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Marie Curie Action: International Outgoing Fellowship

MinePep

Project title:	**Establishing of a novel technology platform for bio-based mineral processing: Development of peptides as agents for the separation of rare earth minerals via bio-flotation**
Project coordinator:	**Helmholtz-Zentrum Dresden–Rossendorf e.V. Germany**
Partner institution:	**University of British Columbia, Canada**
Starting date:	**01.03.2015**
Duration (months):	**24**

Summary

The MinePep project is addressing the development of an innovative, clean process for the recovery of raw materials from primary and secondary sources. Processes for a sustainable recovery of raw materials are an urgent need in Europe in order to ensure the availability of strategic metals and rare earth elements, resource efficiency, the reduction of environmental impacts and in this way economic growth.

Current recycling processes of secondary raw materials are insufficient by reason of scarce research improvement. Bio-based methods such as bioflotation are innovative approaches that could develop into efficient recycling technologies. This project will target the development and application of specific peptides that can be used as agents in flotation processes.

The focus will be on the recovery of rare earth elements from electronic scrap. Apart from economic benefits, this technology will contribute to significantly decrease toxic waste and to implement a closed product cycle. The main technique applied in the MinePep project uses bacteriophage particles which generate special surface peptides that enable the identification of target specific phages by selective target binding. Those phage particles which exhibit the highest target specificity, are separated, modified and multiplied in order to use them in future projects in flotation processes. In particular, phage peptides with high affinity to $LaPO_4$ and Y_2O_3 will be selected.

These compounds are dominant rare earth components of fluorescent phosphors of compact fluorescent lamps. Therefore, such peptides can be used for recycling and recovery of rare earth compounds of fluorescent phosphors. As a long-term goal bioflotation processes will be developed that use phage surface peptides for particle separation. The development of the envisaged techniques will support the European intentions to countervail the stringency of raw material resources.