

Loss of sample during density separation: calcite precipitation from economizer fly ash

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ABSTRACT

The fly ash collected from the Economizer of a Portuguese power plant was characterized using different techniques. Two subsamples were obtained using the density separation method (1 g/cm³ distilled water; 22°C; 10 minutes of mechanical agitation; 24 h settling; vacuum filtration through a 1.2-µm membrane filter; oven drying at 80 °C), but in the final around 2% of the sample was lost. Since a carefully work was performed in order to save as much fine size fly ash as possible, this was considered an important and unexpected loss of particulate material. However, an explanation to this lost of sample may not be the lost of fine particulate but the dissolution of more easily mobilised elements such as calcium. In fact during this process, a thin inorganic coat floating on the top the light fraction was formed, and this layer was the target of a SEM/EDX study for components identification and chemical composition. The SEM results revealed a layer composed by rhombohedral microcrystals, and the EDX analysis a chemical composition made of calcium, carbon and oxygen which indicates that these layers are composed of calcite.

Final remarks - some calcium carbonate precipitated in the light fraction as a layer composed of micro-calcite, and eventually the remaining dissolved material was lost after the filtration process contributing to the ≈2% lost of initial sample.

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