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多层填料生物转鼓去除NO废气的效能比较研究

Comparative study on NO removal efficiencies in multi-layer rotating-drum biofilter

关键词: [多层填料生物转鼓](#) [单层填料生物转鼓](#) [一氧化氮](#) [反硝化去除](#) [比较研究](#)

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摘要: 生物转鼓过滤器能有效去除一氧化氮(NO)废气,为进一步提高生物转鼓过滤器的去除效能,实验改变了生物转鼓的填料结构,并与单层填料的生物转鼓进行了比较研究.结果表明,多层填料生物转鼓比单层填料生物转鼓更能有效去除NO,运行也更加稳定.8个月的连续运行实验表明,多层填料生物转鼓对NO去除率稳定在53.9%~93.4%之间,平均去除效率79.8%,而单层填料生物转鼓的平均去除率仅有68.7%;在相同实验条件下,空床停留时间(EBRT)可从单层填料生物转鼓的86.4 s降至多层填料生物转鼓的57.6 s.多层填料生物转鼓的最优工艺条件为,营养液量为1.3~3 L,转速为0.75 r · min⁻¹,在以葡萄糖为碳源时,TOC>1250 mg · L⁻¹后,去除效率增长幅度趋于平缓.

Abstract: The nitric oxide (NO) emission could be removed effectively by rotating drum biofilter. In order to enhance the performance of rotating drum biofilter, the effect of medium configuration on the NO removal efficiency was investigated. The results showed that compared with the single-layer rotating-drum biofilter, the multi-layer rotating-drum biofilter was operated more stably and achieved higher removal efficiencies. The experimental data demonstrated that the NO removal efficiency of the multi-layer rotating-drum biofilter was maintained between 53.9% and 93.4%. Compared with 68.7% average NO removal efficiency of the single-layer rotating-drum biofilter, the NO removal efficiency of the multi-layer rotating-drum biofilter could reached 79.8%. Under the same experimental conditions, the empty bed residence time of the multi-layer rotating-drum biofilter dropped from 86.4 s to 57.6 s of the single-layer rotating-drum biofilter. The optimum conditions for the multi-layer rotating-drum biofilter were the amount of nutrient solution between 1.3 L to 3 L and the rotating speed 0.75 r · min⁻¹. The experimental data also illustrated that the removal efficiency maintained stable when TOC exceeded 1250 mg · L⁻¹ using glucose as the carbon source.

Key words: [multi-layer rotating-drum biofilter](#) [single-layer rotating-drum biofilter](#) [nitric oxide](#) [denitrification](#) [comparative study](#)

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