

Tuning electrical and optical properties of SWCNT films

A.A. Tonkikh ^{1,*}, V.I. Tsebro ^{2,3}, I. I. Kondrashov ¹, V.A. Eremina ¹, E.A. Obraztsova ^{1,4}, A.S. Orekhov ^{5,6}, E.I. Kauppinen ⁷, A.L. Chuviln ^{8,9}, E.D. Obraztsova ¹

¹ *A.M. Prokhorov General Physics Institute, RAS, 38 Vavilov Street, 119991 Moscow, (Russia)*

² *P.N. Lebedev Physical Institute, RAS, 53 Leninsky Prospect, 119991 Moscow, (Russia)*

³ *Kapitza Institute for Physical Problems, RAS, 2 Kosygina Street, 119334 Moscow, (Russia)*

⁴ *Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry, RAS, 16/10 Miklukho-Maklaya Street, 117871 Moscow, (Russia)*

⁵ *National Research Center "Kurchatov Institute", 123182 Moscow, (Russia)*

⁶ *Electron Microscopy for Materials Science (EMAT), University of Antwerp, 2020 Antwerpen, (Belgium)*

⁷ *Depart. of Applied Physics, Aalto University, School of Science, P.O. Box 15100, FI-00076 Espoo, (Finland)*

⁸ *CIC nanoGUNE Consolider, Tolosa Hiribidea 76, 20018 Donostia-San Sebastian, (Spain)*

⁹ *IKERBASQUE Basque Foundation for Science, Maria Diaz de Haro 3, E-48013 Bilbao, (Spain)*

*Corresponding author. E-mail: aatonkikh@gmail.com.

Single-wall carbon nanotubes (SWCNTs) exhibit a unique set of electro physical and optical properties such as: a high mobility of charge carriers, a ballistic transport along the nanotube axis, linear and non-linear optical effects, and et al. Unfortunately, these properties are inherent only to the individual SWCNTs. The merge of individual SWCNTs into the films usual cause the loss of all the advantages inherent in individual SWCNTs. So, for the making of conductive electrode, FED devises, photodetectors, transistors and thermoelectric devises these issues have to be overcome.

In the work we exhibited the investigation devoted to tuning and improvement properties of SWCNT films via the filling of interior channels with acceptor or donor molecules. The effects of control doping on SWCNTs merged into the conductive networks were investigated by optical spectroscopes (Raman and optical absorptions) and electrophysical methods (setups of 4-probe sheet resistance and thermopower measurements). The filling and measurements were carried out on films composed of nanotubes of narrow and wide diameter distribution, including extracted semiconductor and metal ones.

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