

Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from Wastewater

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Abstract-Reactive dyes which are mainly used for dyeing cotton and other cellulose-based fibers are released in huge quantities into water bodies. They are associated with several harmful effects including allergic dermatoses, respiratory diseases, colonic and rectal cancers, etc. In this paper, we report a novel and facile synthesis of bio-nanocomposite of magnetic guar gum (BMGG) wherein the polymeric network of guar gum is decorated with spinels of magnetic nanoparticles via a simple hydrothermal method which shows promising removal efficiency for reactive dyes. Physicochemical techniques such as FESEM, TEM, EDAX, FTIR, Raman, TGA, VSM, pH_{ZPC}, and XRD have been used for characterizing the as-synthesized nanocomposite. Batch

1. INTRODUCTION

Over the last 10 years, researchers from various domains have been putting in relentless efforts in the field of exploration and design of sustainable materials that can be utilized as adsorbents for the removal of toxic contaminants from wastewater, most importantly synthetic dyes. Among several categories of dyes, being synthesized, Reactive dyes are the ones that are used on an extensive scale. A Reactive dye primarily has chromophores containing an azo or anthraquinone moiety along with a number of other reactive groups