

Supporting information

A simple and reliable method for determining the delamination degree of nitrate and glycine intercalated LDHs in formamide

Junya Wang,^a Liang Huang,^a Yanshan Gao,^a Ruoyan Yang,^a Zhang Zhang,^a Zhanhu

Guo^b and Qiang Wang^{*,a}

^aCollege of Environmental Science and Engineering, Beijing Forestry University, 35 Qinghua East Road, Haidian District, Beijing 100083, China

^bIntegrated Composites Laboratory, Dan F Smith Department of Chemical Engineering, Lamar University, Beaumont, TX 77710, USA

*Corresponding author:

Professor Qiang Wang,

College of Environmental Science and Engineering, Beijing Forestry University, 35 Qinghua East Road, Haidian District, Beijing 100083, P. R. China

E-mail: qiang.wang.ox@gmail.com; qiangwang@bjfu.edu.cn

Tel: +86 13699130626

1. Experimental section

1.1 Synthesis of Mg₃Al-NO₃ and Mg₃Al-Gly LDHs

A salt solution A (100 mL) containing a mixture of 0.075 mol Mg (NO₃)₂·6H₂O and 0.025 mol Al(NO₃)₃·9H₂O was added drop-wise into a basic solution B (100 mL) containing 0.05 mol Na₂NO₃ (or glycine). The pH value of solution B was kept constant at 10 by the addition of a solution C (50 mL) containing 0.17 mol NaOH. The resulting mixture D was hydrothermally treated at 120 °C overnight. After hydrothermal aging, the sample was filtered and washed with deionized water until pH=7, then dried at 100 °C in an oven

1.2 Delamination of LDHs

For the delamination of LDHs, various amounts of Mg-Al-NO₃ and Mg-Al-Gly LDHs were put into 20 mL formamide, followed by magnetic stirring till no sediment was observed upon standing.

1.3 Synthesis of nanospherical Mg₃Al-CO₃ LDH suspension in water

The nanospherical Mg₃Al-CO₃ LDH suspension in water was synthesized using a modified coprecipitation method. A salt solution A (100 mL) containing a mixture of 0.0075 mol Mg (NO₃)₂·6H₂O and 0.0025 mol Al(NO₃)₃·9H₂O was added drop-wise to a basic solution B (100 mL) containing 0.05 mol Na₂CO₃. The pH of the precipitation solution was kept constant at 12 by adding NaOH solution (3.4 M) drop-wise. The resulting mixture D was aging overnight at room temperature. Then it was filtered by medium speed filter paper, by which a stable LDH suspension in water was obtained.

1.4 Characterization of samples

XRD patterns were recorded on a Shimadzu XRD-6000 instrument in reflection mode with Cu Ka radiation. The accelerating voltage was set at 40 kV with 30 mA current

($\lambda = 1.542\text{\AA}$) at 0.1° s^{-1} from 5 to 65° .

The morphologies of samples were characterized by field emission scanning electron microscope (FESEM, SU-8020). High resolution transmission electron microscopy (HR-TEM) images were obtained on a JEOL 2010, operating at 200 kV. The turbidity of the delaminated LDHs dispersions in formamide was measured using a turbidimeter (TN-100, Eutech Instruments, Singapore).

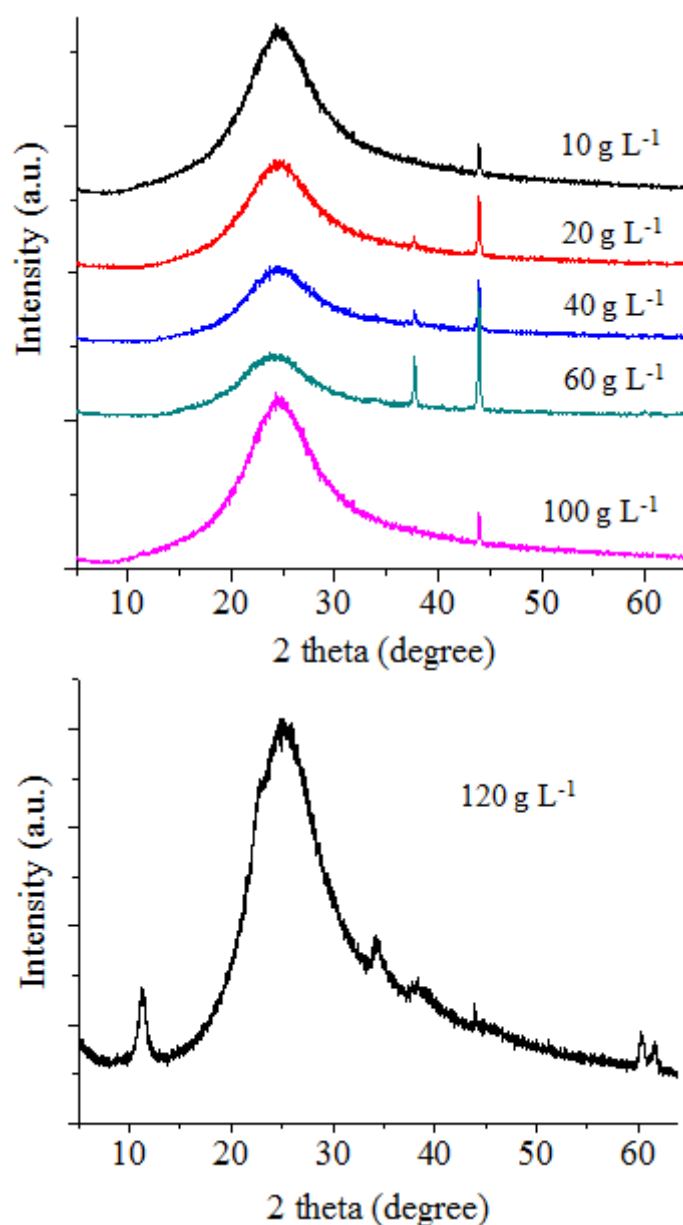


Figure S1. XRD diffraction patterns of delaminated Mg-Al-GLy LDH dispersion gels.