

Waste Water Treatment by Catalytic Reduction using TiO₂/Solar Radiation

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Abstract: *The color produced by dyes in water makes it aesthetically unpleasant & can acute or chronic effects on exposed organisms which depend on the concentration of the dye and the exposed time. Many dyes are considered to be toxic and even carcinogenic. Textile industries processes are most industrial that release colored wastewater containing dye that become major environmental concern. Photocatalytic Oxidation by ZnO/UV, TiO₂/UV, TiO₂/H₂O₂/ UV and solar irradiation are effective processes to be used for removal of acidic, basic and color dyes from Wastewater. We choose the photocatalytic Oxidation by TiO₂/Solar Radiation for degradation of phenolic red dyes from Wastewater. The factors affecting on rate of reductions of dyes are reaction time, concentrations of dyes and catalyst amount. This process can be conducted under room conditions and organic pollutants can be completely decomposed into CO₂ and H₂O. The % reduction of dyes for sample 5 ppm concentration with various contact time 30, 60, 90, 120, 150 and 180 mins. respectively. The maximum dyes reduction at 180 mins. which is 80.48 % and for 150 mins. is 77 %. So there is no large difference between these two values so we can consider optimum time for dyes reduction is between 150 mins. to 180 mins. The % reduction of dyes for various concentration values 5, 10, 15, 20 and 25 ppm. The maximum dyes reduction at 5 ppm which is 80.32 % for 180 mins. As concentration of dyes in wastewater increase the rate of reduction decrease. The concentration of dyes in wastewater be the important parameter that impact on the rate of reduction of dyes from the wastewater. The amount of catalyst (TiO₂) use for treatment is fixed which is 5-6 gm/l using solar radiation as light source.*

Keywords: Waste Water Treatment, Textile Dyes, Catalytic Reduction, Photocatalytic Reduction

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