

Leaching of CUB Using a CSTX

Candace Kairies, Carol Cardone, and Karl Schroeder

U.S. Dept. of Energy, NETL, PO Box 10940, Pittsburgh, PA 15236

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ABSTRACT

Leaching studies of coal utilization byproducts (CUB) are often performed to determine the compatibility of the material in a particular end-use or disposal environment. Typically, these studies are performed using either a batch or a fixed-bed column technique. The fixed-bed column offers the advantage of a continuous flow of effluent that provides elution profiles with changing elution volume and pH. Unfortunately, clogs can form in fixed-bed leaching columns, either because of cementitious properties of the material itself, such as is seen for FBC fly ash, or because of precipitate formation, such as can occur when a high-calcium ash is subjected to sulfate-containing leachates. A continuous, stirred-tank extractor (CSTX) is being used as an alternative technique that can provide the elution profile of column leaching but without the clogging problems. The apparatus consists of a 6-liter, all-glass and Teflon reactor (Ace Glass 6386-28) with a bottom-outlet filter (porosity D) and a mechanical stirrer. Influent and effluent flow rates are controlled using FMI model RHSY pumps. The CSTX has been successfully employed in the leaching of a fluidized-bed combustion (FBC) ash and a flue-gas desulfurization (FGD) -derived stucco, both of which would set-up under traditional column leaching conditions. The leaching results obtained for a number of elements of interest, including mercury, will be described.

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