ELECTROCHEMICAL TREATMENT OF NITRITE USING STAINLESS STEEL ELECTRODES

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Abstract. The efficiency of nitrite removal in an electrochemical cell was investigated in this study using stainless steel electrodes. The experiments were designed to study the effects of current input, volume of the solution, initial pH, and number of electrodes on removal of nitrite at a concentration typical to aquaculture system effluents. Current variation causes opposite trends, while an increase in current would increase the oxidizing efficiency of the system, the voltage induced increase in pH due to hydrogen evolution would decrease the efficiency of the oxidizing agent formed. However, the highest nitrite removal was achieved at a current of 2 A and a complete removal was attained after a duration of ten minutes. A first order reaction model was developed to predict the effect of current on nitrite removal. The energy consumption was directly proportional to the initial pH and the solution volume, while it was inversely proportional to the number of electrodes.

Keywords: electrochemical treatment, kinetics, nitrite, stainless steel electrodes