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能源和环境工程

电晕-吸收法治理NO_x废气技术

黄立维, 松田仁树

浙江工业大学生物与环境工程学院，浙江 杭州 310032;日本名古屋大学难处理人工物研究中心，名古屋 464-8603，日本

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摘要 采用电晕结合现场化学吸收的方法对NO的去除效果进行了实验研究. 电晕反应器为线筒式结构，作为吸收剂的$Ca(OH)_2$均匀地覆盖在筒壁的内表面. 实验表明此法能有效地除去气流中的氮氧化物，NO的去除率大大高于反应器内没有固体吸收剂的情况，同时反应器出口NO_2的浓度小于12 mg•m^{-3}. 可以认为反应器内的$Ca(OH)_2$吸收剂与NO的氧化产物NO_2或NO_3的吸收反应促进了NO的分解反应. 研究还发现在气流中有氧气和水分存在时有利于NO的氧化反应和气固吸收反应，从而提高了NO的去除率.

关键词 非平衡等离子体 电晕反应器 氮氧化物 吸收 去除

分类号

REMOVAL OF NO_x BY PULSED CORONA REACTOR COMBINED WITH *IN SITU* ABSORPTION

HUANG Liwei,Hitoki Matsuda

Abstract

Removal of NO by nonthermal plasma combined with *in situ* absorption was experimentally investigated with a wire-in-tube pulsed corona reactor. High pulse voltage was applied to the wire of the reactor and the tube was grounded. For the reactor combined with in situ absorption, the grounded electrode was covered by a $Ca(OH)_2$ layer as the sorbent for *in situ* capture of the NO oxidation products. It was found that NO removal was much higher by the reactor combined with in situ absorption than by the reactor without $Ca(OH)_2$ sorbent, and meanwhile the outlet NO2 concentration from the reactor was also suppressed to less than 12 mg•m^{-3}.It was indicated that in situ absorption of the NO_2 or NO_3 by $Ca(OH)_2$ was responsible for the promotion of NO removal. The existence of O_2 and water vapor in the gas stream was beneficial for gas-solid absorption reaction, therefore resulting in the increase of NO removal.

Key words nonthermal plasma corona reactor NO_x absorption removal

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通讯作者 黄立维 hliwei@mail.hz.zj.cn