



WET HYDROGEN PEROXIDE CATALYTIC OXIDATION OF PARA-CHLOROPHENOL OVER CLAY BASED CATALYSTS

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Abstract

This study presents an evaluation of the catalytic performances of Fe containing clay-based catalysts for the wet hydrogen peroxide catalytic oxidation (WHPCO) of 4-chlorophenol (4-CP) aqueous wastes. The catalysts were prepared by well-established techniques, their properties being determined by DRX, BET and chemical analysis techniques. All the tests were performed on a laboratory scale set-up. The ion-exchanged clays were the most active catalysts (100 % 4-CP and 84 % COD removal for Fe-Mt) but are characterized by a high leaching of iron from the structure. The mixed Al-Fe oxide PILC displayed a good catalytic activity (100 % 4-CP and 43 % COD removal) and negligible leaching (< 0.1 %) and was selected for detailed studies. Important factors affecting catalyst activity were studied, i.e. the effect of pH, temperature, catalyst concentration and the stability of the catalyst. The experimental results indicate that the use of this catalyst allows a total elimination of phenol and a significant removal of chemical oxygen demand, without significant leaching of Fe ions, this process being a promising advanced wastewater treatment technique for agro-food and industrial effluents.

Key words: chlorophenols, wet hydrogen peroxide catalytic oxidation, Fenton, pillared clays

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