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EFFECT OF COD/N RATIO ON PERFORMANCE OF A SEQUENCING BATCH REACTOR TREATING SALINE WASTEWATER

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Abstract

The performance and microbial community of an anoxic-aerobic sequencing batch reactor (SBR) treating saline wastewater were investigated at different influent COD/N ratios. The average COD removal efficiencies at steady states were 87.46%, 73.75%, 64.87% and 88.34% at the COD/N ratios of 20, 10, 6 and 30, respectively. The average NH_4^+-N removal efficiencies were 79.74%, 74.34%, 64.55% and 89.29% at the COD/N ratios of 20, 10, 6 and 30, respectively. No obvious accumulation of NO_2^--N and NO_3^--N in the effluent was found during the whole operational period. The specific ammonium oxidation rate (SAOR), specific nitrite oxidation rate (SNOR) and specific oxygen uptake rate (SOUR) increased with the decrease of COD/N ratio from 20 to 6, whereas the specific nitrate reduction rate (SNRR) decreased. The diversity indices of microbial community in the SBR were 2.19, 2.10, 2.17 and 2.07 at the COD/N ratio of 20, 10, 6 and 30, respectively. Some bacteria were present at all the COD/N ratios, such as *Nitrosomonas* sp., *Ohtaekwangia kribbensis* and *Propionicimonas paludicola*, suggesting these bacteria could adapt to the shock of influent COD/N ratio.

Key words: COD/N ratio, microbial community, saline wastewater, sequencing batch reactor, specific ammonium oxidation rate

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