Electrical Conductivity of Transparent Single-Walled Carbon Nanotube Films on Flexible Polymer Substrates

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We developed a simple and practical method to improve the electrical conductivity as keeping the optical transmittance of single-walled carbon nanotube (SWNT) films. In order to achieve an enhanced conductivity of transparent SWNT films, we carried out the formation of gold nanoparticles onto the SWNT networks which manufactured by the vacuum filtration method. The reduction method is a kind of the wet chemistry and very simple process, just immersion prepared-SWNT films into an ethanolic aqueous solution of gold salt for several minutes. We determined the optimum conditions to form the gold nanoparticles onto the SWNT networks as following. After the formation of gold nanoparticles, the electrical conductivity was enhanced to ca. 100 % of the initial conductivity and maintained the visible light transmittance over 80 %.