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工程热物理

污泥与煤混烧中飞灰对汞的吸附特性

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摘要： 为了解飞灰对汞的吸附特性，用氮气吸附等温线分析了4个飞灰样品的比表面积和孔隙分布；应用基于(Frenkel- Halsey-Hill，FHH)模型的方法计算了它们的分形维数，分析了飞灰样品的化学组分对汞吸附的影响。结果表明，飞灰残碳量与汞含量呈正相关关系。飞灰颗粒比表面积增大，飞灰的汞吸附趋于增加。孔分布越宽越有利于汞的吸附， 其中微孔在汞吸附过程中发挥更为重要的作用。飞灰样品的分形维数处于2.1~2.6之间，且分形维数能较好地反映飞灰对汞的物理吸附性能。烟气成分与飞灰化学组成可能对汞存在一定的催化氧化作用。

关键词： 混烧 飞灰 汞吸附 孔隙结构 分形维数 灰组分

Adsorption Characterization of Mercury by Fly Ashes During Co-combustion of Sludge and Coal

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Abstract: In order to understand the performance of fly ashes on mercury adsorption, the surface area and pore distribution of four fly ash samples was studied by using the nitrogen adsorption isotherms. Their fractal dimensions were also calculated by a method based on Frenkel-Halsey-Hill (FHH) model. Chemical compositions of fly ash samples were also determined. The results indicate that there is a positive correlation between unburned carbon content and mercury content in fly ash samples. The bigger the specific surface area of fly ash particles and thus the more mercury adsorbed. Wider pore distribution is beneficial to mercury adsorption and micropores play a more significant role in mercury adsorption. The fractal dimensions of fly ash samples are between 2.1 and 2.6, and they can reflect the characterization of the physical adsorbility of fly ashes. The components of flue gas and chemical compositions of fly ash may have some catalytic oxidation effect on mercury adsorption.

Keywords: co-combustion fly ash mercury adsorption pore structure fractal dimension ash composition

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