Sorbent control of trace metals in sewage sludge combustion and incineration

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Abstract

Coal and wastes combustion have become an important issue not only in terms of energy generation but also environmental conservation. The need for alternative fuels and wastes management has made the two energy sources of importance. However, the utilization of the two is faced with problems of impurity trace metals in the fuel. These metals usually speciate during combustion or incineration leading to generation of fumes and subsequently particles. This paper reports on the study aimed at understanding the speciation of trace metals and their emission from combustion systems as particulates. Experiments carried out using a down-flow furnace and theoretical study carried out using lead, chromium and cadmium as basic metals had shown that their speciation and subsequent emission is controlled by both chemical composition and physical properties of the fuel. The physical and chemical and physical properties of the fuel and their respective compounds and the operating conditions of the incineration and combustion system control the enrichment of the particles with trace metals.