



## Adsorption dynamics studies of azo dyes removal by biosorbent

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### ABSTRACT

The aim of the study was to evaluate the process of azo dyes sorption onto plant sorbent as an alternative method of water treatment, allowing for the removal of harmful contaminants. The use of chemically modified rye straw to remove of Direct Orange 26 and Reactive Blue 81 from aqueous solutions was proposed in the paper. Experiments were carried out in a laboratory column for different volumetric flow rate, high of bed, and initial concentration of dye. The authors propose an approach completed with an experimental procedure which allows to describe the operation of adsorption columns during the startup, continuous work until breakthrough and to obtain concentration profiles prior to the column regeneration. Calculations were carried out in the Matlab computing environment. Assessment of statistical parameters confirmed that a good fit to experimental data for most of cases was obtained. It was found that that rye straw is an efficient sorbent for the removal of acid dye from water and that it may be used as an alternative biosorbent for the treatment of contaminated water.

*Keywords:* Rye straw; Azo dyes; Biosorption; Packed column; Dynamics modeling

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