
The Cryptand [222] for Exchanging Cations of Micas

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Abstract: Cation exchange experiments were carried out on phlogopite, biotite, and muscovite using cryptand [222] as a complexing agent, dioxane as solvent, and Li as the exchanging cation. The results indicate greater than 90% exchange of the analyzed cations K⁺, Rb⁺, and Sr⁺⁺ in phlogopite and biotite after two days. Similar results for the exchange in muscovite are observed but it is apparently slower. The amount of exchange observed for mica depends mainly on pH, time and the exchanging cation at a constant temperature. Residues of the mineral phase were also investigated by X-ray diffraction and a significant change of the interlayer spacing was detected. Some samples of the residue were analyzed for Li content. The compositions of the treated samples were in good agreement with the determined exchange of K⁺.

Key Words: Biotite • Cryptand • Exchange • Lithium • Mica • Muscovite • Phlogopite • Potassium • Rubidium • Strontium

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