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循环流化床燃煤锅炉中的汞迁移研究

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Study on mercury migration in a circulating fluidized bed combustion boiler

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摘要 采用美国环保署颁布的吸附剂吸附汞采样方法30B(USEPA 40 CFR Part 60 30B)采集燃煤烟气中汞。选择一循环流化床燃煤机组进行现场采样,吸附剂吸附烟囱处烟气中的汞、入炉煤样、锅炉底灰、静电除尘器飞灰等样品同时采集。对该机组中汞质量平衡率进行衡算,通过汞质量平衡率说明了汞采样方法的准确性和有效性。评价了汞在飞灰、底灰和烟气中的分布,循环流化床锅炉底灰中对脱汞的贡献率仅0.55%,飞灰脱除汞的效率高达83.37%,剩余的16.08%的汞排放入大气环境,表明循环流化床机组是有效控制汞的清洁煤燃烧技术。

关键词： 循环流化床　汞迁移　汞采样方法30B　汞质量平衡

Abstract： Mercury concentrations in the flue gas at the stack were measured using a sorbent trap method as per United States Environmental Protection Agency Method 30B (i.e.,USEPA 40 CFR Part 60 30B),and the sampling method has merits of convenient setup, simply operation and fast analysis.Field tests were conducted at a unit of the Circulating Fluidized Bed Combustion (CFBC).During the course of sampling the mercury in the flue gas, coal samples, bottom ash and fly ash were collected and analyzed.Rates of mercury material balance though the unit were calculated, and correctness and validity of mercury sampling method were certified.Mercury distributions in fly ash, bottom ash and flue gas were evaluated, and the results showed that firstly bottom ash of CFBC removed only 0.55% of total mercury, secondly removal efficiency of fly ash reaching 83.37%, in the end 16.08% of total mercury was emitted to the air.The determined data of mercury emissions show that the CFBC is a clean coal combustion technology of effectively removing mercury.

Key words： circulating fluidized bed combustion　mercury migration　mercury sampling method 30B　mercury material balance

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