
Aspects on the Illitization of the Kinnekulle Bentonites

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Abstract: Earlier interpretations of the conversion of the virgin smectite of the Ordovician Kinnekulle K-bentonites into the present mixed-layer illite/smectite imply that it took place through charge increase of the smectite with subsequent uptake and fixation of potassium. Recent analyses show that the layer charge of the smectite component of the I/S is in fact low and they suggest that neoformation of a separate illite phase took place. Pytte's kinetic model gives good agreement with the actual conversion rate for an activation energy of about 25–27 kcal/mole, depending on the adopted rate parameters, temperature history and assumed potassium source. In the Kinnekulle case the rate-controlling factor appears to have been the supply of potassium, which is concluded to have required large-scale, heat-induced groundwater convection.

Key words: Bentonite • Illitization • Smectites

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