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论文

燃煤烟气脱硫海水曝气过程中汞的释放研究

陈进生[1]，罗津晶[2]，罗锦英[2]

1．中国科学院城市环境研究所
2．厦门大学环境科学研究中心

摘要：

作为湿法脱硫工艺的吸收剂，海水在去除烟气中SO2的过程中，也能吸收烟气中的二价汞，但在恢复水质的曝气过程中，已吸附在海水中的二价汞易释放出来。该文采用金丝捕汞法富集曝气池上空大气中的汞，同时采集曝气池海水水样，考察不同运行工况下脱硫海水中的汞向大气释放的浓度水平及变化趋势。结果表明：曝气池上空总气态汞(total gaseous mercury, TGM)的浓度平均值为10.01 ng/m3，高出当地背景值的20倍以上。曝气池上空TGM浓度与池中海水的汞浓度、曝气强度呈正相关性。TGM浓度在白昼时段高于夜间时段，并在中午日光照射较强的时段出现峰值，表明光致还原对曝气池海水中汞的释放起到了重要的促进作用。研究结果有利于评价海水脱硫工艺的环境风险及其对局部区域大气质量的影响。

关键词： 海水法烟气脱硫 曝气 总气态汞浓度 释放

Study on the Mercury Emission From Seawater for Coal-fired Flue Gas De-sulphurization During Aeration Process

CHEN Jin-sheng[1], LUO Jin-jing[2], LUO Jin-ying[2]

1. Institute of Urban Environment, Chinese Academy of Sciences
2. Environmental Science Research Center, Xiamen University

Abstract:

As the absorbent of wet flue gas desulphurization (FGD) technology, seawater can dissolve oxidated mercury during the process of the removal of SO2 in flue gas, but in the process of aeration for the quality improvement of seawater, the mercury dissolved in seawater is inclined to release again. The method of gold amalgamation was employed to sample total gaseous mercury (TGM) in the air above the aeration sink, and the seawater in sink was also sampled to study the concentration and trend of mercury emitted from the aeration sink for the seawater-FGD in different operation conditions. The results showed that the average concentration of TGM was about 10.01 ng/m3, which was 20 times higher than that of local background, and it presented a positive correlation with mercury concentrations in seawater of the FGD system and aeration intensity. The experiment also found that the TGM concentrations in daytime, especially during noon time, were higher than those at night, which could be explained by that the photo-reduction played an important role on mercury emission from seawater in the aeration sink. The result of experiment is in favor of evaluating the environmental risk and the impact on local air quality caused by seawater FGD technology.

Keywords: seawater flue gas de-sulphurization aeration total gaseous mercury concentrations emission

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通讯作者: 陈进生

作者简介:

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