Thermal diffusivity measurement of zinc-aluminum-layered double hydroxide using photoflash technique

ABSTRACT

The photoflash technique has been widely used for measuring thermal diffusivity of various types of materials. In this report thermal diffusivity of Zn-Al layered double hydroxide synthesized at different ratios of Zn to Al composition is presented. The samples were prepared using Zn(NO3)2 and Al(NO3)3 solutions at pH of 10 by drop wise addition of NaOH solution with vigorous stirring under nitrogen atmosphere. Different compositions of Zn to Al molar ratios were obtained by changing the molar ratio of Zn(NO3)2 to Al(NO3)3. The slurry formed was kept at 70ϑC in an oil bath shaker for 18 h, filtered, washed and dried in an oven for 18 h at 70ϑC. A simple photo flash and polyvinlidene diflouride (PVDF) film was used as light source and thermal wave detector, respectively. Thermal diffusivity of Zn-Al layered double hydroxide measure at room temperature was found increase with different compositions for Zn-Al ratio of 3ï 5.

Keyword: PVDF; Thermal diffusivity; Zinc-aluminum layered double hydroxide; Flash technique