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## **Treatment of textile effluents using a combination of chemical/physicochemical processes**

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This study was aimed to find low cost efficient treatment technique to treat highly polluted textile dyeing waste-water. Waste-water collected from a local textile dyeing industry was subjected to coagulation, Fenton oxidation, and adsorption methods. Initial characterization of waste water was performed using standard methods. Initial COD and BOD<sub>5</sub> of untreated waste water were 1441 ppm and 223 ppm respectively. The waste water is not suitable for biological aeration treatment due to low BOD/COD ratio. The waste water is not suitable for discharge into inland water bodies due to noncompliance of water quality parameters prescribed by the Central Environmental Authority Sri Lanka. Coagulation was carried out using Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> as the coagulant. Minimum effective dose of Al<sup>3+</sup> was 300 ppm and 54% COD reduction was achieved at pH 9 for the selected samples. The raw wastewater treated by the Fenton oxidation using 0.33 g/L H<sub>2</sub>O<sub>2</sub> and 1.90 g/L FeSO<sub>4</sub> resulted 85% COD reduction. Use of Fenton oxidation as a post-treatment after coagulation with Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>, the COD reduction was enhanced to 97%. Adsorption studies using commercially available activated charcoal and charcoal prepared by rice husks resulted 43% COD reduction when the adsorbent dose is 1 g/L. UV-Vis spectroscopic data shows that the adsorption on to charcoal and coagulation is quite efficient in waste water decolouration. Based on the COD reduction the combined treatment of coagulation and Fenton oxidation of waste water can be used to achieve the quality standards prescribed by the central environmental authority, Sri Lanka.

**Key words:** Waste treatment, Coagulation, Fenton oxidation, adsorption

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