

## **Transparent Conductive Single-Walled Carbon Nanotube Films Manufactured by adding carbon nanoparticles**

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**Abstract** : Although a transparent conductive film (TCF) belongs to essential supporting materials for many device applications such as touch screens, flat panel displays, and sensors, a conventional transparent conductive material, indium-tin oxide (ITO), suffers from considerable drawback because the price of indium has soared since 2001. Despite a recent falloff, a demand of ITO is expected to increase sharply in the future due to the trend of flat panel display technologies toward flexible, paper-like features. There have been recently extensive studies to replace ITO with new materials, in particular, carbon nanotubes (CNTs) since CNTs possess excellent properties such as flexibility, electrical conductivity, optical transparency, mechanical strength, etc., which are prerequisite to TCFs. This study fabricated TCFs with single-walled carbon nanotubes (SWCNTs) produced by arc discharge. The SWCNTs were dispersed in water with a surfactant of sodium dodecyl benzene sulfonate (NaDDBS) under sonication. Carbon black and fullerene nanoparticles were added to the SWCNT-dispersed solution to enhance contact resistance between CNTs. TCFs were manufactured by a filtration and transfer method. TCFs added with carbon black and fullerene nanoparticles were characterized by scanning electron microscopy (SEM), UV-vis spectroscopy (optical transmittance), and four-point probe measurement (sheet resistance).

**Key Words** : carbon nanotube, transparent conductive film, nanoparticle, surfactant