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Adsorption Study of Methylene Blue And Rhodamine B From Aqueous Solution By Hydrated Amorphous Titanium Dioxide

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ABSTRACT

Adsorption removal of cationic dye Methylene blue (MB) and Xanthene dye Rhodamine B (RhB) from an aqueous solution by using hydrous TiO_2 was investigated at different time intervals. Hydrated titanium dioxide Ha-TiO_2 has been prepared by Hydrolysis of Titanium tetra butoxide with 1:1 aqueous ammonia solution. The calcinated powder showed a particle size in the nm region. The obtained product was characterized by XRD, SEM, TGA, DSC, BET and FTIR techniques. The results showed that, the product was in the form of hydrated amorphous titanium dioxide, $TiO_2 1.06H_2O$ (Ha- TiO_2) and the BET surface area is 125.67m^2/g. The sample as prepared showed excellent ion-exchanger for the adsorption removal of MB and RhB. Ion exchange studies on 50ml aqueous solution containing dye with 100mg of dispersed exchanger indicates adsorption 76.3% of MB and 39.6% of Rh-B in 90 and 120 minutes respectively.

Keywords: Hydrous titanium dioxide; Rhodamine B; Methylene blue; Adsorption; Co precipitation.