Treatment of landfill leachate by sonolysis followed by Fenton process

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\begin{abstract}

The landfill leachate was treated by combined sonolysis and Fenton process. The effect of factors such as operation mode, pH, chemical reagents, initial concentration, and temperature on TOC removal was investigated. The results showed that the pre-treatment of leachate by sonolysis at the presence of Fe\textsuperscript{2+} was beneficial to Fenton process, and the highest TOC removal efficiency was achieved at four different operation modes by this treatment. The optimal reaction condition of Fenton was experimentally determined to be \([H_2O_2]_0 = 100\text{ mM}, [H_2O_2]/[Fe^{2+}] = 5, \text{ pH} = 3, \text{ and } [\text{TOC}]_0 = 600\text{ mg/L}\) by taking both economy and efficiency into consideration in this study. The removal kinetics of leachate by Fenton process followed the first-order reaction kinetics and the kinetic equation of TOC degradation was established.

\textit{Keywords:} Landfill leachate; Sonolysis; Fenton process; Operation mode; Kinetic

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