Mercury Release from Coal Combustion Products (CCPs)

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ABSTRACT

Recent research has indicated that mercury (Hg) in coal fly ash derived from subbituminous and bituminous type coals is unlikely to be released through volatilization or leaching. Lignite-based ash was found to emit Hg to the air. Solids collected from systems with components thought to enhance Hg removal (i.e. activated carbon injection, flue gas desulfurization (FGD), and selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR)) may have higher Hg concentrations and therefore a higher potential for Hg release. For this study we investigated the potential for Hg release to the air and water from solids and liquids collected from coal-fired units with FGD equipment, SCR equipment, and sorbent injection for Hg removal. In addition, Hg emissions were measured in situ from a lignite ash, a bituminous ash, and a stabilized FGD solids landfill, and compared with emissions from surrounding soils. In the laboratory study, most dry samples acted as sinks for atmospheric Hg in the dark at 25^{o}C. When exposed to light or increased temperature (45^{o}C), deposition of Hg to the substrates in most cases continued but decreased. Wet FGD samples emitted Hg. Most sample extracts (EPA method 1312 (SPLP)) had low Hg concentrations (<6.5ng/L). Mercury flux rate in the dark at 25^{o}C was a function of carbon content (L.O.I) and air mercury concentrations. In situ emissions associated with the bituminous ash landfill were very low and comparable to that occurring from surrounding low Hg soils. Data will also be presented on emissions from the lignite-based ash and FGD solids landfills.

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