15:15	Poster	3

Hydrothermal synthesis of layered double hydroxide-terephthalate intercalation compounds

Jolanta Darul

Adam Mickiewicz University, Faculty of Chemistry, Grunwaldzka 6, Poznań 60-780, Poland

e-mail: jola@amu.edu.pl

Inorganic/organic composite materials composed of Zn-Al layered double hydroxide (Zn-Al LDHs) intercalated with the terephthalate dianion [$C_6H_4(COO^-)_2$ or TA] have been successfully prepared by hydrothermal method and characterized by X-ray diffraction, FTIR spectroscopy and thermal analysis. The aim of the present work is to obtain insight into the nature of LDH materials when the experimental conditions during hydrothermal or thermal treatment are changed. Although the crystals of synthetic hydrotalcites are usually very small, it has been shown to be possible to enlarge the crystal size (and so sharpen the diffraction pattern) by synthesis upon hydrothermal treatment. The solids obtained by this reaction show pure LDH structure with good crystallinity and homogeneity in composition and an extended interlayer region, because of the intercalation of the organic molecules. The structure, orientation and thickness of LDH composites were investigated. At room temperature, X-ray diffraction indicated that the terephthalate anion adopts a vertical orientation (interlayer spacing d_{003}=14.2 Å) between the hydroxide layers. As the time to which the samples have been submitted to a hydrothermal treatment is prolonged, a change in the Zn/Al ratio is observed, together with a more ordered structure of the species existing in the interlayer space. This procedure is a simple way to obtain a high-charge 'hydrotalcite-like' compounds (HTLCs) free of inorganic C. This result adds new flexibility to our ability to synthesize HTLCs and has important implications for synthesis of other layered compounds with oxide or hydroxide structures.

Acknowledgements: This research is partially supported by the Polish Ministry of Science and Higher Education, Grant No. NN204330537.