

Synthesis of Graphene Oxide/Chitosan Nanocomposite for Methylene Blue Adsorption

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Abstract : In the present study, a graphene oxide/chitosan (GO-CS) composite material was prepared and used as an adsorbent for the removal of methylene blue (MB) from aqueous solution. The synthesized GO-CS adsorbent was characterized by Fourier transform infrared spectroscopy (FT-IR), X-ray diffraction (XRD), scanning electron microscopes (SEM), transmission electron microscopy (TEM), Raman spectroscopy and thermogravimetric analysis (TGA). The removal of MB was conducted in batch mode. The effect of parameters influencing the adsorption of MB such as pH of the solution, initial MB concentration, shaking speed, contact time and adsorbent dosage were studied. The results showed that the GO-CS composite material has high adsorption capacity of 196 mg/g of MB solution at pH 9.0. Further, the adsorption of MB on GO-CS followed pseudo second order kinetics and equilibrium adsorption data well fitted by the Langmuir isotherm model. The study suggests that the GO-CS is a favorable adsorbent for the removal of MB from aqueous solution.

Keywords : Methylene blue, Graphene oxide-chitosan, Isotherms, Kinetics.

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