



Synthesis, characterization and evaluation of amphoteric galactomannan derivative for the mitigation of malachite green and Congo red dye from aqueous solution

Deepak Sharma and Pradeep Sharma

Forest Research Institute, India

Abstract

Biopolymeric materials have been utilized for water treatment since ancient times. Consequently, there is a cumulative and persistent interest in the study of novel sustainable, inexpensive and natural biobased alternatives. Amphoteric derivatives of galactomannans are still unexplored and rarely used materials to treat industrial wastes. The study was explored to synthesize and characterize amphoteric derivative of Cassia tora gum, a 1,5 galactomannan for its application as a potential adsorbent for mitigation of cationic (Malachite green) and anionic (Congo red) dyes by applying 'Taguchi design' (L9). The derivative was also studied for the conditioning of water using kaolin suspension. The results signify that the amphoteric derivative (anionic DS ~ 0.52 and cationic DS 0.197) is effective in maximum adsorption of Malachite green (73%) and Congo red (17 %) dyes and as a flocculant at a minimum dose of 10 ppm. The amphoteric derivative was characterized by X-ray-diffraction, TG analysis and spectroscopic techniques.

Biography

Deepak Sharma has completed his PhD from Forest Research Institute Deemed to be University, Dehradun, India. His research interest is Carbohydrate chemistry, their purification, functionalization, and structure characterization by using NMR (1D, 2D) and FT-IR spectroscopic techniques.



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