A approach to purify carbon nanotube by using laser treatment

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ABSTRACT

Currently the cultural heritage for purification the way to carbon nanotube to mainly have the Gas phase oxidation, Liquid phase oxidation and the Size exclusion chromatography, among them, the Size exclusion chromatography and Liquid phase oxidation both can't do carbon powder valid of purification. The Gas phase oxidation is amorphous carbon or carbon grain heat or use the plasma to purification for the direct usage stove, although heat's oxidizing can clean a great deal of the carbon residue or the carbon grain and get the rather high and pure of carbon tube, the carbon tube produces was rate low(about 10%), and use the plasma to purification to need the expensive equipment and consume material, and make carbon nanotube production costincreased. Infrared laser has been used to irradiate carbon nanotube (CNT) powders for the first time and the performance of CNT emitter was enhanced. The CNTs were prepared by conventional electric arc discharge method and laser irradiation was processed by Nd:YAG infrared laser with a wavelength of 1064 nm. It was found that the turn-on electric field was significantly decreased for laser treated sample. Possible mechanism is discussed here.

Keywords : Carbon nanotube,Gas phase oxidation,Liquid phase oxidation,Size exclusion chromatography, Infrared laser

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