

## **Treatment of highly coloured textile dyeing waste water by Fenton and photo Fenton processes**

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As textile industry in Sri Lanka generates large quantities of highly coloured wastewater from various steps of dyeing processes, there is a pressing need for an efficient waste water treatment method for the decolouration of effluents before discharging them into inland water bodies. Treatment of textile dyeing waste water using biological methods is not possible as the BOD<sub>5</sub>/COD ratio is low (0.15). Advanced oxidation processes are potentially feasible options for treatment of these wastewaters. In the present study, the treatment of textile dyeing wastewater was performed using Fenton's oxidation process. Fenton's process under acidic conditions, a Fe<sup>2+</sup>/H<sub>2</sub>O<sub>2</sub> mixture produces hydroxyl radicals in a very cost-effective manner. The raw waste water and waste water treated by conventional treatments (coagulation) were tested to find the optimum reaction conditions. Photo Fenton's process was performed under strong Sunlight conditions for 2-3 hours. The raw wastewater treated by Fenton's process exhibited COD and colour removal of 77 % and ~99 %, respectively. Using Fenton's oxidation as a post-treatment method for the treated textile waste water by conventional methods resulted COD and colour removal efficiencies of 78 % and ~99 %, respectively. The raw wastewater treated by Photo Fenton's process exhibited COD and colour removal of 81 % and ~99 %, respectively. Using Photo Fenton's oxidation as a post-treatment method for the treated textile waste water by conventional methods resulted COD and colour removal efficiencies of 88 % and ~99 %, respectively. The maximum colour removal and COD reduction were observed at a Fe<sup>2+</sup> dose of 0.17 g/L and H<sub>2</sub>O<sub>2</sub> dose of 1.0 g/L.

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