
Textural Transition and Genetic Relationship between Precursor Stevensite and Sepiolite in Lacustrine Sediments (Jbel Rhassoul, Morocco)

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Abstract: In the Tertiary lacustrine sediments of the Jbel Rhassoul (Morocco), stevensite and sepiolite, confined to the dolomitic facies, are commonly mixed at lower parts of the so-called " Formation Intermédiaire" . Transmission electron microscopy (TEM) observations reveal a relation between these 2 magnesian clay minerals. One can observe the different transition steps, from the initial folded layers of stevensite to the fibers emerging from the layers, and finally to the complete replacement of stevensite by sepiolite. That transition can also be observed by scanning electron microscopy (SEM), where the fibers seem to grow at the expense of stevensite. Thermodynamic calculations have been applied to provide geochemical conditions for the formation of sepiolite after stevensite. Early deposition of the " Formation Intermédiaire" occurred under climatic conditions varying between dry and wet. During dry periods, the relative silica enrichment and the pH decrease in the lake water should destabilize stevensite, leading to the formation of sepiolite. Subsequently, a perennial wet climate would lead to the formation of pure stevensite without any trace of sepiolite.

Key Words: Jbel Rhassoul • Sepiolite • Stevensite • Textural Transition • Thermodynamic Calculation

Clays and Clay Minerals; June 1997 v. 45; no. 3; p. 378-389; DOI: [10.1346/CCMN.1997.0450308](https://doi.org/10.1346/CCMN.1997.0450308)

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