

SAFER FINAL STORAGE OF ARSENIC (SAFSA)

Project leader: Jurate Kumpiene

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All mines or smelters handle elements that are excluded from the main products, such as ore concentrates or smelter products. Arsenic is one of such elements that end up in waste. Due to its toxicity and carcinogenicity, arsenic is among the priority contaminants worldwide and its use in products is highly restricted. Thus, arsenic has little market value and its recovery from waste is not feasible. Arsenic-containing materials are categorized as hazardous and must be managed for the safe and final long-term storage in landfills or deep underground storage, but this is highly challenging since current methods rendering arsenic stable are not fully functioning under such storage (i.e. low redox) conditions.

This project aims at developing a method for the long-lasting stabilization of metallurgical waste with a high arsenic content under low redox conditions. In particular, we attempt to stabilize arsenic by mimicking natural analogies, i.e. the formation of naturally occurring and the most stable arsenic-sulfide minerals. The biogeochemical conditions will be modulated in a way that arsenic is expected to form stable mineral forms, i.e. realgar, orpiment, arsenopyrite that are similar or close to natural minerals of As-sulfides.

The project is closely connected to the CAMM²'s WP5: Environment and is implemented in cooperation between the research groups of Waste Science and Technology and Applied Geochemistry at LTU.