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Original Article


The Study on Biodegradability Enhancement of Landfill Leachate by Fenton Oxidation

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Abstract:

Backgrounds and Objectives: Leachate is one of the landfill products and also a wastewater bearing the most adverse effects on the environment. Biological methods are usually employed for treatment of young leachate (1-2 years) which is of high concentration of organic compounds with low molecular weight. However these methods are not appropriate for mature leachate (5-10 years) due to having high rate of compounds with molecular weight and the presence of materials resistant to biodegradation and toxic compounds. Advanced oxidation process such as Fenton reagent used in treatment or biodegradability improvement of strong wastewater. In the present study the degradability improvement of mature leachate through oxidation fenton process in bench scale and in batch reactor has been investigated.

Materials and Methods: The samples have been taken from Ahwaz landfill and factors such as initial COD and BOD, pH, BOD5/COD were studied as degradability, the amount of Hydrogen Peroxide, Fe(II), optimal reaction time and optimal pH.

Results: The highest amount of COD removal was observed in PH=3-3.5 and 90 minutes of reaction time. $H_2O_2=29700\text{mg/l}$ and $Fe^{2+}=16500\text{ mg/l}$ in $[Fe^{2+}]/[H_2O_2]=1/14.8$ molarity ratio were obtained as optimal amounts BOD5/COD was equal to 0.38.

Conclusion: This study indicates that Fenton oxidation enhances the biodegradability of leachate.

Keywords:

[Treatment](#) . [Fenton](#) . [Advanced Oxidation](#) . [Degradability](#)

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