

Contribution of Electrochemical Treatment in Treating Textile Dye Wastewater

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Abstract : The introduction of more stringent pollution regulations, in relation to financial and social pressures for sustainable development, has pressed toward limiting the volumes of industrial and domestic effluents discharged into the environment-as well as to increase the efforts within research and development of new or more efficient wastewater treatment technologies. Considering both discharge volume and effluent composition, wastewater generated by the textile industry is rated as the most polluting among all industrial sectors. The pollution load is mainly due to spent dye baths, which are composed of unreacted dyes, dispersing agents, surfactants, salts and organics. In the present investigation, the textile dye wastewater was characterized by high colour, chemical oxygen demand (COD), total dissolved solids (TDS) and pH. Electrochemical oxidation process for four plate electrodes was carried out at five different current intensities, out of which 0.14A has achieved maximum percentage removal of COD with 75% and 83% of colour. The COD removal rate in kg COD/h/m² decreases with increase in the current intensity. The energy consumption increases with increase in the current intensity. Hence, textile dye wastewater can be effectively pre-treated by electrochemical oxidation method where the process limits objectionable colour while leaving the COD associated with organics left for natural degradation thus causing a sustainable reduction in pollution load.

Keywords : electrochemical treatment, COD, colour, environmental engineering

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