

Physicochemical treatment of synthetic textile wastewater containing reactive black 5

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The colour removal ability of two physicochemical methods, adsorption and Fenton oxidation to decolourize synthetic textile wastewater containing reactive black 5 dye was investigated. Phosphoric acid activated saw dust and rice husk carbon were prepared by using simple methods. Both types of activated carbon showed more than 90% colour reduction at the dosage of 0.1 g of activated carbon per 100 cm³ of wastewater at a 2.5 hour stirring time. Percent colour reduction was increased with increasing the amount of both H₃PO₄ activated saw dust and rice husk carbon and the contact time. Percent colour reduction was increased from 30% to 90% when the adsorbent dosages were increased from 0.025 to 0.1 g. When the H₂O₂ dosage was changed from 0.25 to 2 mM, the percentage colour reduction was increased from 20% to 86% at pH 3 at a constant Fe²⁺ concentration of 0.5 mM. When the Fe²⁺ concentration was changed from 0.01 to 0.1 mM while keeping the H₂O₂ concentration at 2.0 mM, the percentage colour reduction was increased from 17% to 81%. According to the results of this study, both adsorption onto activated carbon and the Fenton oxidation may provide promising solution for the removal of Reactive Black 5 dye from textile effluents economically.

Keywords: Reactive Black 5, adsorption, Fenton oxidation, wastewater

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