

A STUDY ON THE REDUCTIVE DECHLORINATION OF CHLOROFORM WITH NANO Fe/Cu BIMETALLIC PARTICLES IN AQUEOUS SOLUTION

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Abstract:

In this work, nano-Fe/Cu bimetallic particles are synthesized and used to reduce chloroform to methane in aqueous solution. The synthesized particles are characterized by X ray diffraction (XRD) pattern, Transmission electron microscopy (TEM) images and energy dispersive X ray (EDX) analysis. Such key parameters on the reduction of chloroform as pH, nano-Fe/Cu dosage, treatment time have been investigated. Closed batch experiments have been conducted for this investigation. Experimental results show that the de-chlorination of 50 mL of 20 ppm chloroform aqueous solution has the highest degradation efficiency of 88.93% under the experimental conditions such as pH = 3, reaction time of 30 minutes and nano-Fe/Cu dosage of 0.05 gram. GC-MS analysis for a 20 ppm chloroform aqueous solution before and after treatment has shown that there is no formation of such products containing chlorine as CH_2Cl_2 and CH_3Cl .

Key words: Nano-Fe/Cu; Bimetallic particles; Chloroform; De-chlorination; Degradation; Aqueous solution.