

# Dissolution kinetics of albite crystals and glass: An experimental comparison

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We study the dissolution kinetics of albite crystals and isochemical glass samples in a flow-through cell. Samples of Amelia Courthouse albite are crystallographically fully ordered and were already used in a series of earlier dissolution studies (e.g., [1] [2]). Therefore, these albite samples provide a basis for a comparison with the structural endmember, i.e., albite glass that we generated by melting and quenching.

Next, we conducted a series of dissolution experiments with one crystal and one glass sample in the same cell under identical conditions. Surface evolution of both materials were quantified over a series of time-steps in a long-term flow-through experiment using atomic force microscopy (AFM) and vertical scanning interferometry (VSI). Surface maps of identical sample positions were collected after each reaction period. Masked surface sections provided a reference height. Height measurements of the reacting surface with respect to the masked surface section revealed information about the surface-normal retreat and, thus, the mean reaction rate. However, the reacting surfaces have different complex topographies and, thus, contributions to the overall rate are heterogeneously distributed. This study provides the prerequisite to investigate the heterogeneity of rate contributors using the concept of rate spectra (Filipescu et al., this volume).

[1] Beig and Luttge (2006), *GCA*, **70**, 1402–1420 [2] Arvidson, Beig and Luttge (2004), *Am Mineral* **89**, 51–56