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**Efficient removal of Chromium(VI) from aqueous solution using chitosan grafted
graphene oxide (CS-GO) nanocomposite**

Melvin S. Samuel^a, Jayanta Bhattacharya^a, Sankalp Raj^a, Needhidasan Santhanam^b, Hemant Singh^a, N. D. Pradeep Singh^{c*}

^a School of Environmental Science and Engineering, Indian Institute of Technology,
Kharagpur, West Bengal - 721302, India.

^b Saveetha School of Engineering, Saveetha University, Chennai, Tamil Nadu
602 105, India

^{*c} Department of Chemistry, Indian Institute of Technology, Kharagpur, West Bengal -
721302, India. Email: ndpradeep@chem.iitkgp.ernet.in.

Abstract

The present study involves the adsorption of hexavalent Chromium(Cr(VI)) using chitosan grafted graphene oxide (CS-GO) nanocomposite in batch mode. The CS-GO nanocomposite material was prepared by ultrasonic irradiation technique. The CS-GO adsorbent was characterized by X-ray diffraction (XRD), Fourier transform infrared (FTIR) spectroscopy, scanning electron microscopy (SEM) and Tunnelling electron microscopy (TEM), followed by Cr(VI) adsorption studies. The adsorption capacity of 104.16 mg/g was achieved at pH 2.0, in the contact time of 420 min. The adsorption process was described by the pseudo second order kinetic and Langmuir isotherm model. The nano-microstructural investigation validates the successful adsorption of Cr(VI) on CS-GO nanocomposite. The CS-GO material is recyclable up to 10 cycles with the minimum loss in adsorption capacity.

Keywords: Chromium(VI), chitosan-graphene oxide, Ultrasonic irradiation, isotherms, kinetics, thermodynamics.

1. Introduction

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