

# The Influence of Ash Particle Interactions During Pneumatic Transport, Triboelectric Beneficiation

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## ABSTRACT

Triboelectric beneficiation techniques rely on intense particle-particle collisions to establish bipolar charge on the particles within the physical mixture being processed. This bipolarity is a fundamental reason that the applied electric field in the separator section of a process causes carbon (positive polarity) and ash (negative polarity) to be separable. Is it then possible to enhance bipolarity and the absolute magnitude of charge, and hence beneficiation performance, by adding particle type(s) that enhance electron transfer or bipolar charging? Or, relative to combustion ash, is it possible to synergistically combine a poorly charging ash with a good charging ash to cause enhanced beneficiation performance?

This paper examines these possibilities by processing mixtures of two coal combustion ashes under gas transport, triboelectric processing techniques. The data suggest that, rather than promoting synergistic interactions, the particles in the two ashes behaved independent of one another. In other words, the resultant recovery curves for low LOI products were calculable by assuming a simple mathematical addition of the individual components. Therefore, the beneficiation performance for a mixture of ashes can be calculated without testing of the mixture if the recovery curve for each ash is known. Such a conclusion is important for the triboelectric processing of ashes in a facility that would handle more than one type of ash.