
Illite from the Potsdam Sandstone of New York: A Probable Noncentrosymmetric Mica Structure

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Abstract: Illite from the Potsdam Sandstone (lower Ordovician) of Northwestern New York was studied by powder X-ray diffraction, scanning electron microscopy, and chemically analyzed and dated by the K/Ar method. The texture and ages of 360 and 392 Ma on two samples establish that the mineral is authigenic and relatively uncontaminated by Precambrian detritus. Random powder X-ray diffraction patterns show sharp and relatively intense $02l$ and $11l$ reflections, indicating an ordered structure. Comparisons with calculated patterns demonstrated that the mineral is not the common $1M$ or $2M_1$ polytype. Instead, the experimental pattern is very similar to that of a $3T$ polytype, but it agrees better with the calculated pattern of the octahedral *cis*-vacant, noncentrosymmetric (space group $C2$) structure found by Méring and Oberlin (1967) and Tsipursky and Drits (1984) in smectites, proposed for mica by Drits *et al.* (1984) and found by Zvyagin *et al.* (1985).

Key Words: Illite • Mica • Noncentrosymmetric • Polytype • Powder X-ray diffraction • Space group $C2$

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