

Synthesis and characterization of Zn-Al layered double hydroxide (LDH) nanocomposite intercalated with sodium dodecyl sulfate (SDS)

ABSTRACT

The co-precipitation method was employed to fabricate Zn/Al-NO₃-LDH in molar ratio, Zn²⁺/Al³⁺= 2 at PH=7. The sodium dodecyl sulfate (SDS) was intercalated to Zn/Al-LDH using coprecipitation method to form a new organic-inorganic nanocomposite (LDH- SDS) with different concentration of SDS solution (0.2M, 0.4M and 0.8M). The structural properties of the resultant nanocomposites were perused using powder X-ray diffraction (PXRD). The UV-VIS- NIR Diffuse reflectance spectroscopy was applied to evaluate the optical band gap energy of LDH and LDH-SDS samples. For LDH-SDS samples the values of Eg1 and Eg2 were observed to increase to around 5.2 eV and 4.1 eV. The electron spin resonance (ESR) spectra of Zn/Al-LDH are comprised of a broad signal with g-factor=2.11875 which can be caused by the existence of nitrate radicals within LDH interlayer, it was obtained up to around g=1.98639 for LDH- SDS samples which can be attributed to the interaction between SO₄²⁻ from DS anion and Al nuclei (5/2) from the layers.

Keyword: Nanocomposite; Layered double hydroxide; Sodium dodecyl sulfate