

Electrochemical properties of multi-walled carbon nanotubes as the electrode materials

**Sookhyun Hwang¹, Joonhee Moon¹, Hoonha Jeon¹, Kyoungseok Noh¹, Chiyong Park¹,
Jaekyu Kim¹, Sooyeon Lee¹, Minhyon Jeon^{1†}, Dongyun Lee²**

¹Department of Nano System Engineering, Institute of Nano Manufacturing, Inje University, 621-749, Korea

²Electric and Magnetic Devices Group, Korea Electrotechnology Research Institute, Korea

Carbon nanotubes (CNTs) are investigated as new counter electrode materials for application such as dye-sensitized solar cell (DSSC) instead of Pt electrode. CNTs have many advantages for counter electrode: a high catalyst property, a spacious surface area, low resistivity, etc. We have studied multi-walled CNTs (MWCNTs) grown on p-type silicon substrate as a possible candidate for the counter electrode. MWCNTs are made through the thermal chemical vapor deposition method. Impedance spectroscopy is used to investigate electrochemical properties of CNTs. It is found that CNTs electrode is indicated as a good redox catalyst for DSSC because it has high electrical conductivity and low interfacial resistance between electrolyte and CNTs. It is possible to use MWCNTs as electrode material for dye-sensitized solar cell.

Keywords Carbon nanotube, thermal chemical vapor deposition, counter electrode, electrochemical property, dye-sensitized solar cell