

**COMPARATIVE STUDY OF PHOTODEGRADATION OF ORANGE  
BY SOLAR AND FENTON PROCESS**

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**JANUARY 2017**

## ABSTRACT

### COMPARATIVE STUDY OF PHOTODEGRADATION OF ORANGE G BY SOLAR AND FENTON PROCESS

Wastewater is exhausted in large volume every year due to the processes of textile industries such as dyeing and finishing processes. Nowadays, more than 50% of dyes used in textile industry are Azo-based dyes. Inorganic salts improve the coloration of the dye, which enhances the pollution load of wastewater from textile industries. Degradation of the reactive textile dye Orange Gelb (OG) was studied using Fenton's Reagent of Advanced Oxidation Processes (AOPs) and solar photo catalytic by  $\text{TiO}_2$ . A laboratory set-up was designed to evaluate the effectiveness for both treatment. The initial concentration of OG in the reaction was 5 ppm. The effects of irradiation time and the condition of pH dye and concentrations of catalyst ( $\text{TiO}_2$ ,  $\text{H}_2\text{O}_2$  and  $\text{FeSO}_4$ ) on the degree of degradation efficiency were studied. The results indicated that photo-Fenton's process is more effective than solar photo degradation by  $\text{TiO}_2$ . The degradation effectiveness of Fenton's procedure was up to 79.22% in 2 hour rate at pH 3 and in  $3.1 \times 10^{-2}$  M, while the degradation efficiency of  $\text{TiO}_2$  was just up 19.75% at pH6 and in 5 ppm. The degradation effectiveness of Fenton process increased as the concentration of OG dye decreased, the concentration of  $\text{H}_2\text{O}_2$  increased, concentration of  $\text{FeSO}_4$  increased and pH value get decreased which is in more acidic. While for photo degradation for  $\text{TiO}_2$ , the best degradation happened when  $\text{TiO}_2$  concentration increased, concentration of OG dye decreased, and ph value increased.

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