

能源和环境工程

## 处理低浓度氨氮废水吸附材料的筛选

罗仙平, 李健昌, 严群, 刘俊, 封丹, 黄俊文

江西理工大学资源与环境工程学院

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摘要

目前吸附材料种类繁多, 给处理低浓度氨氮废水的选型带来一定困难。依据离子交换理论, 研究了用沸石、氧化铝和煤渣处理浓度为 $50 \text{ mg} \cdot \text{L}^{-1}$ 模拟氨氮废水的效果, 并绘制了吸附等温线, 测定这3种吸附材料对氨氮废水的离子交换速率及不同pH值和不同温度下交换容量的影响, 并通过工业氨氮废水检验处理效果。结果表明, 沸石和氧化铝满足Langmuir吸附等温模式, 而煤渣满足Freundlich吸附等温式, 三者的最大吸附量分别为 $8.29$ 、 $1.69$ 和 $2.16 \text{ mg} \cdot \text{g}^{-1}$ ;以沸石处理低浓度氨氮废水效果最好, 反应速率快, 适应条件宽, 是处理低浓度氨氮废水的良好吸附材料。

关键词

[氨氮废水](#) [沸石](#) [煤渣](#) [氧化铝](#) [离子交换吸附](#) [筛选](#)

分类号

## Screening of optimum adsorbents for treating wastewater containing low concentration ammonia-nitrogen

LUO Xianping, LI Jianchang, YAN Qun, LIU Jun, FENG Dan, HUANG Junwen

Abstract

In order to overcome the difficulty in choosing the right type from numerous adsorbents available for treating wastewater containing low concentration ammonia, according to the theory of ion exchange, zeolite, alumina and cinder were used to absorb simulated wastewater, and adsorption isotherms were drawn (the concentration of ammonia-nitrogen was  $50 \text{ mg} \cdot \text{L}^{-1}$ ). Further research was done on the ion exchange rate of adsorbents and exchange capacity at different pH values and temperatures. The adsorption of ammonia was tested through the treatment of industrial wastewater. The experiment indicated that zeolite and alumina could meet the Langmuir isotherm mode, while cinder could meet the Freundlich isotherm mode. Their largest absorbance were  $8.29 \text{ mg} \cdot \text{g}^{-1}$ ,  $1.69 \text{ mg} \cdot \text{g}^{-1}$  and  $2.16 \text{ mg} \cdot \text{g}^{-1}$  respectively. The results showed that treating low ammonia wastewater with zeolite had better effect, quick response and wide applicability.

Key words

[ammonia-nitrogen wastewater](#) [zeolite](#) [cinder](#) [alumina](#) [ion-exchange adsorption](#) [selection](#)

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