

Purification of Carbon Nanotubes: Alternative Methods

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Abstract

Traditional carbon nanotube purification process involves nitric acid refluxing and cross flow filtration using surfactant TritonX. This is believed to result in damage to nanotubes and surfactant residue on nanotube surface. Alternative purification procedures involving solvent extraction, thermal zone refining and nitric acid refluxing are used in the current study. The effect of duration and type of solvent to dissolve impurities including fullerenes and PACs (polyaromatic compounds) are monitored by nuclear magnetic resonance, high performance liquid chromatography, and thermogravimetric analysis. Thermal zone refining yielded sample areas rich in nanotubes as seen by scanning electric microscopy. Refluxing in boiling nitric acid seem to improve the nanotube content. Different procedural steps are needed to purify samples produced by laser process compared to arc process. These alternative methods of nanotube purification will be presented along with results from supporting analytical techniques.