

## Treatment of Leather Industry Wastewater with Advance Treatment Methods

**Authors :** Seval Yilmaz, Filiz Bayrakci Karel, Ali Savas Koparal

**Abstract :** Textile products produced by leather have been indispensable for human consumption. Various chemicals are used to enhance the durability of end-products in the processing of leather products. The wastewaters from the leather industry which contain these chemicals exhibit toxic effects on the receiving environment and threaten the natural ecosystem. In this study, leather industry wastewater (LIW), which has high loads of contaminants, was treated using advanced treatment techniques instead of conventional methods. During the experiments, the performance of electrochemical methods was investigated. During the electrochemical experiments, the performance of batch electrooxidation (EO) using boron-doped diamond (BDD) electrodes with monopolar configuration for removal of chemical oxygen demand (COD) from LIW were investigated. The influences of electrolysis time, current density (which varies as 5 mA/cm<sup>2</sup>, 10 mA/cm<sup>2</sup>, 20 mA/cm<sup>2</sup>, 30 mA/cm<sup>2</sup>, 50 mA/cm<sup>2</sup>) and initial pH (which varies as 3,80 (natural pH of LIW), 7, 9) on removal efficiency were investigated in a batch stirred cell to determine the best treatment conditions. The current density applied to the electrochemical reactors is directly proportional to the consumption of electric energy, so electrical energy consumption was monitored during the experiment. The best experimental conditions obtained in electrochemical studies were as follows: electrolysis time = 60 min, current density = 30.0 mA/cm<sup>2</sup>, pH 7. Using these parameters, 53.59% COD removal rates for LIW was achieved and total energy consumption was obtained as 13.03 kWh/m<sup>3</sup>. It is concluded that electrooxidation process constitutes a plausible and developable method for the treatment of LIW.

**Keywords :** BDD electrodes, COD removal, electrochemical treatment, leather industry wastewater

**Conference Title :** ICWPWT 2018 : International Conference on Water Purification and Wastewater Treatment

**Conference Location :** New York, United States

**Conference Dates :** December 17-18, 2018