

Reduction in color of wastewater from textile industry using biosorbents: Woody saw dusts

A.I. Hettige* and M. I. M. Mowjood¹

Postgraduate Institute of Agriculture
University of Peradeniya
Sri Lanka

ABSTRACT: Textile industries use dye such as Rhodamine B, Brilliant Red and Reactive Orange for the fabrics. Thus the color of the effluent is not within the standard to discharge into the environment. A study was conducted to identify suitable biosorbents and to optimize the conditions for selected biosorbent to reduce the color of treated waste water (TWW) from a textile industry. Sieved and air dried saw dust from Rubber (*H. brasiliensis*), Trincomalee wood (*B. acordifolia*), and Bread fruit (*A. mariannensis*) timber were tested. Rubber saw dust showed a better performance in color removal than the saw dust from Trincomalee wood and Bread fruit. In order to optimize the conditions with the rubber saw dust, color removal efficiency of TWW was measured at different pH, saw dust amount, initial dye concentration and different contact times. Sorption data was modeled by Langmuir and Freundlich adsorption isotherms for each dye, Rhodamine B, Brilliant Red, Reactive Orange. Results showed that the best performances of adsorption of dye into Rubber saw dust was obtained under pH 2 at 5 g/l saw dust dosage with 6 minutes contact time up to 0.2 ml of 0.5 M dye concentration. Based on the correlation efficiencies, sorptions of acidic dye (Brilliant Red) and anionic reactive dye (Reactive Orange) were followed the Langmuir isotherm. Sorption of cationic dye Rhodamine B was better represented by the Freundlich model. It is recommended to use the saw dust of rubber to remove the color in wastewater in acidic condition and neutralize the effluent before discharge to the environment.

Keywords: Textile industry, wastewater, biosorbent, saw dust, colour

¹ Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya, Peradeniya,

* Corresponding author: amali.hettige@gmail.com