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Diameter distribution and synthesis of high quality double-walled carbon nanotubes by a catalytic decomposition of the tetrahydrofuran.

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Double-walled carbon nanotubes (DWCNTs) have attracted much attention in recent years because of their electronic properties compared to those of multi-walled carbon nanotubes (MWCNTs) and single-walled carbon nanotubes (SWCNTs). Recent study indicated that DWCNTs possess excellent field emission properties, low threshold voltage for electron emission as SWCNTs and a good emission stability similar to that of MWCNTs(1).

High-quality DWCNTs have been produced by a catalytic decomposition of tetrahydrofuran from Fe-Mo/MgO catalyst at 800 °C. The produced carbon materials, DWCNT bundles have high crystallinity, clean surfaces, and clean inside layer. The microstructure of the as-synthesis DWCNTs was characterized by a high-resolution transmission electron microscopy (HRTEM) and Raman spectroscopy(1064nm wavelength from Nd-YAG laser). The as-synthesis DWCNTs show corresponding peaks from Raman spectra of the radial breathing mode (RBM). The outer and inner tube diameters of the DWCNTs are in the range of 1.4-2.5nm and 0.7-1.8 nm. Moreover, the interlayer spacing of DWCNTs is not a unchangeable, ranging from 0.35 to 0.40 nm.

[참고문헌]

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