



Iranian Journal of Physics Research, Vol. 15, No. 4, 2016

Research note

A survey of conductivity of nanotubes indirectly doped with nitrogen using equations Kramerz-Kronig

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(Received 23 April 2014 ; in final form 17 June 2015)

Abstract

Doping of carbon nanotubes with nitrogen should provide more control over the nanocarbon electronic structure. In addition to the chemical and arc-discharge alternative methods used nowadays, we suggest ion irradiation as an alternative way to introduce N impurities into nanotubes. The impinging ions can directly occupy the sp^2 positions in the nanotube atomic network. As an alternative way N nitrogen atoms are introduced due to the same atomic radius. In this work we studied the defects caused by exposure to N_2 with various energies with the Raman spectroscopy. Kramers–Kronig analysis determined the optical conductivity σ of multiwall carbon nanotubes. Electrical measurements showed that conductivity of samples increases with enhancement of irradiation of MWCNTs, clearly due to creation of more defects and N-C and irradiation-mediated doping of nanotubes is a promising way to control the nanotubes electronic structure.

Keywords: carbon nanotube, electricity conductor, FTIR, Raman

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