

The Fate of Ammonia and Mercury In The Carbon Burn-Out (CBO) Process

Vincent M. Giampa

Progress Materials Inc. One Progress Plaza, Suite 1000, St. Petersburg, Florida 33733

KEYWORDS: Carbon Burn-Out, carbon reduction, fly ash beneficiation, Mercury, Ammonia

ABSTRACT

Carbon Burn-Out (CBO) is a very robust system for carbon removal from fly ash. Two commercial installations are now in service; each of which processes over 200,000 tons per year. One of these has been in service since early 1999, and the other since Fall 2002. CBO processed ash is used as a replacement for Portland cement. CBO fly ash exhibits consistent quality and has gained excellent market acceptance in its market areas.

Recently, questions have been raised concerning the environmental fate of ammonia and mercury in the Carbon Burn-Out system. Ammonia is not a naturally occurring material in fly ash but rather is a contaminant that results from post-combustion environmental controls.

These include Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR) and Electrostatic Precipitator (ESP) conditioning. Use of these treatment technologies will result in fly ash contaminated with ammonia slip, which may be unmarketable depending upon the concentration.

Mercury is a naturally occurring trace element found in coal. A significant portion of the mercury remains with the fly ash following combustion. During coal combustion mercury is either collected on the ash or reports to the gas phase of the combustion process. The mercury containing fly ash is then used as feedstock for the Carbon Burn-Out process.

Given the industry's concerns, Progress Materials conducted investigations as to the environmental fate of ammonia and mercury in the Carbon Burn-Out system. This paper will present the results of these and ongoing investigations concerning mercury and ammonia.

Submitted for consideration in the 2005 World of Coal Ash, April 11-15, 2005, Lexington, Kentucky, USA.