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High-efficiency denitrification for steel wastewater treatment by immobilized bacteria

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ABSTRACT

The performance of immobilized bacteria by waterborne polyurethane in treating steel wastewater with nitrate nitrogen was investigated. It found that the optimal C/N ratio was 5.0 using glucose as an electron donor and the hydraulic retention time was set to 6 h could meet the needs of denitrification in this study. The removal efficiency of immobilized denitrifying bacteria on nitrate–nitrogen in steel wastewater reached 80%, and the nitrate concentration in the effluent was less than 5 mg/L, indicating that microbial immobilization technology has a better treatment effect on steel wastewater. High-throughput sequencing shows that steel wastewater has a domesticated selection effect on the evolution of the immobilized bacteria, making the bacteria which adapt to the quality of the steel wastewater to be dominant bacteria. Through this study, we believe that steel wastewater can be treated in a targeted manner to achieve accurate decontamination by microbial immobilization technology.

Keywords: Immobilized bacteria; Denitrification; Steel wastewater; Nitrate; Wastewater treatment

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