

### 垃圾焚烧飞灰中重金属的热稳定化条件及机理

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### Thermal stabilization condition and mechanism of heavy metals in fly ash of solid waste incineration

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**摘要** 研究了生活-农业混合型垃圾焚烧飞灰与单一生活垃圾焚烧飞灰(简称混合型飞灰与单一型飞灰)热处理过程中的重金属挥发特性与稳定化效果,并结合FT-IR、XRD检测手段对稳定化机理进行了探讨。结果表明,单一型飞灰中重金属的挥发性普遍高于混合型飞灰,垃圾源氯含量对重金属的挥发性有明显影响。飞灰中Mn、Cr不易挥发,Zn、Cu较易挥发,Pb、Cd挥发性很强,热处理温度超过1 000 ℃时挥发率都超过50%。800 ℃为相对最优的热处理温度,兼顾了热处理过程重金属稳定化与抑制挥发。800 ℃以上时飞灰形成了稳定的硅酸盐结构体系,是重金属热处理后难以浸出的主要机理。

**关键词:** 垃圾焚烧 热处理 稳定化 挥发

**Abstract:** The volatility and the stabilization of heavy metals in fly ash in municipality & agriculture mixed waste incineration(Type A) and municipal solid waste incineration(Type B) were investigated. And the heavy metals stabilization mechanism was studied by using FT-IR and XRD. The results indicate that the volatility of heavy metals is higher in type B than that in type A, and is significantly affected by the content of chloride in waste source. The volatility of heavy metals in fly ash varies in a sequence of Mn, Cr < Zn, Cu < Pb, Cd. More than 50% of Pb and Cd are volatilized when the temperature exceeds 1 000 ℃. The relatively optimal thermal treatment temperature is 800 ℃ and the heavy metals stabilization is higher and the evaporation rate is lower. The primary mechanism of heavy metals stabilization is the formation of stable silicate structure system above 800 ℃.

**Key words:** solid waste incineration thermal treatment stabilization evaporation

收稿日期: 2013-04-11;

基金资助:

国家自然科学基金(51108100); 广西自然科学基金(2013GXNSFBA019249); 广西教育厅科研项目(200103YB020); 广西师范大学博士启动基金项目。

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引用本文:

钟山,冯经昆,陈阳等. 垃圾焚烧飞灰中重金属的热稳定化条件及机理[J]. 燃料化学学报, 2013, 41(12): 1532-1538.

ZHONG Shan, FENG Jing-kun, CHEN Yang et al. Thermal stabilization condition and mechanism of heavy metals in fly ash of solid waste incineration[J]. J Fuel Chem Technol, 2013, 41(12): 1532-1538.












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