

Three-dimensional Simulation of Particle Filtration in Electrospun Nanofibrous Filters

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Abstract

Virtual 3-D geometries resembling the internal microstructure of electrospun nanofiber media ($100 < d_f < 1000\text{nm}$) are considered in this work to study the influence of slip effect on the media's collection efficiency. In particular, particles in the range of $100\text{nm} < d_p < 1000\text{nm}$ are introduced to the solution domain with a face velocity of 0.1m/s and their trajectories are calculated via the Lagrangian method. Contributions of particle collection efficiency via the inertial impaction and interception are simulated and discussed with respect to the available data in the literature.

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