

Synthesis and characterization of (zinc-layered-gallate) nanohybrid using structural memory effect

ABSTRACT

The memory effect of calcined zinc hydroxide nitrate, with gallate anion solutions, was studied. The layered hydroxide salt material, zinc hydroxide nitrate was heat-treated at 150–800 °C. XRD analysis showed the growth of the calcined materials in both thickness and diameter occurring simultaneously with increasing calcination temperature. Surface area analysis confirmed this growth. The rehydration behavior of the calcined material was investigated by placing the material in a solution containing gallate anions. The best result for layered hydroxide salt phase reconstruction was obtained for a sample heated at 500 °C and treated with 0.1 mol L⁻¹ anion. PXRD analysis showed the formation of a layered structure material after rehydration process. FTIR and TG confirmed the formation of the host–guest nanohybrid material produced.

Keyword: Nanostructures; Oxides; Heat treatment; Layered hydroxide salt.