PREPARATION AND PHOTOCATALYTIC ACTIVITY OF NANOCOMPOSITES ZnCr-LDH

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Abstract

An increasing interest in the layered double hydroxides (LDH) has been developing because of their multiple applications as basic catalysts, catalyst supports, adsorbents, anion exchangers, enzyme immobilizers and medical oriented products among others. However, the photocatalytic properties of these materials have been mostly ignored. But recently it was found that LDH containing Mg-Zn-Al have semiconducting properties and were able to photocatalytically degrade 2,4-dichlorophenoxyacetic acid and phenol. Other Zn-containing LDH have been also tested as photocatalysts [1]. By a controlled thermal decomposition of LDH containing Zn, the LDHs are transformed into mixed oxides with homogeneous interdispersion of the elements, showing high specific surface areas and high thermal stability. This method can be used for preparation of doped semiconductors, which can be further used as photocatalysts in UV and/or VIS photocatalysis [2]. Prepared materials were characterized by XRD, TG analysis, measurement of adsorption isotherms. Photocatalytic activity of all samples was measured by degradation of Acid Orange 7 and also by degradation of terephthalic acid, which is used for the determination of OH radicals production. It was found that ZnCr-LDH has photocatalytic activity but mixed oxides prepared from this type of LDH have better photoactivity due to the improved crystallinity (temperature of calcination 500°C and higher).

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