Faculty of Material Sciences and
Material Technologies
Institute for Nonferrous Metallurgy and Purest Materials

TECHNISCHE UNIVERSITÄT BERGAKADEMIE FREIBERG
Die Ressourcenuniversität. Seit 1765.

MASTER THESIS

Tin Residue Valorization, Utilizing Hydrogen as Reducing Agent

Introduction

At INEMET (Institute for Nonferrous Metallurgy and Purest Materials) we are currently investigating different approaches to reduce Tin Residues using green, non-fossil reducing agents. Tin Residue is a byproduct of the secondary Tin production process. It can contain valuable amounts of tin and other valuable metals (e.g., Cu) and when treated correctly, the produced slag can become a valuable base product for cement production.

Tasks

- The candidate (f/m/d) starts with short literature research.
- Cooperation in conducting the reduction experiments in crucibles inside an induction furnace. The use of hydrogen as a reducing agent is foreseen.
- Preparing and evaluating the experiments with the help of a thermodynamic modeling software (Factsage).
- Performing XRF, SEM and possibly XRD analysis of the slag and products.
- Performing IXP and SEM analysis of the produced metallic phase.
- The goal is the creation of an optimal process for the reduction of Tin residues, optimizing conditions such as: temperature, holding time, H_2 : inert gas ratio.

Requirements

- ✓ Basic experience to work in a lab environment, interest to work on high temperature furnaces.
- ✓ Background in in Metallurgy/Material Science/Chemistry/Mineralogy or related.
- ✓ Prior knowledge on working with SEM would be beneficial.
- ✓ High degree of motivation for the topic as well as working as part of a team.
- ✓ **Start Date:** as soon as possible; **Duration:** 6 months (40 h/week)

Benefits

- ❖ Working on a highly actual advanced research project within INEMET
- ❖ Opportunity to gain experiments with Furnaces and Analyzing devices and other equipment

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