Indium recovery from secondary sources by electrowinning

R.J.M. Bisselink, M.A.C. Panjer
TNO dept. of Water Treatment
Utrechtseweg 48, 3704 HE Zeist, the Netherlands
Roel.Bisselink@tno.nl

The increasing amount of electronics, such as consumer products and green technologies (e.g. solar PV cells) increases demand of metals such as indium. The European Commission has placed indium amongst a list of materials classified as critical [1]. The increasing demand of these critical metals together with the dependency on import drives research to investigate the recovery of valuable metals from secondary sources, so called urban mining. Flat panel displays (FPD) and CIGS type PV cells were selected as source material for the recovery of indium. A hydrometallurgical process is under development within the RECLAIM project of which electrowinning is the final step. Solvent extraction is used prior to electrowinning to purify indium and uses hydrochloric acid as stripping acid, as it enables selective stripping of indium [2]. In this research, we investigated the electrodeposition of indium using cyclic voltammetry and chronoamperometry. Cyclic voltammetry at graphite shows that the potential for indium electrodeposition is separated from the hydrogen evolution potential with approx. -0.4 V. Chronoamperometry will be used to investigate the influence of electrode potential, indium concentration and impurities on the current efficiency and product purity amongst others.

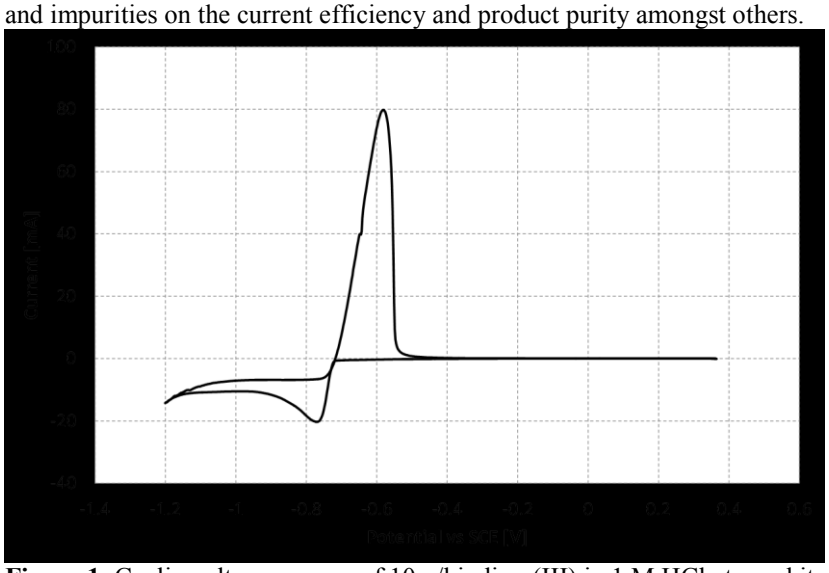

Figure 1 Cyclic voltammogram of 10 g/l indium(III) in 1 M HCl at graphite.

Acknowledgements
This research project (RECLAIM) has been financially supported by the European Commission under the 7th Framework Programme through the Nanosciences, nanotechnologies, materials & new production technologies (NMP) research theme, grant number 309620. The project website www.re-claim.eu gives more inside information on project objectives and partners.

References
[1] European Commission, report on critical raw materials for the EU, report of the Ad hoc Working Group defining critical raw materials, May 2014
[2] S. Virolainen et al., *Hydrometallurgy* **107** (2011), 56-61.