

Microstructural Characterization in Commercial PM_{2.5} Air Filter Media

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Abstract

Air pollution of particular matter with particle sizes below 2.5 μm (PM_{2.5}) is more and more serious, detrimentally affect not only life quality but also human health. Improving both collection efficiency and pressure drop is expected for air filter media. In this study, we examine two distinctly commercial PM_{2.5} filter media with respect to filtration performance, filter material characterization, and filtration mechanism. Three-dimensional (3D) transmission x-ray microscopy (TXM) tomography is employed to understand the morphology and geometry of fiber characterization in those two filter media. Our findings suggest priority parameters of fibrous materials in designing efficient air filter media for specific applications.

Keywords: fibrous filter, electret filter, aerosol, porosity, X-ray tomography