

F-OH EXCHANGE IN LAYER SILICATES

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ABSTRACT

An experimental study has been made of the effect of neutral fluoride solutions on typical clay minerals, both at room temperature and elevated temperatures.

The fractionated samples of boehmite, diaspore, kaolinite, chrysotile, muscovite, etc. were equilibrated with neutral NaF solutions over a period of three months. The extent of F-OH exchange was measured by three independent methods: (a) Back-titration of developed alkalinity due to OH liberation, (b) Direct F-analysis, and (c) Infra-red absorption measurements.

Extensive release of OH from the lattice (from 20-50% at between 25° C and 60° C) was found for several common clay minerals. Neither cation content (*e.g.* dioctahedral vs. trioctahedral) nor type of structure (*e.g.* two-layer vs. three-layer) appeared to affect the magnitude of exchange greatly. Definite identification (and rough estimation) of Na_3AlF_6 in the product shows that not all F enters the lattice in all cases.