Trioctahedral Smectite and Interstratified Chlorite/Smectite in Jurassic Strata of the Connecticut Valley

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Abstract: Trioctahedral smectite and regularly interstratified chlorite/smectite in strata of the East Berlin Formation of the Connecticut Valley are largely restricted to black shale and gray mudstone deposited in alkaline, perennial lakes. The precursor of the mixed-layer clay appears to have been a smectite. Alkaline lake waters and inherited pore waters rich in magnesium favored the transformation of smectite to mixed-layer chlorite/smectite by fixation of brucitic interlayers into the smectite unit structure. Gray mudstones containing the mixed-layer chlorite/smectite are invariably underlain by magnesium-rich black shale—a possible source of Mg for the clay mineral transformations. The black shale is composed predominantly of Mg-rich trioctahedral smectite of probable authigenic origin.

Key Words: Alkaline lake • Chlorite • Interstratification • Magnesium • Mudstone • Shale • Smectite

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