

### **143w Heavy Metal Recovery from Molten Fly Ashes by Chlorination**

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Molten fly ashes, produced from melting furnaces for municipal solid waste and incineration ash etc., contain valuable heavy metals. It is desirable to recover these metals from the ashes for the sake of resource recycling and environmental concern in landfill. The present study was undertaken to obtain fundamental data for developing the efficient recovery process of heavy metals from various molten fly ashes. Volatilization behavior of lead and zinc was investigated for the four types of ash produced from the electric - resistance, fluidized - gasification melting, coke bed melting and direct melting furnaces. The ash samples were heated at terminal temperatures ranging from 873 to 1073 K in a nitrogen stream with a fixed bed reactor. Polyvinyl chloride and carbon derived from phenolphthalein were used as chlorination accelerating agents. The addition of polyvinyl chloride was effective for the release of lead, which was identified as oxide in every sample. Several kinds of zinc compound such as oxide, sulfide, carbonate, silicate and aluminosilicate were observed depending on the ashes. Zinc originating from oxide and aluminosilicate was volatilized at 1073 K by the addition of polyvinyl chloride, appreciable volatilization was not observed for zinc sulfide and silicate. All of the forms of zinc were released effectively from the ashes by the addition of carbon. The release extents of more than 90% were obtained at 1073 K for the four sample ashes. Effects of additives and chemical forms of heavy metals on chlorination behavior were discussed kinetically.