

Photocatalytic Degradation of Phenol by Fe-Doped TiO₂ under Solar Simulated Light

Authors : Mohamed Gar Alalm, Shinichi Ookawara, Ahmed Tawfik

Abstract : In the present work, photocatalytic oxidation of phenol by iron (Fe²⁺) doped titanium dioxide (TiO₂) was studied. The source of irradiation was solar simulated light under measured UV flux. The effect of light intensity, pH, catalyst loading, and initial concentration of phenol were investigated. The maximum removal of phenol at optimum conditions was 78%. The optimum pH was 5.3. The most effective degradation occurred when the catalyst dosage was 600 mg/L. increasing the initial concentration of phenol decreased the degradation efficiency due to the deactivation of active sites by additional intermediates. Phenol photocatalytic degradation moderately fitted to the pseudo-first order kinetic equation approximated from Langmuir-Hinshelwood model.

Keywords : phenol, photocatalytic, solar, titanium dioxide

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