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The ReAK international research project for the reduction of arsenic content in copper concentrates

Envirochemie is a research partner in a project for the development of an efficient oxidation process to convert arsenic from copper concentrates into a harmless, disposable form.

Chile is the world's largest copper producer and copper exporter with 27 percent of global production. However, copper mining involves economic and ecological challenges. The copper content in the ore currently being mined is between 0.5 and two per cent, but the level of contamination with arsenic, antimony and bismuth is quite high. Arsenic in particular is a highly toxic, inorganic pollutant that poses a hazard to human health and to the global ecosystem as a whole. Processes that are currently available for the separation and stabilisation of arsenic are economically unprofitable.

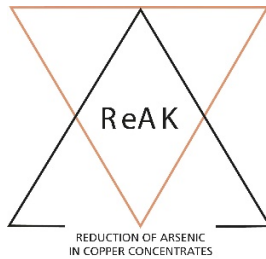
The primary objective of the "ReAK — Reduction of Arsenic in Copper Concentrations" project funded by the German Federal Ministry of Education and Research (BMBF) is the optimisation and further development of existing processes as well as the establishment of new processes to deal with arsenic-rich copper ores and their concentrations.

The research project is taking a look at the entire process chain of copper production from copper ores, from the separation of by-products to the stabilisation of the arsenic to the disposal of the residue. The arsenic needs to be separated and converted from As(III) to As(V). In this form, it has stable bonds and can be deposited without any harmful effects.

Envirochemie GmbH is working on innovative oxidation technologies to oxidise As(III) to As(V) economically and ecologically. In addition, Envirochemie is also expanding its own Envirochem AOP product line. Oxidation processes using hydrogen peroxide and UV light or ozone and ultrasound cause the formation of highly reactive, so-called hydroxyl radicals that oxidise the arsenic. Which process combination under what process conditions is best suited for an efficient and environmentally-friendly oxidation of the arsenic in the copper mining residue is currently being investigated in comprehensive laboratory studies at the in-house technical centre at Envirochemie.

The company will also be working in close cooperation with nine national project partners (Fraunhofer IWKS, Aurubis AG, Borregaard Deutschland GmbH, Federal Institute for Geosciences and Natural Resources (BGR), EKOF Mining & Water Solution GmbH, Outotec GmbH & Co.KG, Freiberg University of Mining and Technology, Wismut GmbH) and seven international project partners (Alta Ley, Deutsch-Chilenische Industrie- und Handelskammer, EcoMetales, Pontificia Universidad Católica de Chile, Sustainable Minerals Institute, International Centre of Excellence, Universidad de Concepción, Universidad de Santiago de Chile).

The ReAK project is being funded by the German Federal Ministry of Education and Research (BMBF) within the scope of the “CLIENT II — International Partnerships for Sustainable Innovations” funding initiative within the framework of the general programme “Research for sustainable development (FONA3).”



Research project ReAK: www.reak.info

Advanced oxidation processes (AOPs) are efficient oxidation processes for the removal of substances from wastewater that are otherwise virtually nondegradable. These processes are generally used to remove long-lasting organic substances such as pharmaceuticals.

Photo: Envirochem AOP unit installed in a plant module for wastewater oxidation using UV and hydrogen peroxide



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