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### ULTRASONIC DEGRADATION OF PHENOL AND DETERMINATION OF THE OXIDATION BY-PRODUCTS TOXICITY

A. Maleki, A. H. Mahvi, F. Vaezi R. Nabizadeh

#### Abstract:

Phenol is a potential hazard to human health and the environment. The sonochemical degradation of phenol in aqueous solution was investigated by use of a 35 kHz bath sonicator. Experiments were performed at initial phenol concentrations varying from 1 to 100 mg/L. The effects of parameters such as pH and initial phenol concentration on the sonochemical degradation and bioassay test have been studied. The results of the study showed that the ultrasonic phenol degradation increased with decreasing the pH values and phenol concentration. But the rates of phenol degradation under different conditions had always been quite low. It was found that the rate of ultrasonic phenol degradation was first high but it was later substantially reduced and the experimental data fitted well with first order reaction rate equation. Bioassay tests showed that phenol was toxic to *Daphnia magna* and so resulted in quite low LC50 values. Comparison of toxicity units (TU) of phenol and the effluent flow showed that TU value for effluent was 1.65 times lower than that obtained for phenol. Thus, sonication was able to eliminate the toxicity of by-products which were formed during the degradation of phenol.

#### Keywords:

sonochemistry

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