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Evaluation of the electrode wear and the residual concentration of iron in a system of electrocoagulation

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ABSTRACT

In this study, we evaluated the wear and tear experienced by electrodes and the residual concentration of iron in a system of electrocoagulation using effluent from a dairy industry. The experimental module was composed of iron electrodes, a 10 A source of direct current, and a 1,000 mL beaker. The tests were conducted with and without polarity inversion through the following variables: pH 4.5, time 60 min, and an electric current intensity of 1.5 A. In polarity inversion tests, the mass consumed in the electrode showed an average value of 0.2412 g/L of iron and residual iron presented a mean value of 2.10 mg/L. The treatment efficiency was 99% for turbidity, 95% for COD, and 90% for color. In the tests without polarity inversion, the wear of the electrodes was lower due to the effect of passivation, but residual iron presented high levels of concentration reaching 57.5 mg/L. Treatment efficiency was lower, mainly due to the reduction of color. The treated effluent presented reddish-brown color in some tests.

Keywords: COD; Electrocoagulation; Electrode; Iron; Wear

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