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# A STUDY ON THE ADSORPTION OF DYES USING CHITIN BEADS ISOLATED FROM SHRIMP SHELLS

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## ABSTRACT

The art of applying color to fabric was known to mankind in 3500 BC and since then the use of synthetic dyes have provided a wide range of colorfast, bright hues. It is estimated that over  $7 \times 10^5$  tons of synthetic dyes are annually produced worldwide and over 10,000 different dyes and pigments are used industrially. Up to 200,000 tons of these dyes are lost to effluents every year during the dyeing and finishing operations in the textile industries. This accounts to 17 to 20 percent of industrial water pollution as estimated by the World Bank. 72 toxic chemicals have been identified in water solely from textile dyeing, out of which, 30 cannot be removed. About 40 percent of colorants that are used globally contain organically bound chlorine, a known carcinogen. Their toxic nature has become a cause of grave concern to environmentalists. Also, this represents an appalling environmental problem for the clothing and textile manufacturers. Hence, this study aims to treat water from the dyeing unit by a biological adsorption process using Chitin. Chitin, the naturally abundant and renewable polymer, has excellent properties such as biodegradability, biocompatibility, non-toxicity and adsorption. In this study Chitin isolated from shrimp waste was made into beads and used as a packing material in the column. Batch adsorption of a standard dye, Rose Bengal onto chitin beads was carried out by optimizing parameters such as bed height, contact time, dye concentration and pH. The optimized values were 25cm bed height, 0.1% dye concentration, 90min contact time and pH 8. The efficient removal of Rose Bengal dye from the aqueous solution was 87%. Finally the reusability of the chitin beads was also analyzed.

**Keywords:** Chitin, Rose Bengal, Adsorption Isotherm