
Kaolinite: NMF Intercalates

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Abstract: Bulk and size-fractionated kaolinites from seven localities in Australia as well as the Clay Minerals Society Source Clays Georgia KGa-1 and KGa-2 have been studied by X-ray diffraction (XRD), laser scattering, and electron microscopy in order to understand the variation of particle characteristics across a range of environments and to correlate specific particle characteristics with intercalation behavior. All kaolinites have been intercalated with N-methyl (NMF) after pretreatment with hydrazine hydrate, and the relative efficiency of intercalation has been determined using XRD. Intercalate yields of kaolinite: NMF are consistently low for bulk samples that have a high proportion of small-sized particles (i.e., <0.5 µm) and for biphased kaolinites with a high percentage (>60%) of low-defect phase. In general, particle size appears to be a more significant controlling factor than defect distribution in determining the relative yield of kaolinite: NMF intercalate.

Key Words: Defect distribution • Intercalates • Kaolinite • N-methyl formamide • Particle size

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