



Title	Fabrication of Transparent Conductive Film of Carbon Nanotube as Touch Panel Matrix Based on Flexible Sheet Material
Author(s)	Wang, Yanqing
Citation	第3回北海道大学サステナビリティ学生研究ポスターコンテスト = The Third Hokkaido University Sustainability Research Poster Contest. 平成23年10月25日（火） - 11月6日（日）. 北海道大学学術交流会館, 札幌市.
Issue Date	2011-10-25
Doc URL	<a href="http://hdl.handle.net/2115/47388">http://hdl.handle.net/2115/47388</a>
Type	conference presentation
Note	Category 3: Sustainable Production & Consumption
File Information	C3-1.pdf



[Instructions for use](#)



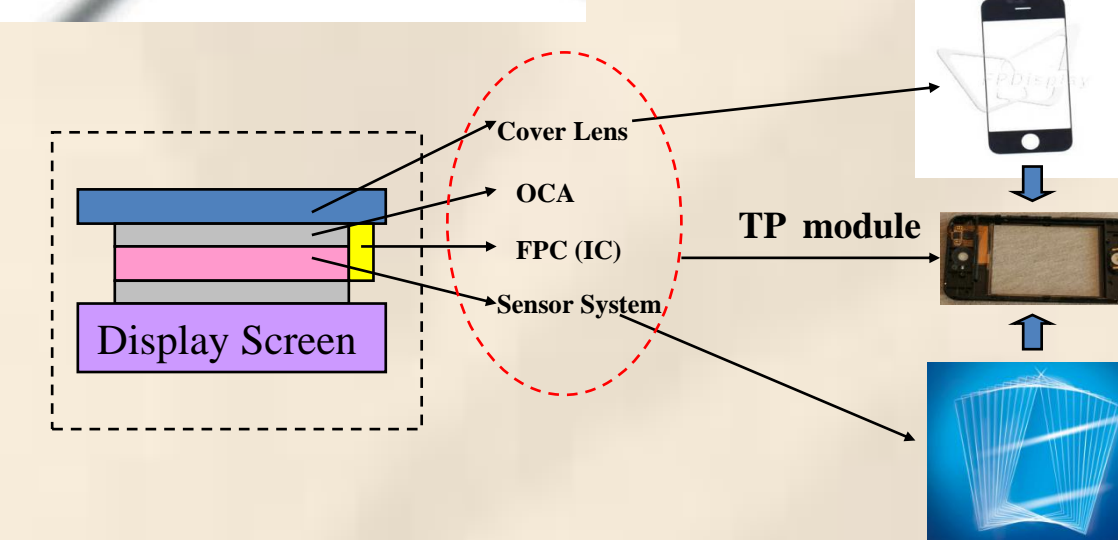
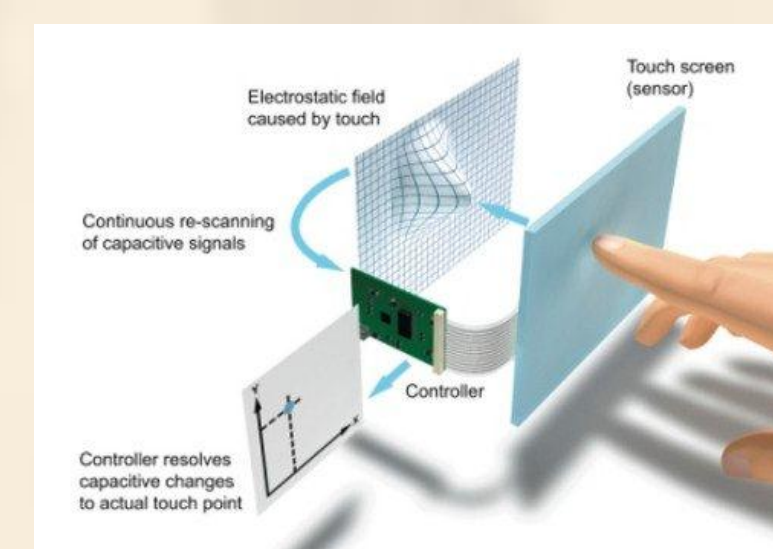
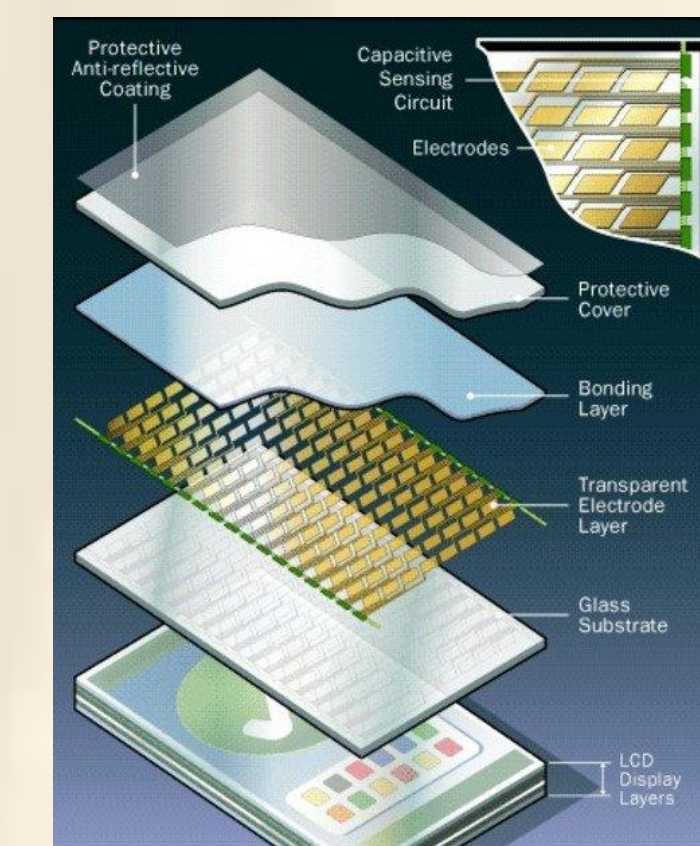
# Fabrication of Transparent Conductive Film of Carbon Nanotube as Touch Panel Matrix Based on Flexible Sheet Material

