

# Measurement of mercury flux from coal utilization by-products with a laboratory flux chamber

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## Abstract

Following the plausible link between mercury emissions and negative environmental and human health impacts, reduction of mercury emitted in the flue gas from coal-based power plants is now required. As mercury is increasingly removed from the flue gas, it will be captured in coal utilization by-products (CUBs). CUBs find use as gypsum for wallboard production, cement, soil amendments, and flowable fill. Recent research has suggested that CUBs do not emit significant amounts of mercury through volatilization. However, the effects of temperature, moisture content, and light exposure are unclear. Also, mercury control technologies have potential to increase the amount of mercury in the CUBs, such that results may differ from previous studies. This project addresses these issues by studying mercury flux from a variety of samples placed in an environmental chamber subjected to different environmental conditions. The chamber consists of a Pyrex jar with a Teflon plate base with inlet and outlet ports that allow for ambient air to pass through the chamber. A Tekran measures mercury concentration in inlet and outlet air such that flux measurements are made every 20 minutes. Temperature, humidity, and light exposure are monitored with sensors placed in or near the chamber. Long-term experiments with six different CUB samples have been conducted in which the sample is kept in dark and dry conditions. Results vary from small levels of absorption to release and are independent of initial sample mercury content. Current experiments involve subjecting the CUB samples to varying conditions of light exposure and moisture content.

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