



## Improvement of the Color Fastness Properties onto Bleached Sulfonated Jute with Direct Dyes

M. A. Salam, R. K. Sheik and F. I. Farouique  
Department of Applied Chemistry & Chemical Technology,  
University of Rajshahi, Rajshahi-6205 Bangladesh

Corresponding author: Dr. Abdus Salam, 3947 N 20<sup>th</sup> St,  
Lincoln, NE 68521 USA. Phone: 402 5706287,  
email: [asalam\\_69@yahoo.com](mailto:asalam_69@yahoo.com)

### ABSTRACT

*Jute fiber has been sulfonated with sodium sulfite in presence of ethylenediamine and bleached with hydrogen peroxide. Bleached sulfonated jute has been dyed with direct dyes (e.g. Direct Yellow 29, Direct Yellow 9, Direct Red 28 and Direct Orange 31). The light and wash fastness, multifabric staining, and breaking strength of dyed bleached sulfonated jute has been studied and compared with that of dyed bleached raw jute. Sulfonation significantly improves light and wash fastness, less staining. On exposure to UV light loss in breaking strength of dyed bleached sulfonated jute with Direct Orange 31 is minimum in comparison with other dyes.*

*Keywords: Sulfonation, bleaching, jute, color fastness, breaking strength*

### INTRODUCTION

Direct dyes are available synthetic dyes amongst the commercial dye range. They are still the brightest and the most brilliant in hue of the synthetic dyes and widely used for the dyeing of cotton, jute, kenaf, flax. Dyes of this type are anionic in character and in general owe their water solubility to the presence of sulfonate groups ( $\text{HSO}_3$ ). However, since jute itself adopts an anionic surface charge in water, these dyes have low intrinsic affinity for the fiber. The repulsive charge between dye and jute fiber can be overcome by adding an electrolyte such as sodium chloride or sodium sulfate, which has the effect of screening the surface charge on the fiber[1]. Jute fiber possesses better affinity than

cotton with direct dyes due to the presence of lignin. But from the practice, it has been observed that the color fastness of jute with direct dyes very poor. A number of attempts have been made to modify the jute fiber using different types of metal salts and vinyl monomers to improve the color fastness properties [2-7]. A few efforts were made to improve the light fastness, which is the major problem for jute when it is exposed to sunlight [8]. But no researcher tried sulfonation of jute fiber for the improvement of the color fastness properties.

In the present investigation an effort was made to improve color fastness properties of direct dyes e.g. Direct Yellow 29, Direct Yellow 9, Direct Red 28 and Direct Orange 31 applied on bleached