
Electron-microscopic and Mössbauer Spectroscopic Studies of Iron-Stained Kaolinite Minerals

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Abstract: An electron-microscopic and Mössbauer spectroscopic study of a range of kaolinites has revealed three distinct types of iron contamination within these minerals: a) Ferric ion may substitute for aluminium and be evenly distributed throughout the lattice, b) Ferric ion may be present as a crystalline coating of goethite, as indicated by lattice-imaging studies, or c) as an amorphous coating. The distribution of the iron in the groups *b* and *c* is non-uniform and is highest at the flake surfaces. Ferrous ion, when detected, is thought to be evenly distributed throughout the lattice. The size of the contaminating goethite crystallites and the observed Mössbauer spectra of these samples suggest that such particles are super-paramagnetic. All kaolinites can be cleaned by acid treatment except those having iron substituting for Al³⁺.

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