REMOVAL OF AMMONIA NITROGEN FROM SWINE WASTERWATER BY ELECTROOXIDATION USING Ti/Mn-Ni/SnO2-Sb-CeO2 ANODE

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Abstract

An electrochemical oxidation system using Titanium-based material as anode was setup and used to remove ammonium nitrogen (NH4-N) from swine wastewater. The effects of electrode material, current density, pH, and chlorine ion concentration were evaluated by removal rate of NH4-N and energy consume. The results showed that the NH4-N removal rate reached 98.5% using Ti/Mn-Ni/SnO2-Sb-CeO2 material as anode under the conditions: detention time of 60 minutes, pH of 8-10, current density of 20 mA/cm2, and initial NH4-N concentration of 1000 mg/L. The NH4-N removal was carried out mainly through indirect oxidation. Compared with the raw swine wastewater, the system using Ti/Mn-Ni/SnO2-Sb-CeO2 material as anode presented the superior performance for the NH4-N removal under the optimal conditions. The final NH4-N concentration for biologically pretreated swine wastewater was lower than the 80 mg/L, and met the requirement of discharge standard of pollutants for livestock and poultry breeding in China (GB–18596, 2001).

Key words: ammonia nitrogen removal, electrochemical oxidation, swine wastewater, titanium-based electrode

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