

Gallate-Zn-Al-layered double hydroxide as an intercalated compound with new controlled release formulation of anticarcinogenic agent.

Abstract

A new organic-clay material, in which the organic moiety is intercalated into the inorganic interlayer, was prepared using gallate anion (GA) as a guest, and Zn–Al-layered double hydroxide, as clay host. The ion-exchange technique was found to be effective for the intercalation process in the formation of the compound. Although the basal spacings of the LDH and its intercalated product were fairly similar, FTIR, CHNS and TGA/DTG results indicated that the GA was actually intercalated into the interlayer of the host in parallel orientation. The resulting nanostructure material possessed a well ordered layered structure with 42.2% GA loading (w/w). The release of the anion from the interlayer of the intercalated compound was found to be of controlled manner, governed by the first order kinetic and it was also concentration dependent. The material has potential as a nano-storage of anticarcinogenic agent with controlled delivery capability.

Keyword: Nanostructure; Inorganic compound; Chemical synthesis; X-ray diffraction.