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عنوان مقاله:

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

محل انتشار: مجله آرشیو علوم بهداشتی, دوره 6, شماره 4 (سال: 1396)

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خلاصه مقاله:

Background & Aims of the Study: Phenolic compounds have been extensively used inindustries for applications such as petrochemical, oil refineries, papers, plastics, steel, pharmaceuticals, textiles, coal conversion, and so on. Specified amounts of Phenolic compoundsare lost in the process of their manufacturing and utilization and often cause environmentalpollution problems. So, removal these compounds of industrial wastewaters are necessary. Theaim of this paper, is the photo-degradation environmental pollutant 2-Chlorophenol (2-CP) usingphoto-Fenton process which was used a photo reactor for photo-catalytic degradation of 2-CP inaqueous solution. Materials & Methods: This is an experimental study on a laboratory scale. Fe2+ ions as ahomogeneous catalyst applied for the degradation of 2-CP in aqueous solution. The study wasperformed on synthetic wastewaters that contain 2-CP pollutant. The effect of operationalparameters such as: pH, initial concentration Fe2+, H2O2 concentration and temperature werestudied. The effect of UV irradiation, UV/H2O2 and UV/Fe2+/H2O2 on photo-catalyticdegradation 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 timemethod. Results: The optimal conditions for this reaction were obtained at pH of 6, initial concentrationFe2+ at 20 ppm, H2O2 concentration at 14 ppm and temperature at 45 °C. A first order reactionwith 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 wereneeded for the effective degradation of 2-CP.Conclusion: The results showed that the photo-Fenton process can be suitable alternative toremoval phenolic .compounds from wastewaters

كلمات كليدى:

Photo-Fenton processKinetic2-CPPhoto-degradationReactorIran

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