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Investigation Particle Behavior in Gas-Solid Filtration with Electrostatic Discharge in a Hybrid System

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Abstract : Synthetic fibers are widely used in gas filtration. Previous attempts to optimize the filtration process have employed mixed fibers as the filter medium in gas-solid separation. Some of the materials most frequently used this purpose are composed of polyester, polypropylene, and glass fibers. In order to improve the retention of cement particles in bag filters, the present study investigates the use of synthetic glass fiber filters and polypropylene fiber for particle filtration, with electrostatic discharge of 0 to -2 kV in cement particles. The filtration curves obtained showed that charging increased the particle collection efficiency and lowered the pressure drop. Particle diameter had a direct influence on the formation of the dust cake, and the application of electrostatic discharge to the particles resulted in the retention of more particles, hence increasing the lifetime of fabric filters.

Keywords : glass fiber filter, particle, electrostatic discharge, cement
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