Mica Structure and Fibrous Growth of Illite

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Abstract: The relative growth rates of the three joint chains of silica tetrahedra and metal octahedra in the [100], [110] and [110] directions within the mica layer (referring to the 1*M* unit-cell) seem to control the morphology of mica crystallites. Laths and fibers are the products of relatively fast growth along the [100] direction compared to growth along the [110] and [110] directions. The (010) growth front in 1*M* micas with *trans*-octahedral vacancies exposes a pair of reactive OH ions that can form organic or inorganic complexes and ‘ poison ’ the growth on the (010) face.

Authigenic illite fibers in two sandstones with contrasting lithologies are found to have grown on mica or kaolinite cores. Illite fibers appear in single sets or in multiple sets, 120 ° apart. This texture seems to be related to the stacking sequence of the layers in mica or kaolinite in the core of these fibers.

Key Words: Illite Fibers • Illite Laths • Mica Structure

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