Goldschmidt 2022 Abstract
https://doi.org/10.46427/gold2022.8913

Localizing Dissolution Rate Spectra

CHANDRA WIDYANANDA WINARDHI, JOSE GODINHO AND JENS GUTZMER

Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institute Freiberg for Resource Technology

Presenting Author: c.winardhi@hzdr.de

Mineral dissolution is a dynamic process that involves reacting a surface with a fluid. Therefore, the kinetics of dissolution depends not only on the solution and the environment (concentration and temperature) but also on the mineral properties (reactive surface area orientation and geometry). Several studies show that the dissolution rate is not a constant value but a spectra that depends on the reactivity of the different types of surface features. However, available experimental evidence comes either from observations from single surface (e.g. view from top) or from flow through in situ studies (where flow affects the observation). In this work the dissolution behavior of galena particles in deep eutectic solvent (DES) is shown using X-Ray Computed Tomography (CT). Two cases were evaluated: 1) only one surface of the particle was reactive and 2) the particle reacts from 5 different directions. The particle was leached in a stirred batch reactor to avoid the effect of directional flow. These are the first result showing the effect of large scale particle geometry in the dissolution rate spectra, which was used to developed a code to localized micron-scale evolution of the surface of a particle of a particle based on neighborhood of each point of the surface.