

Thermal Transformation of Zn-Bi Double Hydroxide Lamellar in ZnO Doped with Bismuth in Application for Photo Catalysis under Visible Light

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Abstract : The objective of this study is to use a synthetic route of the layered double hydroxide as a method of zinc oxide by doping a transition metal. The material is heat-treated at different temperatures then tested on the photo-fading of acid dye indigo carmine under visible radiation compared with ZnO. The material having a better efficacy was characterized by XRD and thereafter SEM. The result of XRD untreated Bi-Zn-LDH material thermally revealed peaks characteristic lamellar materials. Indeed, the lamellar morphology is very visible, observed by scanning electron microscopy (SEM). Furthermore, the lamellar character partially disappears when the material is treated at 550 °C in a muffle furnace. Thus obtained, a zinc oxide doped with bismuth confirmed by XRD. The photocatalytic efficiency of Bi-ZnO in a visible light of 500 W at 114,6 $\mu\text{W}/\text{cm}^2$ as maximum of irradiance was tested on photo-bleaching of an indigoid dye in comparison with the commercial ZnO. Indeed, a complete discoloration of indigo carmine solution of 16 mg / L was obtained after 40 and 120 minutes of irradiation in the presence of Bi-ZnO and ZnO respectively.

Keywords : photocatalysis, Bi-ZnO-LDH, doping, ZnO

Conference Title : ICEM 2016 : International Conference on Environmental Management

Conference Location : Paris, France

Conference Dates : September 26-27, 2016