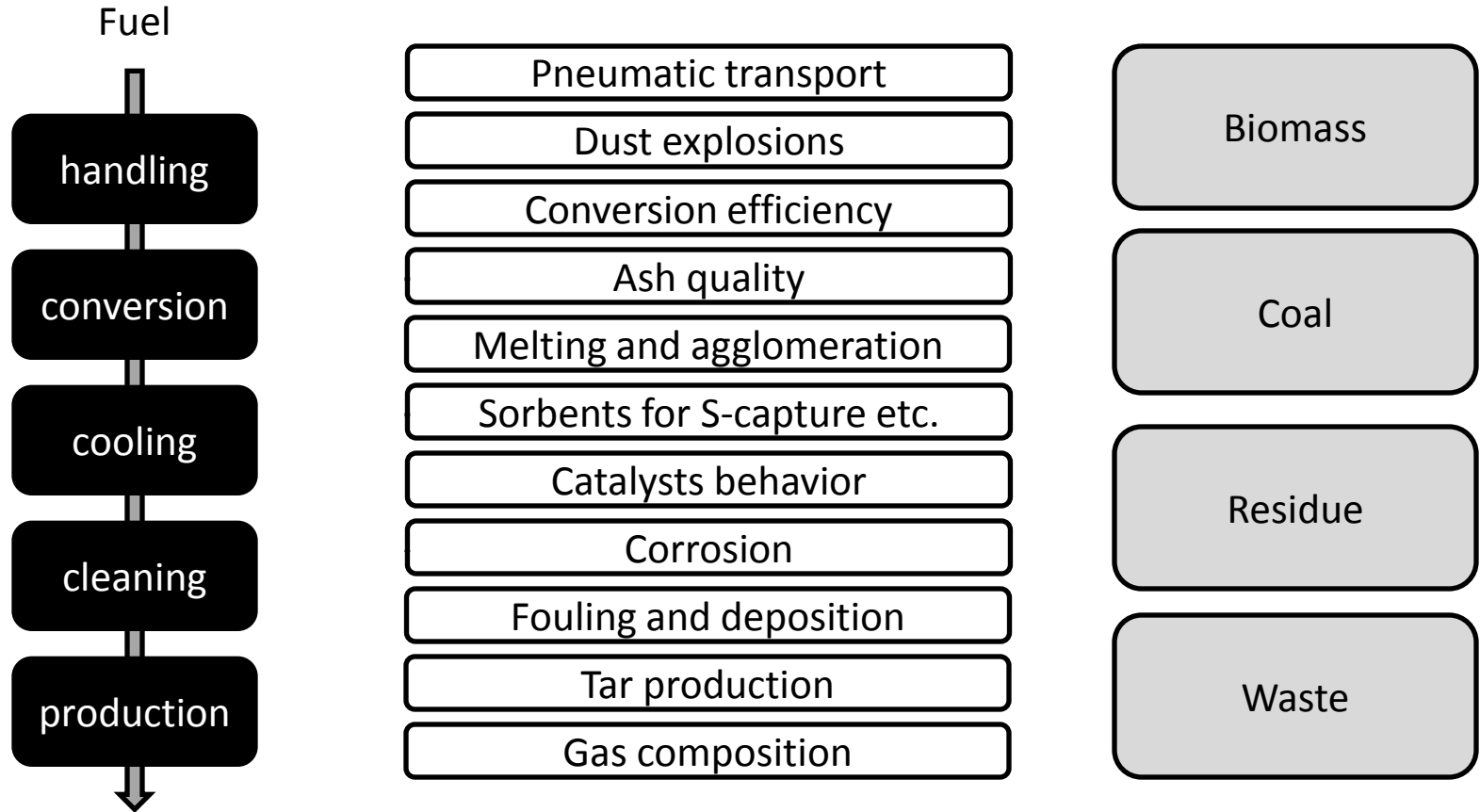


ANALYSES in THERMAL CONVERSION

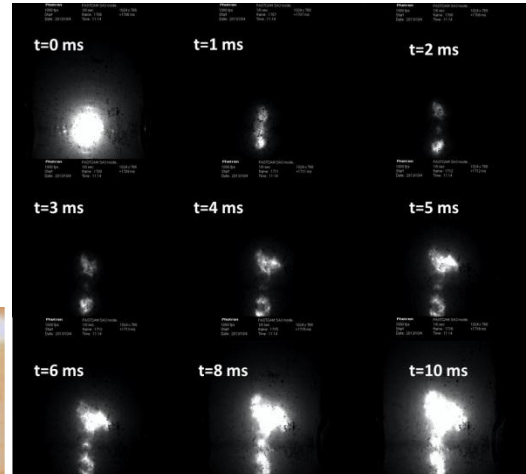
Bram van der Drift
Thermal Analysis Day, Petten, NL
5 February 2015

