عنوان مقاله:

Eulerian Lagrangian Simulation of Particle Capture and Dendrite Formation on Binary Fibers

محل انتشار:

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خلاصه مقاله:

The capture efficiency of the small aerosol particle is strongly influenced by the structure of fibrous layers. This study presents particle deposition and dendrite formation on different arrangements of binary fibers. 2-D numerical simulation is performed using the open source software of OpenFOAM. In the instantaneous filtration of a single fiber, obtained results are in good agreement with the existing model. Results showed that addition of nanofiber to microfiber led to high capture efficiency for the particle size 50nm at the cross arrangement with fibers distance 2µm. When particle gets larger, i.e. 150 nm, binary fibers have higher capture efficiency and pressure drop than the single microfiber at all arrangements, especially for the fibers distance 1.5 µm. Therefore, the good fibers arrangement here seems the cross arrangement with the high capture efficiency, average pressure drop and fibers distance 2 µm.

کلمات کلیدی:

BinaryFibers, Eulerian, Lagrangian, Dendrite Formation, Deposition Mechanisms