عنوان مقاله:

Studying Removal of PHCs from Deposits of Petroleum Storage Tanks by Ozonation Method: Determining Optimal Conditions by Central Composite Design Method

محل انتشار:

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خلاصه مقاله:

Introduction: The increasing trend of petroleum production in Iran and lack of proper and systematic management of waste products in the deposition of petroleum storage tanks have made the existing hydrocarbons as a major hazards to the environment. In this study, the ozonation process was used to remove the petroleum deposits. Materials and Methods: In this experimental study, effects of pH, ozone dose, and petroleum hydrocarbons (PHCs) concentration were evaluated. In order to measure the PHCs, using the n-pentanes, the hydrocarbons were first extracted from the environment followed by detection using the GC-FID. The response surface methodology (RSM) was used to evaluate the effect of independent variables on response function. Results: In this study, the efficiency was calculated ۴۵.۴۷% in the optimal conditions of removing PHCs with respect to the optimal energy consumption for the process. Analysis of variance and regression showed that the fitted model had good agreement with the laboratory results. Conclusion: The results demonstrated that the advanced oxidation process (AOP) of ozone at high pH levels could be a useful method for the degradation and reduction of heavy hydrocarbons in petroleum waste. However, regarding the energy consumption, it is suggested to use less costly reactions as pretreatment or final treatment steps.

کلمات کلیدی:

Oily Sludge, Advanced Chemical Oxidation, Petroleum Hydrocarbons, Response Surface Methodology.