

Modified sugarcane bagasse for the removal of anionic dyes from aqueous solution

Abstract

Purpose

This paper aims to improve the adsorption capacity of sugarcane bagasse (SCB) as a low-cost, attractive and effective adsorbent for dye removal from wastewater.

Design/methodology/approach

SCB is a cellulosic material; it was chemically modified with compounds containing cationic groups. The adsorption efficiency of unmodified and modified SCB was investigated with anionic dyes by studying various factors that affect modified SCB and adsorption.

Findings

X-ray diffraction, FT-IR spectra and nitrogen content were used to confirm the effect of existence of quaternary ammonium groups on modified SCB. The morphological structure of the modified and unmodified SCB has been demonstrated using electronic scanning microscopy.

Research limitations/implications

The modified SCB was chemically treated by Quat 188, which is commercially available in the solution of 3-chloro-2-hydroxypropyltrimethyl ammonium chloride.

Practical implications

Grafting cationic function groups on the surface of sugarcane by cationization treatment enhances its adsorption efficiency for anionic dyes.

Originality/value

The main value of this research was indicating a clear difference in the appearance of unmodified and modified SCB surfaces. Furthermore, it can be determined that the modified SCB absorbs more of the dyes.