

**DEGRADATION OF AZO DYES IN AQUEOUS SOLUTION BY
USING FENTON PROCESS AND TiO₂ AS A CATALYST**

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ABSTRACT

DEGRADATION OF AZO DYES IN AQUEOUS SOLUTION BY USING FENTON PROCESS AND TiO₂ AS A CATALYST

Releasing of dyes to the environment that caused major pollutant in wastewater usually comes from textile industries. Most of dye used was azo dyes. Degradation of azo dyes by using Fenton process and TiO₂ catalyst was ascertained. The type azo dyes that have been used in this study was Congo red. The sample was tested under UV light and the reaction time in this experiment was conducted for 90 minutes with 15 minutes time interval. The rate degradation of dye was detected by UV-Vis spectrophotometry. The effect of several parameters in this degradation process such as the concentration of FeSO₄.7H₂O as a catalyst in Fenton process, the concentration of hydrogen peroxides (H₂O₂), mass of TiO₂ and value of pH of the dye solution were investigated. The initial Congo red concentration for both Fenton process and TiO₂ catalyst in this experiment was 5 ppm. The ratio of Fe²⁺/H₂O₂ is found equal to 1:4 to give the best result for the degradation rate. The optimum condition of Fenton process was 0.05 M Fe²⁺ ions and 0.2 M H₂O₂ and results 99.92% degradation rate. For TiO₂, 0.1999 g of TiO₂ dose was the optimum condition in this process which results 99.32% degradation rate after 90 minutes reaction time. The best operation condition for both Fenton reagent and TiO₂ catalyst was obtained at pH 3. The results showed that the degradation of Congo red was effective in Fenton process compared to TiO₂.