

Removal of Reactive Black 5 Using Activated Carbon Produced From Sawdust and Rice Husks - An Effective Way of Effluent Treatment

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The textile industry utilizes various chemicals and large amount of water during the production process. The water is mainly used in the dyeing process and rinsing of the final products. The effluents released during this process contains large amount of dyes and chemicals which affect the ecosystem. Commercial activated carbon has been used for the removal of dyestuffs from dyeing industry effluents. Aim of the current study was to prepare low cost industrial grade activated charcoal using readily available waste materials and study their colour removal efficiencies. The possible utilization of activated rice husk and saw dust carbon as the adsorbents for the removal of Reactive Black 5 dye from aqueous solutions has been investigated. Rice husk and sawdust activated carbon were prepared by H_3PO_4 activation followed by carbonization. The colour removal efficiency of activated saw dust (PASD AC) and rice husks (PARH AC) has been investigated using parameters such as adsorbent dosage, initial dye concentration and reaction time. After 2.5 hour stirring at room temperature, PASD AC decolourized more than 90 % of the dye with 0.2 g/100 mL adsorbent concentration. Percent colour reduction was increased from 53 % to 99 % for the PASD AC and 9 % to 84 % for PARH AC when the activated carbon amount changed from 0.05g to 0.5 g at 6 h stirring time. Adsorption by PASD AC and PARH AC were well fitted to the Langmuir isotherm with the correlation coefficients (R^2) of 0.9961 and 0.959 respectively. Iodine number of PASD AC and PARH AC were obtained as 922 mg/g and 280 mg/g respectively. According to the results, both activated carbons may provide promising solution for the removal of Reactive Black 5 dye from textile effluents.

Keywords: *Reactive Black 5, Rice husk, sawdust, activated carbon, adsorption*

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