Physicochemical study of 3,4-dichlorophenoxyacetic acid intercalated into hydrotalcite-like compound by ion exchanged method

ABSTRACT

The intercalation of herbicide, 3,4-dicholorophenoxyacetic acid (3,4D), into zinc-aluminium-layered double hydroxide (LDH) for the formation of a new nanocomposite ZADX, was accomplished via anion exchange method. Due to the intercalation of 3,4D with LDH interlayer domain, basal spacing expanded from 8.9Å in the ZAL to 17.7-19.0 Å in the ZADX. The percentage loading of 3,4D in the ZADX is 51.4 % (w/w). The FTIR spectra of the nanocomposite shows resemblance peaks of the 3,4D and Zn-Al-layered double hydroxide indicating the inclusion of 3,4D into the layered double hydroxide. Surface area of the resulting nanocomposite increased from 1.3 to 7.14 m2g-1 with the nitrogen adsorption-desorption of type IV.

Keyword: 3,4-dichlorophenoxyaceticacid; Herbicide; Hydrotalcite-like compound; Intercalation