

工程热物理

尿素/三乙醇胺湿法烟气脱硫脱硝的试验研究

陆雅静 熊源泉 高鸣 姚志彪 郑守忠

洁净煤发电及燃烧技术教育部重点实验室(东南大学) 洁净煤发电及燃烧技术教育部重点实验室(东南大学) 洁净煤发电及燃烧技术教育部重点实验室(东南大学) 洁净煤发电及燃烧技术教育部重点实验室(东南大学) 中国水利电力物资天津公司

摘要: 尿素溶液与NOx反应生成N2和CO2气体, 可实现烟气同时脱硫脱硝, 该文进行了尿素/三乙醇胺湿法脱硫脱硝的试验研究。试验采用双级串连的填料塔为主体反应器, 分别对气速、液气比、反应物浓度、添加剂浓度、反应温度等参数对尿素溶液吸收SO2反应的影响进行了试验研究, 并进行了尿素溶液同时吸收SO2和NOx的试验研究, 研究表明: 增大气速、液气比可使脱硫效率增加, 而三乙醇胺和尿素浓度对脱硫效率影响较小。SO2和NOx具有相互协同促进作用, 其净化效率在试验条件下可分别提高1%~3%和5%~6%, 总脱硫效率可达95%以上, 脱硝效率在63%以上。

关键词: 尿素 三乙醇胺 脱硫 脱硝

Experimental Investigation on the Removal of SO2 and NOx From Flue Gas by Aqueous Solutions of Urea/Triethanolamine

LU Ya-jing XIONG Yuan-quan GAO Ming YAO Zhi-biao ZHENG Shou-zhong

Abstract: Aqueous solutions of urea can remove NOx and SO2 simultaneously with the NOx reduction into N2 and CO2. The experimental research on the NOx and SO2 emission in aqueous solution of urea/triethanolamine was performed by a set of two filling absorption towers. This paper investigated the effects of many key operating parameters, such as the velocity of flow, liquid-gas ratio, reactant concentration, additive concentration, temperature, etc., on the removal efficiency of SO2, alone, and that of NOx and SO2, simultaneously in aqueous solution of urea/triethanolamine. The results show that the efficiency of removal SO2 from flue gas increases with increasing the velocity of the flue gas and liquid-gas ratio, but the urea concentration and additive concentration have fewer affect. It finds that SO2 and NOx have synergistic effect each other in the process of the simultaneous desulfurization and denitrification by aqueous solutions of urea/additive. The removal efficiency of SO2 and NOx increases 1%~3% and 5%~6% respectively, compared with those at single desulfurization or denitrification process. In this case, the total efficiency of removal of SO2 and NOx from flue gas is more than 95% and 63% respectively.

Keywords: urea triethanolamine De-SO2 De-NOx

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通讯作者: 陆雅静

作者简介:

作者Email: lyjing0118@163.com

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