

## Operating Parameters and Costs Assessments of a Real Fishery Wastewater Effluent Treated by Electrocoagulation Process

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**Abstract :** Similar to most processing industries, fish processing produces large volumes of wastewater, which contains especially organic contaminants, salts and oils dispersed therein. Different processes have been used for the treatment of fishery wastewaters, but the most commonly used are chemical coagulation and flotation. These techniques are well known but sometimes the characteristics of the treated effluent do not comply with legal standards for discharge. Electrocoagulation (EC) is an electrochemical process that can be used to treat wastewaters in terms of both organic matter and nutrient removal. The process is based on the use of sacrificial electrodes such as aluminum, iron or zinc, that are oxidized to produce metal ions that can be used to coagulate and react with organic matter and nutrients in the wastewater. While EC processes are effective to treatment of several types of wastewaters, applications have been limited due to the high energy demands and high current densities. Generally, the for EC process can be performed without additional chemicals or pre-treatment, but the costs should be reduced for EC processes to become more applicable. In this work, we studied the treatment of a real wastewater from fishmeal industry by electrocoagulation process. Removal efficiencies for chemical oxygen demand (COD), total organic carbon (TOC) turbidity, phosphorous and nitrogen concentration were determined as a function of the operating conditions, such as pH, current density and operating time. The optimum operating conditions were determined to be operating time of 10 minutes, current density 100 A.m<sup>-2</sup>, and initial pH 4.0. COD, TOC, phosphorous concentration, and turbidity removal efficiencies at the optimum operating conditions were higher than 90% for aluminum electrode. Operating costs at the optimum conditions were calculated as US\$ 0.37/m<sup>3</sup> (US\$ 0.038/kg COD) for Al electrode. These results demonstrate that the EC process is a promising technology to remove nutrients from fishery wastewaters, as the process has both a high efficiency of nutrient removal, and low energy requirements.

**Keywords :** electrocoagulation, fish, food industry, wastewater

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