CONVERSION

combustion, gasification, pyrolysis



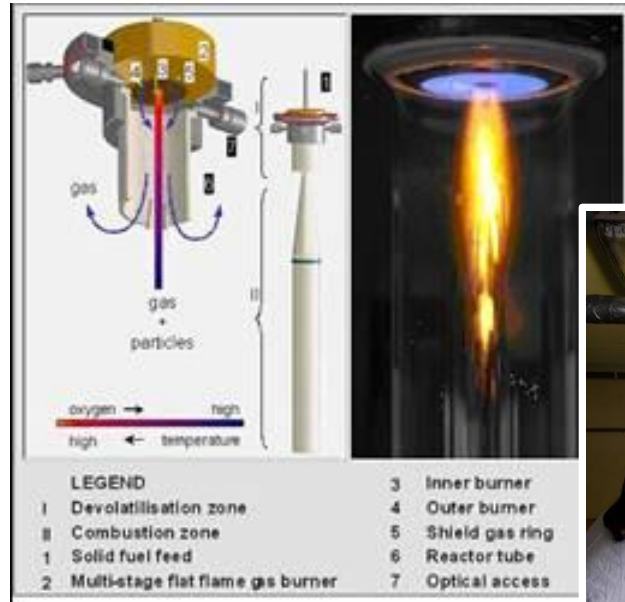
PNEUMATICS and EXPLOSION



Gas consumption, piping erosion,
dust explosion risk of materials,
effect of size distribution, test
explosion suppression methods, ...

CONVERSION

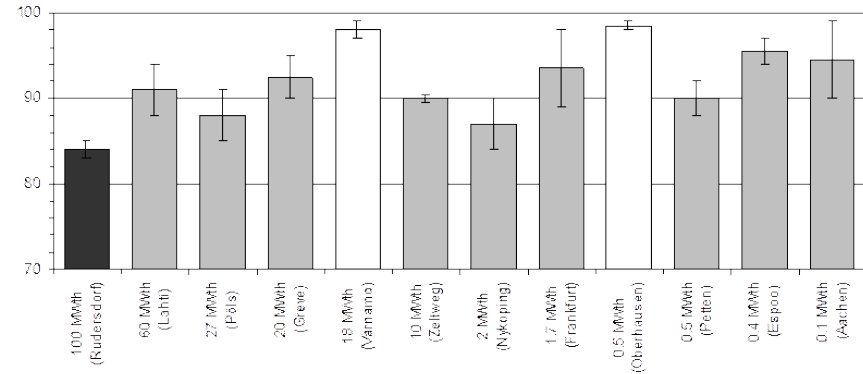
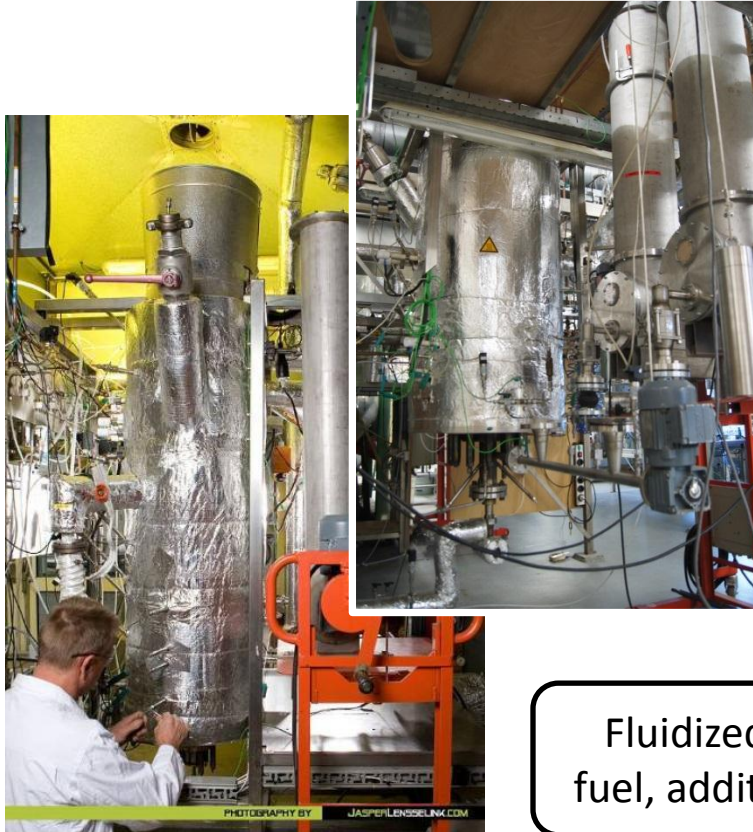
high-temperature (up to 1600°C)



Simulating pulverized
fuel combustion and
gasification, effect of
temperature, fuel size,
steam, ...

