
Crystal Imperfections with Regard to Direction in Kaolinite Mineral

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Abstract: The crystallite sizes in the particles from four fractions of a kaolinite-clay were determined from the broadening of the X-ray diffraction lines. Measurements were made of the 002 and 111 planes whose crystallographic directions correspond to the clay plate thickness and diagonal, respectively. The extent of crystal imperfection was determined by comparing the calculated crystallite size with the mean size based on measurements from electron micrographs. The crystal imperfections were found to be more extensive in the plate diagonal, 111, than in the plate face, 002, directions. Electron micrographs of hydrofluoric acid-etched samples revealed plate-edge and plate-face imperfections. The latter show a regularity suggesting a mosaic-like texture in the plate surface. Surface imperfections probably have significant influence on the dispersion and flocculation behavior of kaolinite.

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