



“Gheorghe Asachi” Technical University of Iasi, Romania



NICKEL (II) REMOVAL FROM INDUSTRIAL PLATING EFFLUENT BY FENTON PROCESS

**Mohammad Malakootian¹, Nader Yousefi², Ali Fatehizadeh³, Steven W. Van Ginkel⁴,
Mahbobeh Ghorbani¹, Sajad Rahimi⁵, Mohammad Ahmadian^{5*}**

¹*Environmental Health Engineering Research Center and Department of Environmental Health, School of Public Health,
Kerman University of Medical Sciences, Kerman, Iran*

²*Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran*

³*Department of Environmental Health Engineering, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran*

⁴*School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA, USA*

⁵*Social Development & Health Promotion Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran*

Abstract

In this study, the efficiency of Fenton's process to remove nickel (II) from industrial plating effluent was investigated. The effect of pH, contact time, concentrations of Fe^{2+} and H_2O_2 were surveyed. Kinetic experiments were performed in order to predict the nickel (II) removal rate from wastewater. At pH 1 to 4, nickel (II) removal efficiency increased and declined at $\text{pH} > 4$. The maximum nickel (II) removal efficiency was 98% at 60 min contact time, pH: 4, and Fe^{2+} and H_2O_2 concentrations of 1,600 and 2,500 mg/L. First-order kinetic describes nickel (II) removal better than zero- or second-order kinetic models. The results show that Fenton's process is effective in removing nickel (II) from industrial plating effluent below the EPA discharge limit.

Key words: advanced treatment, heavy metal, plating effluent, reaction rate

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* Author to whom all correspondence should be addressed: e-mail: moh.ahmadian@yahoo.com; Phone: 0098 831 4216143, Fax: 0098 831 4239050