
Electron-Optical Investigations on Montmorillonites—I. Cheto, Camp-Berteaux and Wyoming Montmorillonites

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Abstract: Other layer silicates are consistently present as impurities in natural montmorillonite samples. They have a distinctly different morphology from the common montmorillonite particles. The selected area electron diffraction (SAD) of these impurities display unusually sharp spot patterns with triclinic, monoclinic and hexagonal symmetries. These impurities are most likely micas, which are easily detectable with X-rays in the coarser fractions ($> 10 \mu\text{m}$) of the samples.

The crystal structure model with the space group $C2$ for montmorillonite single layer has an unusual configuration of OH's and vacancies for a dioctahedral layer silicate. Our intensity calculations do not bring a conclusive evidence for distinguishing the two possible space groups $C2$ and $C2/m$ on the observed SAD patterns of montmorillonite.

The SAD of the thin montmorillonite flakes in Cheto, Camp-Berteaux and Wyoming samples display uniform ring, circular arcs and spotty ring patterns, respectively. These patterns indicate different modes of association of crystallites or different arrangements of elementary layers within them.

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