
Experimental Transformation of Kaolinite to Halloysite

Balbir Singh and Ian D. R. Mackinnon

Centre for Microscopy and Microanalysis, The University of Queensland, Brisbane, Qld 4072, Australia

Abstract: A well-characterized kaolinite has been hydrated in order to test the hypothesis that platey kaolinite will roll upon hydration. Kaolinite hydrates are prepared by repeated intercalation of kaolinite with potassium acetate and subsequent washing with water. On hydration, kaolinite plates roll along the major crystallographic directions to form tubes identical to proper tubular halloysite. Most tubes are elongated along the *b* crystallographic axis, while some are elongated along the *a* axis. Overall, the tubes exhibit a range of crystallinity. Well-ordered examples show a 2-layer structure, while poorly ordered tubes show little or no 3-dimensional order. Cross-sectional views of the formed tubes show both smoothly curved layers and planar faces. These characteristics of the experimentally formed tubes are shared by natural halloysites. Therefore, it is proposed that planar kaolinite can transform to tubular halloysite.

Key Words: Halloysite • Hydration • Intercalation • Kaolinite • Rolling • Tetrahedral Rotation

Clays and Clay Minerals; December 1996 v. 44; no. 6; p. 825-834; DOI: [10.1346/CCMN.1996.0440614](https://doi.org/10.1346/CCMN.1996.0440614)

© 1996, The Clay Minerals Society

Clay Minerals Society (www.clays.org)
