

燃煤烟气净化设施对汞排放特性的影响

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摘要

为研究燃煤锅炉烟气净化设施对汞排放特性的影响,采用Ontario-Hydro方法,对设有催化脱硝、静电除尘、海水脱硫的300 MW燃煤锅炉排放烟气中汞的含量与形态进行分析,同时测定锅炉的煤、底渣、飞灰等固体样品以及脱硫塔前后、曝气之后海水样品中的汞含量。实验结果为:烟气中的气态汞占总汞的79.1%以上,脱硝催化剂对汞的价态具有强烈的转化作用,烟气中83.4%的气态Hg⁰被氧化成气态Hg²⁺;静电除尘对颗粒态汞的去除率几乎达到100%;在脱硫塔中,海水对烟气中汞的洗脱率高达73.6%,曝气后排放前的海水中含汞量是新鲜海水的5.5倍。研究表明锅炉烟气净化设施对汞的排放特性有着重要的影响。

关键词 [燃煤烟气](#) [汞](#) [排放特性](#) [烟气净化设施](#)

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Effect of Flue-gas Cleaning Devices on Mercury Emission From Coal-fired Boiler

Abstract

In order to study the effect of flue-gas cleaning devices on mercury emission from coal-fired boiler, Ontario-Hydro method had been applied to determine the mercury concentration and speciation in the flue-gas emitted from a 300MW coal-fired boiler, which was equipped with various pollution control devices, including selective catalyst reduction (SCR) De-NO_x system, electrostatic precipitator (ESP), and flue-gas seawater De-SO₂ system (FGD). Mercury concentration in raw coal, bottom ash and fly ash of the boiler, seawater at the inlet and outlet of SO₂ absorption reactor and the drainage of aeration sink, were also analyzed. The results indicate that the percentage of gaseous mercury in total mercury discharged is more than 79.1%. De-NO_x catalyst strongly affects the mercury speciation transformation, showing a conversion rate of 83.4% for Hg⁰ to Hg²⁺. The removal efficiency of particulate mercury by ESP is close to 100%. With seawater FGD, the removal efficiency of mercury is as high as 73.6%. The mercury concentration in the seawater of drainage from aeration sink is 5.5 times higher than that in fresh seawater. The study shows that the flue-gas cleaning devices in coal-fired power plant play an important role on mercury emission characterization.

Key words [coal-fired flue gas](#) [mercury control](#) [exhaust hood](#) [flue-gas cleaning devices](#)

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