

# Calcium Impact on Arsenic Adsorption onto Coal Fly Ash

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## ABSTRACT

Batch tests indicated that arsenic leaching is significantly affected by the calcium concentration in fly ash. Arsenic leaching from low calcium fly ash was increased with increase of pH at alkaline pH range. However, fly ash with a higher calcium content exhibited an arsenic leaching peak at pH 9. With the further increase of pH, arsenic leaching was decreased until pH12, and then increased again with the increase of pH. For class C ashes (Ca > 2%), much less arsenic was available for leaching at alkaline pH. It was proposed that arsenic leaching from fly ash was controlled by both adsorption and precipitation. To improve our understanding of arsenic leaching behavior, As(V) adsorption on washed ash was performed with and without calcium addition. Results suggested that the addition of calcium significantly reduced the soluble arsenic ratio at alkaline pH. We are developing an adsorption-precipitation model to quantify the arsenic adsorption in the presence of calcium, which will consider interactions among As(V), calcium, and surface sites. The corresponding adsorption constants will be determined.

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