G3II: Relevance of Resources Strategies and Global Competition

Thursday 11 September 2013
Room: Sevilla 3
Chair: M. Hofmann-Amtenbrink
Mat Search Consulting Hofmann, Pully, Switzerland

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Dr. Christian Hagelüken

Christian Hagelüken is Director of EU Government Affairs at Umicore. Between 2003 and 2011 he headed the department for Business Development & Market Research in Umicore's Precious Metals Refining business unit. Before that he had held various management positions in the precious metals department of Degussa AG.

Christian has over 20 years experience in (precious) metals recycling and sustainable metals management and has made numerous contributions to professional books, journals and conferences. He is representing Umicore in related associations, work groups and research co-operations, among others the UNEP Resource Panel and the EU Raw Materials Initiative.

Christian Hagelüken holds university degrees in mining engineering and industrial engineering from RWTH Aachen, Germany, where he also received his Ph.D. in 1991.

13:30 – 13:50

Title: State of the Art of Recycling Less Common Elements – opportunities – challenges – limits

The secured supply of less common elements, which are essential for high-tech applications, is increasingly considered as critical for the European economy. Over the last three decades there has been a booming demand for special and precious metals in products such as catalysts or electronics which will further increase with new emerging technologies, e.g. for renewable energy or electro-mobility. End of life products are potentially an important secondary source for such metals, provided they become accessible for a comprehensive recycling. However, for this purpose the existing recycling approaches mainly designed for flows of mass materials are insufficient. It is important to develop instead highly efficient recycling chains that gain high overall recovery rates also for "technology metals" present only in traces. Hence, after collection of end-of-life products the key challenges are to create transparency about the real material flows in the recycling chain down to the final destination and to ensure innovative, high quality processes throughout this chain. In this context, the management of interfaces between mechanical pre-processing and metallurgical metals recovery as well as the technical-organisational set-up of the entire system are crucial. Significant gaps exist in this area, and current large metal losses can only

Dr. Derk Bol

Derk Bol is program manager at the Materials innovation institute M2i in the Netherlands. He is responsible for the material research projects which are being carried out for Philips, ASML, Henkel and other industrial partners of M2i. Derk Bol is chair of the ERA-MIN workgroup on substitution and rapporteur for EIP Raw Materials operational group on substitution. He is co-author of the M2i study Materials Scarcity and of a study on Critical Materials for the Dutch Technology Industry. Before joining M2i, Derk Bol has gained extensive experience in industry, as systems engineer for space satellite projects at Fokker Space, and as product development consultant for ADSE, an engineering and consultancy firm active in Europe in the aerospace and rail sector. Derk Bol has obtained a PhD degree in Physics at the University of Leiden on macroscopic quantum effects at low temperatures.

13:50 – 14:10

Title: Defining a strategy for substitution - the ERA-MIN roadmap

Substitution is seen as one of the solutions to reduce Europe's strong dependency on raw materials imported from elsewhere. Changing to material resources which are present in Europe or are more widely available globally can help to avoid or mitigate supply risks for European manufacturing industry. In the long term, substitution of scarce raw materials by more abundant ones is necessary to cope with the increasing need for materials of a world population growing to nine billion people in 2050. Finding substitution solutions will be the challenge for the materials science community in the coming decades.

The concept of substitution is simple, but selecting the right substitution targets and new material technologies to come up with solutions is far from straightforward. In this presentation we will discuss, on the basis of the ERA-MIN roadmap on substitution, the intricacies in setting up a roadmap on substitution, but also which solutions have been found. The ERA-MIN roadmap on substitution is the first of its kind in Europe and is used as a blue print for other initiatives like the European Innovation Partnership on Raw Materials.

Prof. Dr. Armin Reller,
Head of Fraunhofer Project Group Materials Recycling and Resource Strategy, University of Augsburg and Fraunhofer Institut für Silicatforschung, Würzburg, Germany

Armin Reller studied Chemistry at the University of Zurich, held a chair at University of Hamburg (1988-1992) and was chair of solid state chemistry at the University of Augsburg and then was chair of Resources Strategy at the same university in 2009. Prof. Reller is Spokesman of the Center of Competence for the Environment.

14:10 – 14:30

Title: Criticality of Materials – future perspectives for industrial application

The lifestyle of high tech societies directly depends on the extensive use of natural or synthetic resources like water, food, metals and polymers etc. The present and future availability of these essential goods is thought to be controlled and guaranteed by merely economic measures. A more detailed analysis of the trajectories of materials along specific supply and production chains reveals however rather critical contexts: the availability of essential resources - in particular functional metals for emerging energy and communication technologies - might be confined by geological scarcity, difficult accessibility of deposits, geo-political issues, etc. Therefore the evaluation of the criticality of strategic resources, above all of functional metals, is a matter of due foresight in order to diminishing risks and at the same time enhancing their performance and their efficient use. In addition the reduction of dissipative losses is decisive for the development and efficient implementation of circular economies for critical resources.

14:30 – 15:00
Panel discussion