

Filtration characteristics of carbon nanotubes and preparation of buckypapers

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ABSTRACT

Membrane filtration is often used in purification of carbon nanotubes and in preparation of their thin films (buckypaper). Filtration characteristics of multiwall carbon nanotubes (MWCNT) suspended in aqueous solution of detergents was investigated in this study. Although the diameter of the MWCNT was estimated at around 50 nm from the scanning electron micrograph, a microfiltration membrane whose nominal pore size was 0.2 μm retained the carbon nanotubes. The specific resistance of the filter cake of the carbon nanotubes was $7 \times 10^{13} \text{ m kg}^{-1}$ at 98 kPa and the compressibility index was 0.12. The carbon nanotubes were entangled in the buckypaper formed on the microfiltration membrane and the internal structure of the buckypaper was similar under the applied pressure in the preparation of 10–98 kPa.

Keywords: Carbon nanotube; Membrane filtration; Microfiltration; Filtration characteristics; Buckypaper
