

GRANULAR FILTRATION OF AIRBORNE CARBON NANOTUBES

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This work aims at understanding the granular filtration mechanisms of single-walled carbon nanotubes. Experimental studies were conducted with a glass beads in a straight column, and the lengths of the nanotubes were about 1- 100 μm . The granular beads were homogenous (2, 4 and 6 mm in diameter) and the tested air face velocities were 12.0, 16.8 and 25.0 cm/s. Results showed the overall granular bed filtration efficiency decreases with increasing particle size, which indicated that the dominant mechanism is Brownian diffusion. Four models were compared with the experimental results of filtration of carbon nanotubes. The UBE model had a good agreement with the experiment results of 2 mm glass beads. And Tardos's model fitted the experiment results better with the results for 4 mm and 6 mm glass beads.