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Experimental Study of Aerosol Filtration by Fibrous Filters*

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Abstract

Submicron aerosol filtration by fibrous filters has been studied experimentally employing a filter efficiency measuring technique based on the use of moderately monodisperse aerosols and an electrical aerosol detector. Using this technique, the filtration efficiencies of filters made of uniformly sized fibers have been measured by the use of particles in the 0.035–1.3 μm diameter range. Filter solidity has ranged from 0.0086 to 0.42. Filtration velocity has been varied between 1 and 300 cm/sec. The results of the measurement have been compared quantitatively with the available theories. It has been found that theories taking into account the interference effect of neighboring fibers are in reasonable agreement with the experiments.

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