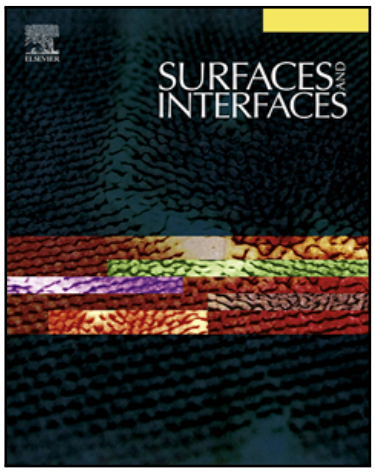

Biosorption of Reactive Red Dye (RRD) on Activated Surface of Banana and Orange Peels: Economical Alternative for Textile Effluent

Fikiru Temesgen , Nigus Gabbiye , Omprakash Sahu

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Biosorption of Reactive Red Dye (RRD) on Activated Surface of Banana and Orange Peels: Economical Alternative for Textile Effluent

Fikiru Temesgen, Nigus Gabbiye and Omprakash Sahu

Faculty of Chemical and Food Engineering, BiT Bahir Dar University Ethiopia

Corresponding author Email:ops0121@gmail.com; Tel:+251940209034

Abstract:

Globally wastewater from textile industry becomes a serious health, safety and environmental issue. Dye containing wastewater is toxic in nature alter the physicochemical charterstices of receiving bodies. In term of cost effective and performance only few methodology are available. On this inspiration low cost and eco-friendly bioadsorbents from agricultural waste were investigated to treat dye contains wastewater. The aim of investigation is to remove the reactive red dye (RRD) from textile industry wastewater by activated orange and banana peel. The textural characterization shows 336.224 m^2/g and 21.456 m^2/g (specific surface area) for orange and banana peels respectively. The experiment conducted in batch mode to optimize the maximum operating condition. The result shows maximum removal efficiency of 89.41% and 70.25% at pH of 4, initial dye concentration of 25mg/L, adsorbent dosage 1g/100mL, and temperature of 30 ^oC on the activate surface of orange and banana peels. The obtained results were well fitted with Langmuir and Freundlich isotherm model and adsorption process follows the pseudo second order model for both adsorbent. Overall both peels have good potential to reduced the dye from wastewater.

Keywords: Bioadsorption; Decolorization; Operating parameters; Reactive red dye; Textile wastewater; Waste peels

Introduction: