

Preparation of zinc layered hydroxide–chloroacetate nanohybrid using direct reaction method

ABSTRACT

The intercalation of chloroacetic acid (CAA) into the interlayer gallery of zinc layered hydroxide has been achieved via a facile direct reaction method. The nanohybrid synthesised, zinc layered hydroxide-chloroacetate was characterised using Powder X-ray diffraction patterns (PXRD), which demonstrated the progressive evolution of the nanohybrid structure, as the CAA molarity were increased from 0.05 to 0.3 M. Sharp and symmetrical peaks of 0.3 M CAA were observed in the PXRD pattern. The emergence of intercalation peak, with basal spacing of 14.3 Å signifying the success intercalation of chloroacetate anions into the interlayer space of the host. The intercalation was also validated by FTIR spectroscopy and CHNS elemental analyser. The increased thermal stability of zinc layered hydroxide-chloroacetate nanohybrid was confirmed by thermogravimetric analysis.

Keyword: Nanohybrid; Chloroacetate; Zinc layered hydroxide; Intercalation