NANO KOREA 2008
The 6th International Nanotech Symposium & Exhibition

Nanotechnology for the Sustainable World

August 27 (wed.) - 29 (fri.) / 3days

Host
Ministry of Knowledge Economy(MKE)
Ministry of Education, Science Technology(MEST)

Organizer
NANO KOREA Organizing Committee
NanoTechnology Research Association(NTRA)
Korea Nanotechnology Research Society(KoNTRS)
Korea Institute of Science Technology Information(KISTI)

Supported by
Gyunggi-do, The Electronic Times
Korea Science Foundation(KSF)
Electrical Characteristics of Field-Effect Transistor using Thin Multi-Walled Carbon Nanotubes and Poly (methyl methacrylate) Composite

S. W. Bae, S. H. Kim, Y. B. Lee, Y. D. Han, K. Kim, and J. Joo*

Department of Physics and Hybrid Nanostructure Research Lab, Korea University
Fax: +82-(02)-927-3292 E-mail address: jjoo@korea.ac.kr

The carbon nanotube (CNT) transistors using aligned CNTs or their random networks configuration have been intensely investigated.\textsuperscript{1,2} We fabricated the field-effect transistor (FET) using thin multi-walled carbon nanotubes (t-MWCNTs) and poly (methyl methacrylate) (PMMA) composites as an active layer, as shown in Fig. 1. The t-MWCNTs were dispersed in toluene with PMMA, and the composites were homogeneously dispersed through high-power sonication. This composite solution was spin-coated on the FET pattern. To confirm formation of the t-MWCNTs networks, we utilized scanning electron microscope (SEM). We measured current-voltage ($I-V$) characteristics of t-MWCNTs varying weight % with respect to PMMA. The typical p-type characteristics were observed for the FET with long channel length (≥ 5μm). We measured temperature dependence of $I-V$ characteristics as a function of gate voltages, on/off ratio, and carrier mobility. The activation energy obtained from temperature dependent mobility was discussed.

![Spin coated t-MWCNTs & PMMA Composite Layer](image)

**Figure 1.** The structure of a FET using t-MWCNTs and PMMA composite

References
