Investigation of bisphenol A removal using peroxy electrocoagulation method

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ABSTRACT

Bisphenol A (BPA) is an endocrine-disrupting compound, which is encountered in many areas of our daily life (feeding bottles, automotive parts, etc.). BPA causes a severe health problem and is transmitted to the environment through surface water, groundwater, industrial wastewater, leakage in BPA depots, etc. In this study, the degradation of BPA in synthetically prepared wastewater was investigated by using the peroxy electrocoagulation method with iron electrodes. The effects of pH, amount of hydrogen peroxide, current density and time parameters were investigated on BPA removal. The results of experimental studies indicated that the optimum conditions were 45 ppm (mg/L), 0.1 g/L Na₂SO₄, 125 mg/L H₂O₂, pH: 2, the current density of 0.11 mA/cm² and 45 min. Under optimum conditions, BPA removal efficiency was achieved as 80.48%. BPA effluent concentrations were calculated according to the pseudo-second-order kinetic model and the reaction rate constant (k) and regression coefficient (R²) in kinetic evaluation demonstrated as 0.0831 and 0.9992, respectively.

Keywords: Bisphenol A; Hydrogen peroxide; Iron electrode; Peroxy electrocoagulation