

Electrochemical nitrate pretreatment using sulfamic acid and zinc salt in high strength wastewaters and zinc recovery properties of cathode

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Nitrate treatment in nitrate rich wastewaters such as metal plating wastewater, high-level liquid waste and brine of ion exchange have become a significant environmental issue. Though the generation of nitrate rich wastewater is minor, it could be an important cause of operation failure in a wastewater treatment facility due to inclusion of large amount of pollutants. Especially, nitrate treatment is not easy. Properties of nitrate such as high stability at low concentrations and low potential for co-precipitation or adsorption make conventional wastewater treatments difficult. Therefore, a technical consideration of a pretreatment method is need. In this study, sulfamic and zinc salt were added to accelerate nitrate reduction and reduce the extent of ammonia conversion in an electrochemical reaction. The added zinc was electrolytically recovered back to the metallic state and reused as a nitrate reductant. We experimentally tried to obtain the most appropriate operating conditions such as pH, a dosage of sulfamic acid and zinc, current density, operation voltage and the shape of cathodes.