

**COMPARISON STUDY OF ADVANCES OXIDATION PROCESS
(AOP'S) TECHNIQUES IN THE DEGRADATION OF AZO DYE**

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ABSTRACT

COMPARISON STUDY OF ADVANCES OXIDATION PROCESS (AOP'S) TECHNIQUES IN THE DEGRADATION OF AZO DYE

Waste water treatment is the major problems faced by textile industry as they produce large volumes of wastewater during dyeing and finishing process. This problem give potential impact to human health hazard and a threat to aquatic life. Advanced Oxidation Process (AOP) have been studied and chosen in this study consists of combination of $\text{H}_2\text{O}_2/\text{UV}$. Photocatalytic activity of $\text{Cu}^{2+}/\text{H}_2\text{O}_2/\text{UV}$ on degradation of Congo Red (CR) dye and the optimum condition of degradation process based on different experiment conditions which are the concentration of CR used, the concentration of hydrogen peroxide (H_2O_2), the concentration of CuSO_4 as catalyst in Fenton reagent, the pH value of CuSO_4 , the mass of TiO_2 and the pH value of TiO_2 mass were studied. Besides, the degradation efficiency of CR dye using Fenton reagent and TiO_2 was compared. The result indicated that the photodegradation of CR solution are more effective in Fenton reagent process than TiO_2 at pH 3. The result showed for degradation of CR solution in Fenton reagent was 99.32 % and for H_2O_2 concentration was at 77.16 %. As for the TiO_2 , the result showed less efficiency of degradation of CR dye solution than Fenton reagent. The higher percentage degradation of CR dye was at 0.32 g of TiO_2 dose and at pH 3. Lastly, the effective methods for pollutant removal was in Fenton reagent due to the addition of the catalyst CuSO_4 , where the Cu^{2+} ion will undergo reduction under the ultraviolet (UV) lamp and through the photolysis of the H_2O_2 itself. Study found that Fenton process at optimum condition concentration CuSO_4 was the best.