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Highly efficient of nitrogen removal from mature landfill leachate using a combined DN-PN-Anammox process with a dual recycling system

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Abstract: An efficient and stable combined denitrification-partial nitrification-Anammox process with a dual recycling system was used to remove nitrogen from mature landfill leachate. After 155 d of operation, the NO_3^- as the PN-Anammox byproduct was almost treated with biodegradable organic carbon in raw wastewater in a pre-denitrification reactor by external recycling system. When raw landfill leachate with NH_4^+ -N concentration of 1900 mg/L was treated, an integrated reactor with airlift recycling was combined with the PN and Anammox reactions to efficiently remove NH_4^+ from the inflow. The total nitrogen concentration of effluent stabilized at 20 mg/L and total nitrogen removal efficiency was 99%. The maximum NO_2^- production rate in the aerobic zone was 2.2 kg/(m³·d) and the maximum nitrogen removal rate in the anaerobic zone was 21.4 kg/(m³·d). The most common phyla among the nitrification and the

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(Y Huang)

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