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ENHANCED NITROGEN REMOVAL FROM REJECT WATER OF MUNICIPAL WASTEWATER TREATMENT PLANTS USING A NOVEL EXCESS ACTIVATED SLUDGE (EAS) BASED NITRIFICATION AND DENITRIFICATION PROCESS

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Abstract

In this study, a novel excess activated sludge (EAS) based nitrification and denitrification process was developed using EAS to provide nitrifiers and denitrifiers for nitrogen removal from the reject water of a municipal wastewater treatment plant (MWWTP). This can achieve a significant reduction in the nitrogen (N) loading in wastewater treatment plants. The results show that the ammoniacal-nitrogen ($\text{NH}_4^+\text{-N}$) and total nitrogen (TN) removal efficiencies were in the range from 74.7% to 93.1% and 77.4% to 87.9%, respectively. The TN removal efficiency was significantly improved when the step-feed strategy was employed. Therefore, from the technical perspective, the EAS based reject water treatment process can potentially be an alternative pathway for N removal from the reject water. However, for its full-scale application, integrated cost-effective analysis of process capabilities and/or its potential effects on dewaterability of EAS should be considered.

Key words: denitrification, excess activated sludge, nitrification, reject water treatment

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