

عنوان مقاله:

Efficiency of Photo-Fenton Process in Degradation of 2-Chlorophenol

محل انتشار:

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خلاصه مقاله:

Background & Aims of the Study: Phenolic compounds have been extensively used in industries for applications such as petrochemical, oil refineries, papers, plastics, steel, pharmaceuticals, textiles, coal conversion, and so on. Specified amounts of Phenolic compounds are lost in the process of their manufacturing and utilization and often cause environmental pollution problems. So, removal of these compounds from industrial wastewaters is necessary. The aim of this paper is the photo-degradation of environmental pollutant 2-Chlorophenol (2-CP) using the photo-Fenton process which was used a photo reactor for photo-catalytic degradation of 2-CP in aqueous solution. **Materials & Methods:** This is an experimental study on a laboratory scale. Fe²⁺ ions as a homogeneous catalyst applied for the degradation of 2-CP in aqueous solution. The study was performed on synthetic wastewaters that contain 2-CP pollutant. The effect of operational parameters such as: pH, initial concentration Fe²⁺, H₂O₂ concentration and temperature were studied. The effect of UV irradiation, UV/H₂O₂ and UV/Fe²⁺/H₂O₂ on photo-catalytic degradation of 2-CP were studied. The reaction kinetic was studied. In this paper, optimum conditions were determined for the photo-catalytic degradation of 2-CP using a factor at the time method. **Results:** The optimal conditions for this reaction were obtained at pH of 6, initial concentration Fe²⁺ at 20 ppm, H₂O₂ concentration at 14 ppm and temperature at 45 °C. A first order reaction with rate constant (k=0.0375 min⁻¹) was observed for the photo-catalytic degradation reaction. These experiments demonstrated that UV radiation, Fe²⁺ ions and H₂O₂ oxidation process were needed for the effective degradation of 2-CP. **Conclusion:** The results showed that the photo-Fenton process can be a suitable alternative for the removal of phenolic compounds from wastewaters.

کلمات کلیدی:

Photo-Fenton process, Kinetic, 2-CP, Photo-degradation, Reactor, Iran

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