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# Micaceous Occlusions in Kaolinite Observed by Ultramicrotomy and High Resolution Electron Microscopy

S. Y. Lee, M. L. Jackson\* and J. L. Brown†

Department of Soil Science, University of Wisconsin, Madison, Wisconsin 53706, U.S.A.  
Analytical Instrumentation Laboratories, Engineering Experiment Station, Georgia Institute of Technology, Atlanta, Georgia 30332, U.S.A.

\* Post-Doctoral Associate and Franklin H. King Professor of Soil Science, respectively.

† Doctoral.

**Abstract:** The layer structure of kaolinite from Twiggs, Georgia and fire-clay type kaolinite (Frantex B, from France), particle size separates 2–0.2  $\mu\text{m}$  was studied by high resolution electron microscopy after embedment in Spurr low-viscosity Epoxy media and thin sectioning normal to the (001) planes by an ultramicrotome. Images of the (001) planes (viewed edge-on) of both kaolinites were spaced at 7  $\text{\AA}$  and generally aligned in parallel, with occasional bending into more widely spaced images of about 10  $\text{\AA}$  interval. Some of the 10  $\text{\AA}$  images converged to 7  $\text{\AA}$  at one or both ends, forming ellipse-shaped islands 80 to 130  $\text{\AA}$  thick and 300 to 500  $\text{\AA}$  long. The island areas and interleaved 10  $\text{\AA}$  layers between 7  $\text{\AA}$  layers may represent a residue of incomplete weathering of mica to kaolinite.

The proportions of micaceous occlusions were too small and the layer sequences too irregular to be detected by X-ray diffraction. The lateral continuity of the layers through the 7-10-7  $\text{\AA}$  sequence in a kaolinite particle would partially interrupt or prevent expansion in dimethyl sulfoxide (DMSO) and other kaolinite intercalating media. Discrete mica particles were also observed with parallel images at 10  $\text{\AA}$ , as impurities in both kaolinites. The small K content of the chemical analyses of the kaolinite samples is accounted for as interlayer K, not only in discrete mica particles but also in the micaceous occlusions.

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