

Degradation of Chlorpyrifos Pesticide in Aqueous Solution and Chemical Oxygen Demand from Real Effluent with Hydrodynamic Cavitation Approach

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Abstract : Use of Pesticides is vital in attaining food security and protection from harmful pests and insects in living environment. Chlorpyrifos, an organophosphate pesticide is widely used worldwide for various purposes. Due to its wide use and applications, its residues are found in environmental matrices and persist in nature for long duration of time. This has an adverse effect on human, aquatic and living bodies. Use of different methodologies is need of an hour to treat such type of recalcitrant compound. The paper focuses on Hydrodynamic Cavitation (HC), a hybrid Advanced Oxidation Potential (AOP) method to degrade Chlorpyrifos in aqueous water. Obtained results show that optimum inlet pressure of 5 bars gave maximum degradation of 99.25% for lower concentration and 87.14% for higher concentration Chlorpyrifos solution in 1 hour treatment time. Also, with known initial concentrations, comparing treatment time with optimum pressure of 5 bars, degradation efficiency increases with Hydrodynamic Cavitation. The potential application of HC in removal of Chemical Oxygen Demand (COD) from real effluent with venturi as cavitating device reveals around 40% COD removal with 1 hour of treatment time.

Keywords : advanced oxidation potential, cavitation, chlorpyrifos, COD

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