

Controlled release of a plant growth regulator, α -naphthaleneacetate from the lamella of Zn–Al-layered double hydroxide nanocomposite

ABSTRACT

Formation of the so-called organic/inorganic nanohybrid material was exploited for the preparation of a controlled release formulation. The inorganic Zn/Al-layered double hydroxide (LDH) was used as a matrix, hosting an active agent or a guest, α -naphthaleneacetate (NAA), a plant growth regulator by self-assembly technique. The reverse process, i.e., the deintercalation or release of the guest, NAA was found to be rapid initially, followed by a more sustained release thereafter and this behavior was dependent on the pH of the release medium, the aqueous solution. The mechanism of release has been interpreted on the basis of the ion-exchange process between the NAA anion intercalated in the lamella host and nitrate or hydroxyl anions in the aqueous solution.

Keyword: Hydrotalcite; Layered double hydroxide; Naphthalene acetic acid; Nanocomposite; Plant growth regulator