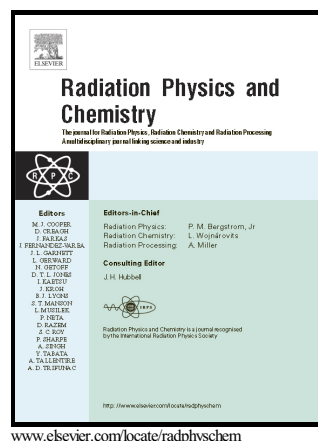


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Mahmoud S. Hassan



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# Removal of reactive dyes from textile wastewater by immobilized chitosan upon grafted Jute fibers with acrylic acid by gamma irradiation

Mahmoud S. Hassan

*Radiation Chemistry Department, National Center for Radiation Research and Technology, Atomic Energy Authority, B.O. Box 29 Nasr City, Cairo, Egypt.*

## Abstract

Jute fibers were grafted with acrylic acid by gamma irradiation technique. Chitosan was immobilized upon the grafted Jute fibers to be used as an adsorbent for waste reactive dye. The treated Jute fibers were characterized by using of Fourier-transform infrared spectroscopy (FTIR), Scanning electron microscopy (SEM) and X-ray diffraction (XRD). The effect of Jute treatment on its thermal stability by using thermogravimetric analysis (TGA) and its mechanical properties were investigated. The adsorption isotherm and the different factors affecting the dye adsorption such as pH and contact time were also studied. It was found that the dye adsorption was enhanced in the low pH range and increased with increasing of the contact time, regardless of temperature change.

**Keywords:** Jute fibers; Acrylic acid; Chitosan; Gamma radiation, Dye adsorption.

## 1. Introduction

Many industries viz. textile, paper, plastics and dyestuffs production consume substantial volume of water and also use chemicals and dyes during manufacturing of their products. It is well known that, the discharging of dyes into the hydrosphere can cause environmental damage which reduces the sunlight penetration due to the undesirable coloring of water (Al-Degs et al., 2004). It also might cause allergic dermatitis and skin irritation if it comes in contact to the skin (Wang et al., 2005).

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Corresponding author. Tel.: +202 22748246; fax: +202 22749298.  
E-mail address: mah5moud@hotmail.com (M. S. Hassan).

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