

Characterization of Coal Fly Ash From a Portuguese Power Plant

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ABSTRACT

This study aims to characterize the quality of coal and combustion by-products of a Portuguese 314 MW power plant equipped with low-NO_x burners and burning low-sulfur feed coals from Colombia and South Africa.

The coals were collected before and after milling and the ash samples were collected from hoppers of the air re-heaters, the economizers and the electrostatic precipitators. After the samples were dry screened at 150, 75, 42 and 25 μm. The stack sampling was performed with an ANDERSEN "Universal Stack Sampler". All samples were analyzed using a scanning electron microscope equipped with EDS.

The SEM/EDS analysis of the fly ash revealed that char is concentrated in the largest size fraction, Fe minerals are concentrated in the 75-45 μm fractions, and the smallest size fractions are essentially composed by aluminum-silicate glass. The stack particles are composed of: 0.1-10 μm spheres (calcium-rich, aluminum-silicate glass with Fe, Mg and Ti and complex aluminum-silicates with Fe, Na, P, S, K, Ca and Ti), carbonaceous particles up to 100 μm, and surface cotton-like particles (1-0.1 μm).

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