

Release of Mercury Vapor from Coal Combustion Ash

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ABSTRACT

The release of mercury vapor from coal combustion ash was tested. Six ashes with atypically high levels of total mercury content were selected as having a great potential for releasing measurable amounts of mercury vapor. The ashes selected included four eastern bituminous fly ashes, one Powder River Basin (PRB) fly ash, and one PRB flue gas desulfurization material.

Air was passed through compacted 100-gram aliquots of each sample at 1 mL/min and vented to a gold-coated quartz trap to collect the mercury vapor. The samples were at ambient and near-ambient (37°C) temperatures. All samples indicated the release of low picogram levels of mercury after 90 days. No pattern was evident to link the total mercury content to the release of mercury vapor. A release of 200 picograms of mercury per 100 grams of ash in a 90-day period would equate to a release of 1.6×10^{-8} pounds/ton/year.

Experiments are currently under way to determine the effect of biota on mercury release from two of the ash samples. These samples have been placed into a slurry and inoculated with a broadband selection of biota. The experiment is expected to run for approximately 60 days at which time sorbent traps will be analyzed to determine the amounts of methyl mercury and elemental mercury released from the samples. A carbon trap is being used for methyl mercury, and a gold-coated quartz trap is in place for capture of elemental mercury.

