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## Abstract Book

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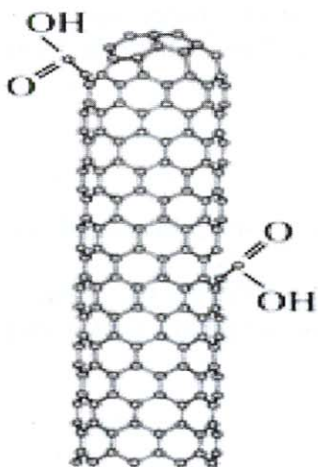
## **Polypyrrole and Poly (3-hexylthiophene) Nanowire Composites with Functionalized Single-Wall Carbon Nanotubes as Dopant**

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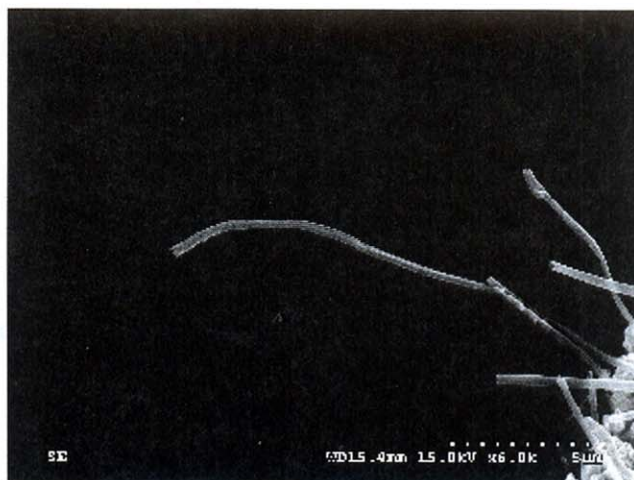
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Single-wall carbon nanotubes (SWCNTs) were functionalized [1] to synthesize polypyrrole (PPy) and poly (3-hexylthiophene) (P3HT) nanowires [2] through electrochemical polymerization method. SWCNTs were ultrasonicated for 24 hr in a mixture of concentrated nitric and sulfuric acid. The functionalized SWCNTs were used as dopants due to the carboxyl acid groups (-COOH). By using the functionalized SWCNTs, PPy and P3HT nanowires were electrochemically polymerized in the nanoporous membrane without conventional dopants. We confirmed the functionalized SWCNTs, PPy, and, P3HT nanowires through a scanning electron microscope, a tunneling electron microscope, a Fourier transformation of infrared spectroscopy (FT-IR), and a Raman spectroscopy. The electrical, optical, and structural properties of PPy and P3HT nanowire composites with functionalized SWCNTs were compared with these prepared by using conventional dopants.



**Functionalized SWCNT**



**PPy SEM image**

### **References**

1. Joseph Wang, Jinhua Dai, and Travis Yarlagadda, *Langmuir* **21**, 9-12 (2005).
2. J. Joo, K. T. Park, B. H. Kim, M. S. Kim, S. Y. Lee, C. K. Jeong, J. K. Lee, D. H. Park, W. K. Yi, S. H. Lee, and K. S. Ryu, *Synthetic Metals* **135-136**, 7-9 (2003).