

## C17: Selective Agglomeration of Engineered Artificial Minerals (EnAM) in a Suspension of Comminuted Slag

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The aim of the project is to extract selectively valuable minerals (EnAM) by spherical agglomeration in a suspension of a crushed slag phase. The selective agglomeration is based on the controlled use and modification of the wetting properties of suspended particles in the size range  $\leq 20 \mu\text{m}$ . The basis of this process is a three-phase system consisting of two liquid phases with a miscibility gap and a heterogenous solid phase suspended in the continuous phase (water). The second liquid phase, the binding liquid, is dispersed in the continuous phase or added as an emulsion. The binding liquid adheres on particles with better wetting properties, which results in the formation of agglomerates with a typical diameter of 0.2-1 mm. These agglomerates can be easily separated from the remaining suspension by solid liquid separation.

The focus of this project is the systematic modification of the wetting properties and the investigation of interactions between particles and different binding liquids regarding selective agglomeration. In correlation with the selection of suitable binding liquids, the wetting properties will be modified by changing the pH value and by using surface-active substances or complexing agents. The agglomeration process will take place in a rotational rheometer with a stirred vessel consisting of a glass beaker with baffles. For the chemical analysis and thus the evaluation of the selectivity, a spectrometer based on total reflection X-ray fluorescence will be used.

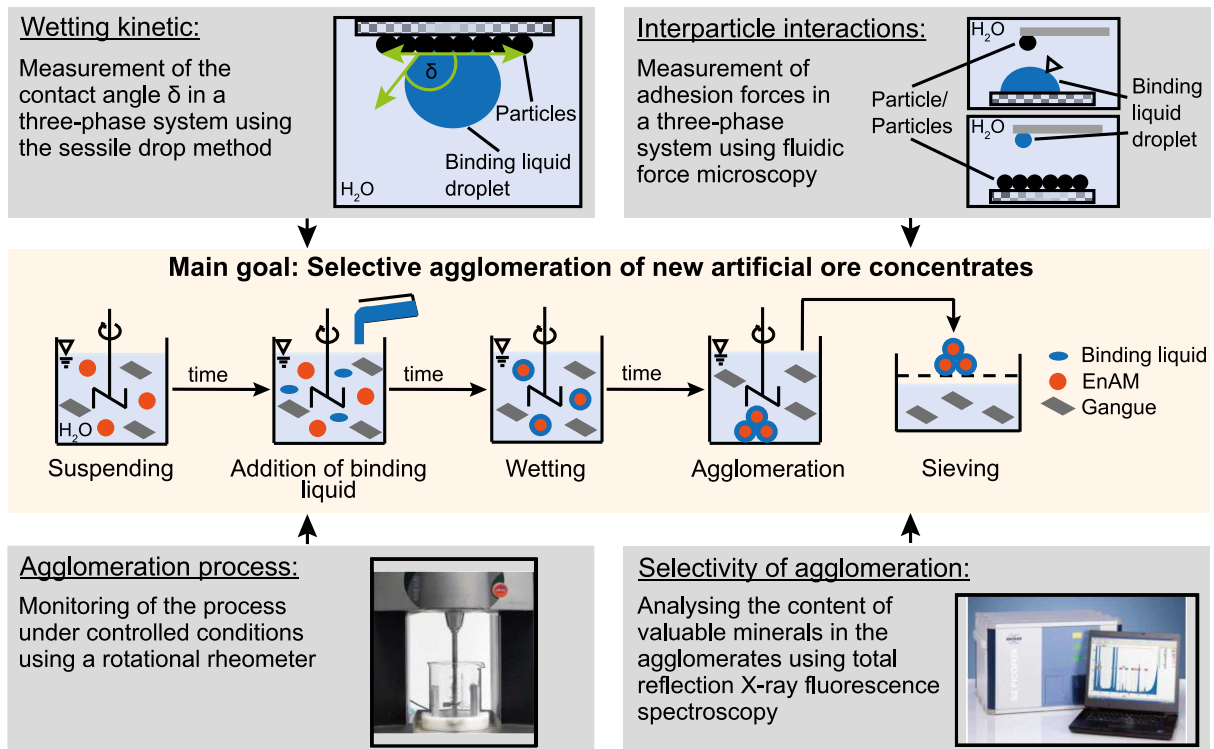


Figure 1: Schematic representation of the work packages.