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Enhanced Visible-Light Photocatalytic Activity of TiO2 Doped in Degradation of Acid Dye

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Abstract : The objective of this study is based on the synthesis of a new photocatalyst based on TiO2 and its application in the photo-degradation of an acid dye under the visible light. The material obtained was characterized by XRD, BET and UV- vis DRS. The photocatalytic efficiency of the Zn -Fe TiO2 treated at 500°C was tested on the Indigo Carmine under the irradiation of visible light and compared with that of the commercial titanium oxide TiO2-P25 (Degussa). The XRD characterization of the material Zn-Fe-TiO2 (500°C) revealed the presence of the anatase phase and the absence of the Rutile phase in comparison of the TiO2 P25 diffractogram. Characterization by UV-visible diffuse reflection material showed that the Fe-Zn-TiO2 exhibits redshift (move visible) relative to commercial titanium oxide TiO2-P25, this property promises a photocatalytic activity of Zn - Fe- TiO2 under visible light. Indeed, the efficiency of photocatalytic Fe-Zn-TiO2 as a visible light is shown by a complete discoloration of indigo carmine solution of 16 mg/L after 40 minutes, whereas with the P25-TiO2 discoloration is achieved after 90 minutes.

Keywords : POA, heterogeneous photocatalysis, TiO2, doping
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