

Hydration-induced interpolytype transformations in the bayerite-derived nitrate-intercalated layered double hydroxide of Li and Al

Supreeth Nagendran, Ganga Periyasamy, P. Vishnu Kamath



PII: S0022-4596(18)30299-8  
DOI: <https://doi.org/10.1016/j.jssc.2018.07.016>  
Reference: YJSSC20297

To appear in: *Journal of Solid State Chemistry*

Received date: 5 May 2018  
Revised date: 9 July 2018  
Accepted date: 17 July 2018

Cite this article as: Supreeth Nagendran, Ganga Periyasamy and P. Vishnu Kamath, Hydration-induced interpolytype transformations in the bayerite-derived nitrate-intercalated layered double hydroxide of Li and Al, *Journal of Solid State Chemistry*, <https://doi.org/10.1016/j.jssc.2018.07.016>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Hydration-induced interpolytype transformations in the bayerite-derived nitrate-intercalated layered double hydroxide of Li and Al

Supreeth Nagendran, Ganga Periyasamy and P. Vishnu Kamath\*

*Department of Chemistry, Central College, Bangalore University, Bangalore 560 001, India*

\*Corresponding author. *E-mail address:* vishnukamath8@hotmail.com

## ABSTRACT

The bayerite-derived layered double hydroxide of Li and Al crystallizes in a hexagonal structure (space group  $P\bar{3}1m$ ) on temperature induced dehydration. The metal hydroxide layers are stacked one above another [stacking vector (0, 0, 1)] in this crystal and the nitrate ion is intercalated with its molecular plane parallel to the metal hydroxide layer. On hydration, (i) there is an expansion in the basal spacing, and (ii) a translation of successive metal hydroxide layers by (1/3, 0, 1) relative to one another. Additionally numerous weak reflections emerge in the powder X-ray diffraction pattern possibly signifying a massive change in the packing of atoms in the interlayer. Partial structure refinement using only the major Bragg reflections suggests that the crystal adopts a structure of monoclinic symmetry (space group  $C2/m$ ) with the nitrate ion oriented with its molecular plane perpendicular to the metal hydroxide layer. The complete pattern could be indexed to a cell of orthorhombic symmetry (space group  $P222$ ) but the structure could not be refined for want of a structure model. The absence of a rational relationship between the cell parameters of the orthorhombic and monoclinic cells suggests that the hydrated phase crystallizes in either an incommensurate structure or in an entirely different crystal structure.

Download English Version:

<https://daneshyari.com/en/article/7757618>

Download Persian Version:

<https://daneshyari.com/article/7757618>

[Daneshyari.com](https://daneshyari.com)