Effect of Operating Parameters on Degradation of Eriochrome black T Dye

Abstract- Of the effect, the process parameters on photocatalytic degradation Eriochrome black T (EBT) dye has been degraded in a batch reactor under UV light in heterogeneous slurry utilizing various concentrations of two semiconductors commercial catalysts (Titanium dioxide and Zinc Oxide). The parameter has been studied (catalyst type, catalyst concentration, pH of dye solution and initial dye concentration). The results showed that the best dose of TiO$_2$ and ZnO are 1.5 and 1 g/l respectively and the optimum pH (6 and 11) using TiO$_2$ and ZnO respectively. Moreover, the comparative assessment of the photocatalytic efficiency was made for different photocatalytic powder. It was noticed that the best photocatalytic efficiency as ZnO > TiO$_2$. The investigational results were also assessed in expressions of chemical oxygen demand (COD) and color reductions to study treatment efficiency. Maximum COD removed was observed to be around 95%. The decolorization and the oxidation efficiencies could achieve 95% and 88% for ZnO and TiO$_2$ respectively at the optimum conditions for both catalysts (30 ppm Eriochrome black T dye solution).

Keywords- Photocatalytic Degradation, Wastewater Treatment, Eriochrome Black T dye, Advanced Oxidation Process