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碳源和氮源对异养硝化好氧反硝化菌株Y1脱氮性能的影响

Effect of carbon and nitrogen sources on nitrogen removal by a heterotrophic nitrification-aerobic denitrification strain Y1

关键词: [异养硝化](#) [好氧反硝化](#) [碳源](#) [氮源](#) [不动杆菌](#)

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摘要: 从焦化废水活性污泥中筛选到一株高效脱氮细菌,命名为*Acinetobacter* sp. Y1.本实验对菌株Y1在不同碳源、氮源、碳氮比及底物浓度下的脱氮特性进行了研究,结果表明,菌株Y1可以利用氨氮、亚硝氮和硝氮生长,不能利用羟胺;以氨氮为唯一氮源进行硝化作用时,柠檬酸钠和乙酸钠是最佳碳源,最佳碳氮比为15,菌株Y1可降解高浓度氨氮,在36h内将 $400 \text{ mg} \cdot \text{L}^{-1}$ 氨氮全部去除, $1600 \text{ mg} \cdot \text{L}^{-1}$ 氨氮的去除率可达21.3%,最大降解速率随着初始氨氮浓度的升高而增大.以硝氮或亚硝氮为唯一氮源进行反硝化时,菌株Y1可以适应高浓度氮源但不能完全去除氮源,当碳氮比为20,经36h培养硝氮和亚硝氮的去除率均达到100%.

Abstract: *Acinetobacter* sp. Y1, a high effective heterotrophic nitrification bacterium, was isolated from the activated sludge of a coking wastewater treatment facility. The characteristics of nitrogen removal by strain Y1 at different carbon sources, C/N ratios, nitrogen sources and substrate concentrations were investigated. The result shows that *Acinetobacter* sp. Y1 can remove different forms of nitrogen sources. The most efficient ammonium removal and growth rate for Y1 was occurred at C/N=15 when sodium citrate was supplemented as the carbon source, ammonium removal rate reached 99% and $\text{OD}_{600\text{max}}$ was 1.432. High concentration of ammonium ranging from $400 \text{ mg} \cdot \text{L}^{-1}$ to $1600 \text{ mg} \cdot \text{L}^{-1}$ could be degraded well by strain Y1. The most efficient nitrogen removal was occurred at C/N=20 when nitrite or nitrate was treated as a sole nitrogen source.

Key words: [heterotrophic nitrification](#) [aerobic denitrification](#) [carbon source](#) [nitrogen source](#) [Acinetobacter](#)

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