

Triboelectric Processing of Combustion Fly Ash after Carbon Burn-Out

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ABSTRACT

Coal combustion fly ash can be considered to be a complex physical mixture of very small particles. The value of some of the components, for example - cenospheres, is greater than that of the fly ash itself. Although beneficiation techniques based on flotation, density and magnetics have been studied for years in efforts to extract fly ash components, only recently was pneumatic transport, triboelectrostatic beneficiation tried as a way to selectively extract distinct components. Because it beneficiates on the basis of the particulate's surface electronic properties, triboelectrostatics may be expected to extract different components than these other beneficiation techniques.

We will discuss the selectivity for beneficiating fly ash after carbon burn-out as obtained by using pneumatic transport, triboelectrostatic techniques. Our previous, initiating work in this area was able to separate products by color, and particle size, density and crystallinity. The parent ashes had been collected at utilities, but the carbon burn-out had been accomplished in a laboratory furnace at 750°C for 16 hours. We extend this work by beneficiating a fly ash that has been subjected to carbon burn-out in a commercial facility and then by comparing these data to our previous beneficiation data for laboratory-prepared samples. Unique particulate extraction potential is shown and discussed.