
The Formation of Illitic Clays from Kaolinite in KOH Solution from 225° C to 350° C

Huang Wu-Liang

Exxon Production Research Company, P.O. Box 2189 Houston, Texas 77252-2189

Abstract: Kaolinite was converted into illitic clays in a 2.58 M KOH solution in gold capsules using cold-seal pressure vessels at 225° , 250° , 300° , and 350° C and 500 bars. The XRD shows that the major reaction products are illitic clays with no interlayer expandability. The TEM shows that the illitic clays appear mainly platelet-like with a K/Si ratio close to that of muscovite/illite. The extent of the conversion was monitored by measuring the XRD peak ratio of muscovite (illite) and kaolinite in quenched run products. The results reveal that kaolinite converts to muscovite/illite in the KOH solution at an initial rate two to three orders of magnitude faster than that of similar reactions at near-neutral conditions.

Key words: Illite • Illite synthesis • Kaolinite • Kinetics

Clays and Clay Minerals; December 1993 v. 41; no. 6; p. 645-654; DOI: [10.1346/CCMN.1993.0410602](https://doi.org/10.1346/CCMN.1993.0410602)

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