Intercalation study of curcumin into zinc layered hydroxide

ABSTRACT

Zinc layered hydroxide (ZLH) intercalated with curcumin was successfully prepared by ion exchange method. The synthesised nanocomposite was characterised by Powder X-ray diffraction (PXRD) and Fourier transform infrared spectroscopy (FTIR). The obtained intercalation compound, ZLH-curcumin nanocomposite (ZiCUR), showed a basal spacing of 10.0 Å when 0.01M of curcumin solution was used in the synthesis. The shifting in the stretching frequency of the curcumin anion provides strong evidence that the anion is bonded to the ZLH through electrostatic force. In FTIR, after intercalation, there is a noticeable shift of the O-H stretching vibrational bands. This is due to the formation of strong hydrogen bonds between curcumin and –OH groups in ZLH. Thus, this indicates that curcumin anions are present in the sample and were intercalated between positively charged ZLH layers, as indicated by the characteristics of PXRD pattern.

Keyword: Zinc layered hydroxide; Curcumin; Ion exchange method