
Morphology of Particles in Size-Fractionated Na- Montmorillonites

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Abstract: Electron microscopy of particles in size fractions ($0.5-1.0 \mu$, $0.1-0.5 \mu$, $0.05-0.1 \mu$ and $<0.05 \mu$ e.s.d.) obtained by centrifugation of Na-saturated montmorillonites from Wyoming (two samples); Chambers, Arizona; and Fayette County, Texas, has shown details of particle morphology. The finest fraction of each montmorillonite consists predominantly of very thin, separate flakes whereas all coarser fractions, totalling 80 per cent or more by weight of the samples studied, are composed of microaggregates. For all the samples, preferred orientation is best developed in specimens formed from flakes of the finest fractions. Microaggregates are stable in dilute suspension although they swell to give large interlayer spacings, but can be disrupted into smaller, thinner flakes by ultrasonic vibration. Differences in dispersion behavior between separate flakes and microaggregates are not due to differences in interlayer charge or chemical composition, which are very small between fractions of each sample, but are thought to be due to the interlocking of flakes in microaggregates during crystal growth, which prevents their complete separation in dilute suspension.

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