22nd Iranian Inorganic Chemistry Conference,
23-25 August, 2023
University of Kurdistan

Intercalation of Mefenamic Acid in Inorganic Nanomatrices with Layered Structure

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In this study, Mefenamic acid was intercalated into Mg-Al layered double hydroxides (LDHs) by ion exchange or coprecipitation methods to obtain mefenamic -LDHs nanohybrids. Mefenamic acid is one of the non-steroidal anti-inflammatory drugs that is used to treat some types of acute and chronic diseases. But its low dissolution rate is a limiting factor for its absorption, so in order to increase the solubility of this material, it can be used to intercalate it between LDH layers. Powder x-ray diffraction (XRD), Fourier transform infrared spectra (FT-IR), and elemental analyses indicate a successful intercalation of Mefenamate anions with a vertical orientation. Intercalation of Mefenamate anions into Mg-Al LDH caused the interlayer spacing of LDH to increase from 0.76 to2.1 nm as determined by x-ray diffraction studies. TG analyses propose that the thermal stability of the intercalated organic anion of mefenamate is largely improved compared to the pure form before intercalation. Furthermore, *in vitro* drug release experiments in pH 7.4 phosphate buffer solution have been investigated. The drug molecules during dissolution were exchanged with anions in the medium, this leading to a slow release, much slower than when the same matrix was used simply mixed with the drug[1-5].

Keywords: Mefenamic acid, Layered Double Hydroxides, co-precipitation, ion exchange, Intercalation

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