

DEGRADATION OF DIISOPROPYL METHYLPHOSPHONATE IN AQUEOUS SOLUTIONS BY ULTRASONIC TREATMENT

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Abstract. The degradation of diisopropyl methylphosphonate (DIMP) in aqueous solutions was studied using ultrasound irradiation (ultrasonic probe device) with a fixed frequency of 26.6 kHz and temperatures that change during the irradiation process. It was observed during the irradiation processes that it is affected by some variables, including the pH, the initial concentration, the time, and the concentration of the additive CCl₄. Where five different concentrations (7,14, 30, 50, 80 ppm) were used at different pH levels (2,7,10) and at different times (0,15,30,45,60,80,90 min). The best degradation was observed at a pH of 10 from pH 2,7, and based on that, different concentrations of CCl₄ (0.2, 0.4, 0.6, 0.8 g/L) were used at pH 10 and the study of its degradation and proved the best auxiliary concentration for the semi-complete decomposition is 0.8 g/L and a time of 45 min, the degradation efficiency at that time was 96%, which was the highest. Kinetics modeling was studied, and it was found to be of the first degree. Through this study, it was determined that the degradation rate accelerates in basic solutions with a pH of 10 and that the concentration of the chemical oxidant CCl₄ increases the degradation rate. The study's primary goal is to determine the influence of process variables (such as pH, time, initial concentration, CCl₄ concentration) on the degradation of DIMP and knowledge of the degree of kinetic modeling for DIMP. As far as we know, the method of using ultrasound irradiation has never been investigated.