
Mixed-Layer Kaolinite—Montmorillonite from the Yucatan Peninsula, Mexico*

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Abstract: Clay beds 1– 2 m thick and interbedded with marine limestones probably of early Eocene age are composed of nearly pure mixed-layer kaolinite-montmorillonite. Particle size studies, electron micrographs, X-ray diffraction studies, chemical analyses, cation exchange experiments, DTA, and TGA indicate that clays from three different localities contain roughly equal proportions of randomly interlayered kaolinite and montmorillonite layers. The montmorillonite structural formulas average $K_0.2Na_0.2Ca_0.2Mg_{0.2}(Al_{2.5}Fe_{1.0}^{3+}Mg_{0.5})(Al_{0.75}Si_{7.25})O_{20+}(OH)_{4-}$, with a deficiency of structural (OH) in either the montmorillonite or kaolinite layers. Nonexchangeable K^+ indicates that a few layers are mica-like. Crystals are mostly round plates 1/10 to 1/20 μ across. The feature most diagnostic of the mixed-layer character is an X-ray reflection near 8 Å after heating at 300° C. The clays are inferred to have developed by weathering of volcanic ash and subsequent erosion and deposition in protected nearshore basins.

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