



## Removal of basic dyes from aqueous environment in single and binary systems by sugarcane bagasse in a fixed-bed column

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### ABSTRACT

The ability of natural sugarcane bagasse in the removal of Basic Blue 3, Methylene Blue and Basic Yellow 11 in both single and binary system from aqueous solutions was studied. Important parameters such as influent concentration, flow rate and sorbent dosage were investigated. Results revealed that the breakthroughs were influent concentration, flow rate and bed height dependent. Increase in influent concentration and flow rate resulted in faster breakthrough while increase in column height yielded longer service time. The sorption data were applied to the Thomas, Belter and Chu, and bed-depth service time (BDST) model. Theoretical breakthrough curves generated using Chu model agreed closely with the experimental values for all the dye systems under studied. In the regeneration study, BB3 dye could be recovered almost quantitatively by eluting the column with 0.1 M HCl and the column could be used repeatedly for at least 3 cycles.

*Keywords:* Sorption; Desorption; Column Regeneration; Column study; Sugarcane bagasse; Basic dyes

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