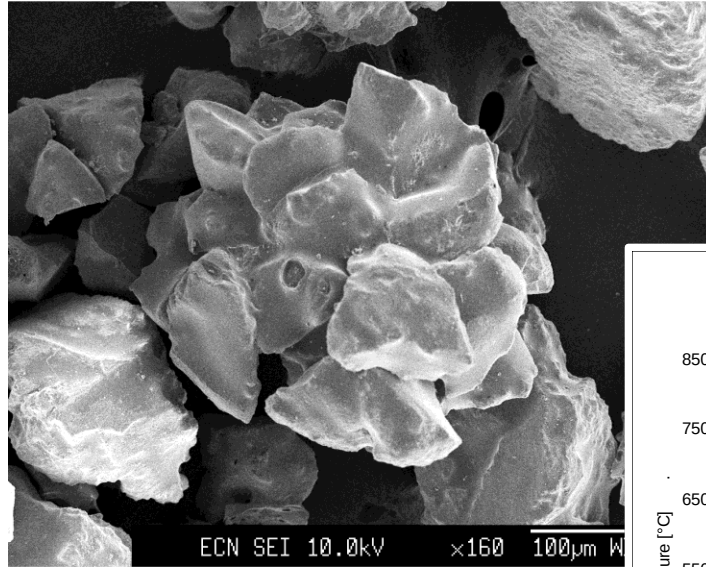
CONVERSION

fluidized bed

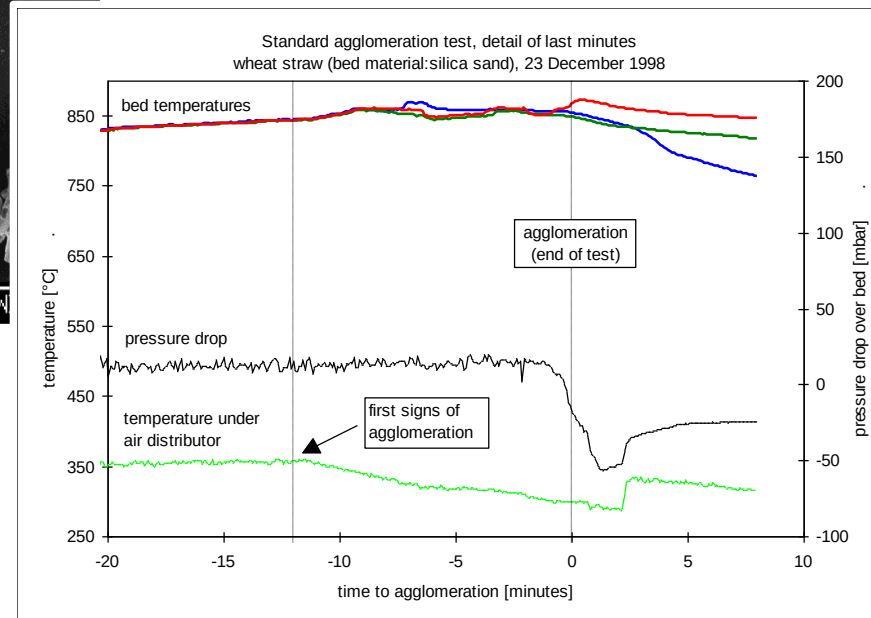


Fluidized bed conversion, effect of
fuel, additives, water, temperature, ...

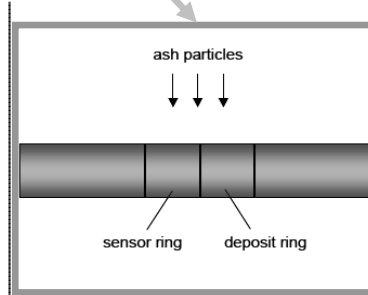
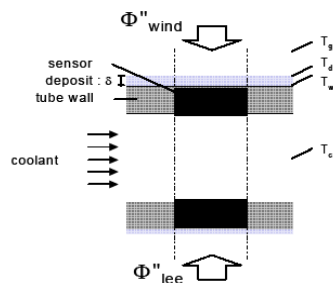
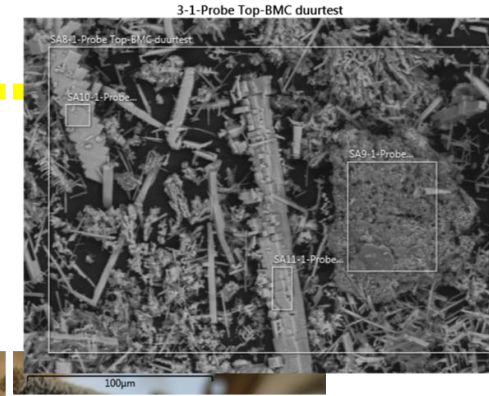
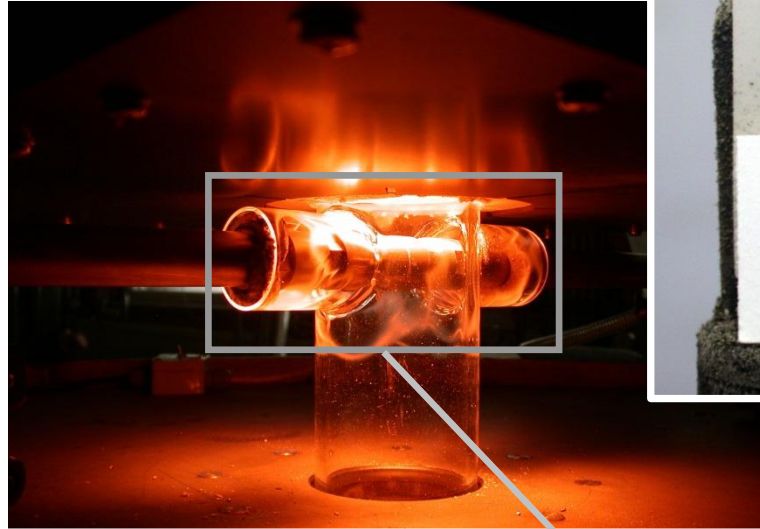
MELTING and AGGLOMERATION



