In this study, the treatment of slaughterhouse wastewater by electrocoagulation (EC) was investigated in batch reactor using aluminum and iron electrodes. Effects of operating parameters for the EC process such as initial pH solution (3–8), current density (20–140 A/m²) and operation time of EC (2.5–60 min) were evaluated for optimum operating conditions. The removal efficiencies for COD, oil-grease and turbidity in slaughterhouse wastewaters were obtained to be 78.3, 94.7, and 90.2% for aluminum and 76.7, 92.8, and 95.9% for iron electrodes at the optimum conditions (pH 4, 100 A/m², and 20 min EC time for Al; pH 6, 100 A/m², and 20 min EC time for Fe). Operation costs for removal of slaughterhouse wastewater at the optimum conditions were calculated for Al electrodes as 2.757 $/m³ and for Fe electrodes as 0.872 $/m³. Besides, the treatment performance of EC and chemical coagulation (CC) processes were compared. For CC process, aluminum sulfate, ferric chloride, and ferric sulfate as coagulants were compared. COD, oil-grease, and turbidity removal efficiencies were 36.4, 93.6, and 89.8% for Al₂(SO₄)₃·18H₂O (pH 7–200 mg Al³⁺/l), 27.6, 88.6, and 85.9% for FeSO₄·7H₂O (pH 7–200 mg Fe³⁺/l), and 37.4, 89.9, and 75.6% FeCl₃·6H₂O (pH 7–100 mg Fe³⁺/l), respectively. As a result, the EC process is more effective in COD, oil-grease, and turbidity removal efficiencies than CC process.

Keywords: Electrocoagulation; Slaughterhouse wastewater; Iron and aluminum electrodes; COD; Oil-grease; Turbidity