
Visible Changes in Macro Mica Particles that Occur with Potassium Depletion*

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Abstract: Mica particles approximately 10 or 25 mm square and 0.5 mm thick were placed in NaCl-NaTPB solutions to make visual observations of the changes that occur in micas when the interlayer K is replaced by Na. Samples of muscovite, biotite, phlogopite, lepidolite, and lepidomelane were used, and the effects of different degradation periods were photographed.

An increase in the thickness of the particles due to basal planes splitting apart was observed with all micas. This exfoliation released interlayer K and in some cases caused the particles to cleave into separate flakes. Lepidomelane particles remained intact despite a 20-fold increase in thickness in 7 days. Even muscovite and lepidolite exfoliated and cleaved, but much longer degradation periods were needed.

There was a distinct change in the color of the dark biotite, phlogopite and lepidomelane particles when K was removed. Therefore, the initial stages of K depletion at holes, scratches, and edges of the particles were easily followed. As the degradation of the mica particles progressed, however, the color of the mica became a less reliable index of the stage of K depletion. Visual evidence of K depletion at the edges of particles was also obtained with muscovite, but not with lepidolite.

Transverse sections of 25-mm particles of K-depleted biotite were photographed to show the edge expansion that occurred when interlayer K was replaced by Na.

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