Fluidized bed conversion: at what temperature does it go wrong, what additive can improve this, ...

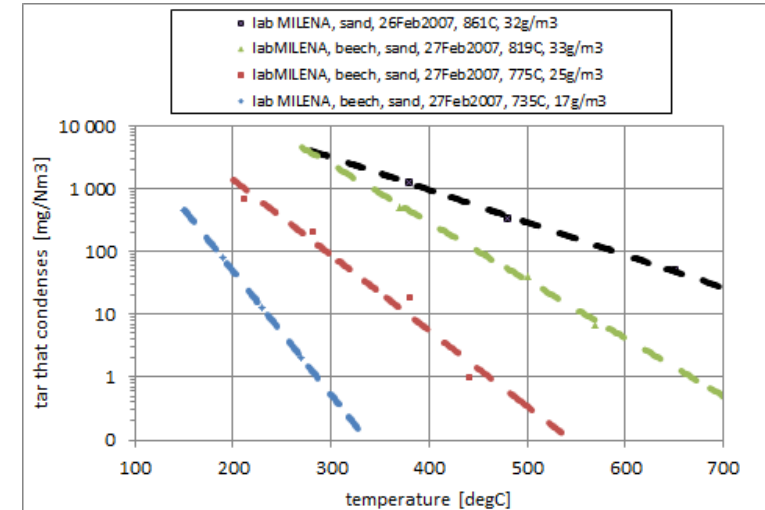


FOULING



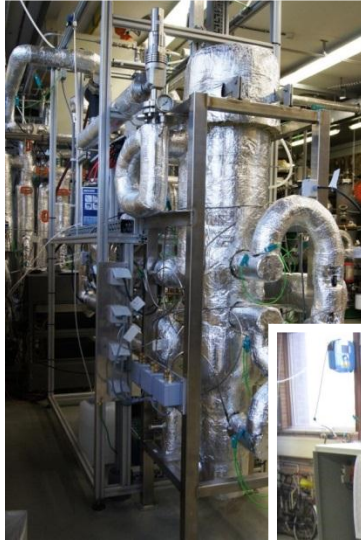
Does my cooler plug, what additive can improve this, does ash melt, ...

TAR PRODUCTION and DEW POINT



How much tar is produced and how much condenses on the cooler surface, ...

CATALYSTS and SORBENTS



Testing sorbents in real gas to remove aromatics, sulphur, CO₂, ...

Testing catalysts in real gases to remove tars, hydrogenate thiophenes, aromatize ethylene, ...

And: testing new methods in separation, synthesis, ...

ADDITIONAL

- Models for prediction (thermodynamic models, expert models, ...)
- References for comparison / database
- Always a link to the real process and technology

- On-line and on-site sampling and analyses
- Phyllis database on composition: www.phyllis.nl

ANALYSES EVERYWHERE

H₂, CO, CH₄, CO₂, H₂O, C₂H₂, C₂H₄, C₂H₆, C₃, C₄...C₆, toluene, xylenes, phenols, PAH's up to coronene, H₂S, COS, mercaptans, thiophenes, NH₃, HCN, pyridines, particles, Ar, Ne, O₂, N₂, ...



THANKS FOR THE ATTENTION

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Fuel composition database: www.phyllis.nl
Tar dew point calculator: www.thersites.nl
IEA bioenergy/gasification: www.ieatask33.org
Milena indirect gasifier: www.milenatechnology.com
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