

عنوان مقاله:

Evaluation of the efficiency of electrocoagulation process in removing cyanide, nitrate, turbidity, and chemical oxygen demand from landfill leachate

محل انتشار:

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خلاصه مقاله:

Background: Leachate contains toxic and non-biodegradable substances that are not easily treated by conventional treatment methods. This study investigated the effect of pH, current density, and reaction time parameters on the removal of cyanide (CN⁻), nitrate (NO₃⁻), turbidity, and chemical oxygen demand (COD) from leachate by electrocoagulation process. Methods: This study was an experimental one with direct current using four parallel bipolar aluminum electrodes with ۹۰% purity. The length, width, and thickness of the electrodes were ۵ cm, ۱۰ cm, and ۲ mm, respectively. There were ۶ holes with a diameter of ۰.۷ cm on each of the electrodes. The samples were prepared from the old leachate of solid waste landfill in Ghaemshahr, Iran. Results: In this study, at a current density of ۳۳ mA/cm^۲ and a time of ۶۰ minutes, the optimum removal efficiency of cyanide (۱۰۰ %) was obtained at pH ۵.۵ and pH ۱۰. Moreover, the maximum removal of nitrate (۹۹.۶۵ %) and turbidity (۸۶.۴۱ %) were at pH ۵.۵ and pH ۸.۳, respectively and the highest removal efficiency of COD (۸۳.۱۴ %) was obtained at pH ۱۰. Conclusion: The results

showed that the removal of cyanide, nitrate, turbidity, and COD increases with increasing current density and reaction time. Due to the proper removal of nitrate and cyanide from leachate by electrocoagulation, nitrate and cyanide amounts were less than the allowable contamination level. Based on the results, electrocoagulation is considered an efficient and effective method for removing nitrate and cyanide from old leachate of municipal solid wastes

کلمات کلیدی:

Electrocoagulation, Cyanides, Nitrates, Chemical oxygen demand analysis, Solid waste

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