

Hybrids of carbon nanotubes and metal nanoparticles for their potential applications as transparent conducting films

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The use of carbon nanotubes (CNTs) as transparent conducting films is one of the most promising aspects of CNT-based applications due to their high electrical conductivity, transparency, and flexibility. However, despite many efforts in this field, the conductivity of carbon nanotube network films at high transmittance is still not sufficient to replace the present electrodes, indium tin oxide (ITO), due to the contact resistances and semi-conducting nanotubes of the nanotube network films. Here, we investigated the electrical conductivities of single-walled carbon nanotube (SWNT) network films upon pre- and post-treatment via gold ions, particularly with respect to their potential use as transparent conducting films. Transparent conducting SWNT films using pre- and post-deposition of gold nanoparticles resulted in a significant decrease of the electrical resistance, while the initial value of the transmittance of pristine-SWNT films was maintained.