

Enhanced electrochemical nitrate denitrification method using sulfamic acid and zinc cathode

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Pollution of water systems by nitrates raises concerns due to their harmful effects on human health and the environment. Biological and physicochemical methods have been researched to remove nitrate for several decades. Biological methods have relatively low removal rates and are difficult to treat high strength nitrogen-rich wastewater. The conventional chemical nitrate reduction method using active metals consumes a large amount of metals and forms by-products. In this study, an enhanced electrochemical denitrification method that produces nitrogen gas instead of ammonium and reduces consumption of electrons while using sulfamic acid and zinc cathodes was investigated under acidic conditions to remove nitrate in metal finishing wastewater. We experimentally studied to obtain the most appropriate operating conditions such as pH, sulfamic acid dosage ratio, current density, operation voltage and electrolyte.