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 SO4 2- from DS anion and Al nuclei (5/2) from the layers.

Keyword: Nanocomposite; Layered double hydroxide; Sodium dodecyl sulfate