

Ge Extraction from Gasification Fly Ash

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ABSTRACT

Gasification fly ash produces water soluble germanium species (GeS_2 , GeS and GeO_2). This fact together with the high marked price of this element and the relatively high contents in IGCC Puertollano fly ashes drove our research towards the study of possible extractive processes for this element. Major objectives of this research were to find a low economic and environmental costs strategy for this process. Several water based extraction tests were carried out using different IGCC Puertollano fly ash samples, under different temperatures, water/fly ash ratios, and extraction times. High Ge extraction yields (close to 80%) are obtained at room temperature but also high proportions of impurities were also simultaneously dissolved. With a slight increase of the temperature Ge extraction yields are kept at similar levels, but a decrease of the content of impurities, and a reduction of the water/fly ash ratio and extraction time are achieved. The experimental data evidences that the Ge extraction yields are influenced by chloride and calcium concentrations and by sulfide dissolution. We would like to thank the European Coal and Steel Community (ECSC) for supporting this study (ECSC 7220-PR145).