
Rehydration of Zn-Al Layered Double Hydroxides

F. Kooli¹, C. Depège², A. Ennaqadi², A. de Roy² and J.P. Besse²

¹ Department of Chemistry, University of Cambridge, Lensfield Road, Cambridge CB2 1EW, United Kingdom

² Laboratoire de Physico-Chimie des Matériaux, URA CNRS 444, Université Blaise Pascal, 63177 Aubière Cedex, France

Abstract: Rehydration is shown to be straightforward for the reconstruction of polyoxometallate-pillared layered double hydroxides. Zn-Al hydrotalcite-like minerals were prepared with Zn/Al ratios of 1 to 5 by coprecipitation at pH 7. Good crystallinity was obtained for samples with Zn/Al ratios above 2. Thermal decomposition was achieved by calcining the samples at 300 to 900 ° C. The calcined samples were exposed to decarbonated water, with or without hydrothermal treatment to evaluate reconstruction of the hydrotalcite-like minerals by rehydration. Restoration of the hydrotalcite-like structure was found to be independent of the Zn/Al ratios for samples calcined between 300 and 400 ° C; however, a second phase, aluminum hydroxide or zinc oxide, was generally detected. A spinel phase, formed during the calcination of samples at temperatures above 600 ° C, inhibited reconstruction of the hydrotalcite-like phase. The rehydrated hydrotalcite-like minerals had Zn/Al ratios close to 2, irrespective of the chemistry of the starting material.

Key Words: Hydrotalcite • Hydrothermal Treatment • Layered Double Hydroxide • Reconstruction

Clays and Clay Minerals; February 1997 v. 45; no. 1; p. 92-98; DOI: [10.1346/CCMN.1997.0450111](https://doi.org/10.1346/CCMN.1997.0450111)

© 1997, The Clay Minerals Society

Clay Minerals Society (www.clays.org)