Yanqing Wang

Graduate School of Environmental Science, Hokkaido University, Japan

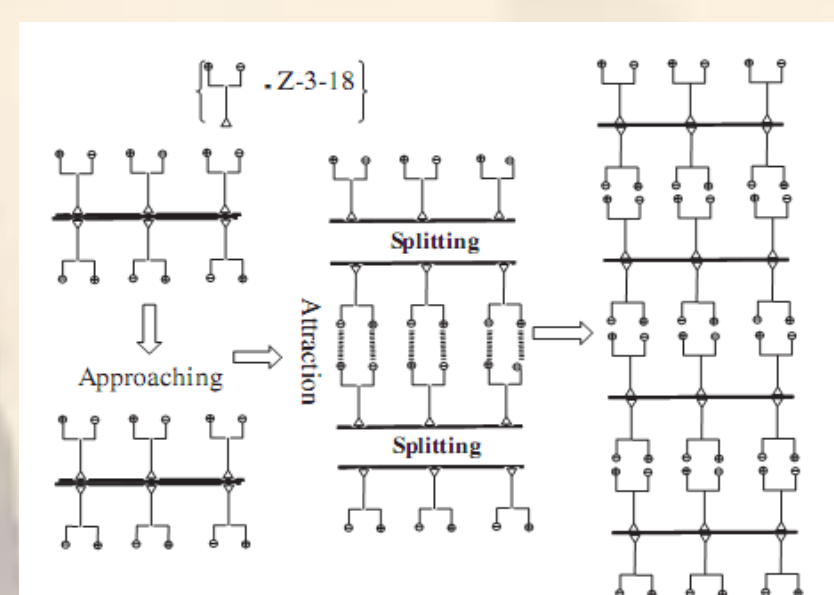
## 1 Introduction

- ◆ Indium tin oxide (ITO) has been the transparent conductor of universal choice for touch screens.
- ❖ Non-ideal, ever-increasing costs of scarce material on the earth
- ❖ Tend to crack with use due to its brittle nature
- ❖ Incompatible with plastic substrates such as polyethylene terephthalate (PET) due to its high-temperature processing
- ◆ Novelty alluring alternative single-walled carbon nanotube (SWCNT) has been researched unprecedentedly over last two decades that stems from advantageous properties.
- ❖ Abundant carbon resource in nature and sustainable
- ❖ Excellent electrical conductivity and transparency
- ❖ Superior mechanical strength (flexibility) and chemical resistance
- ❖ Good adhesion with substrates and wet processing

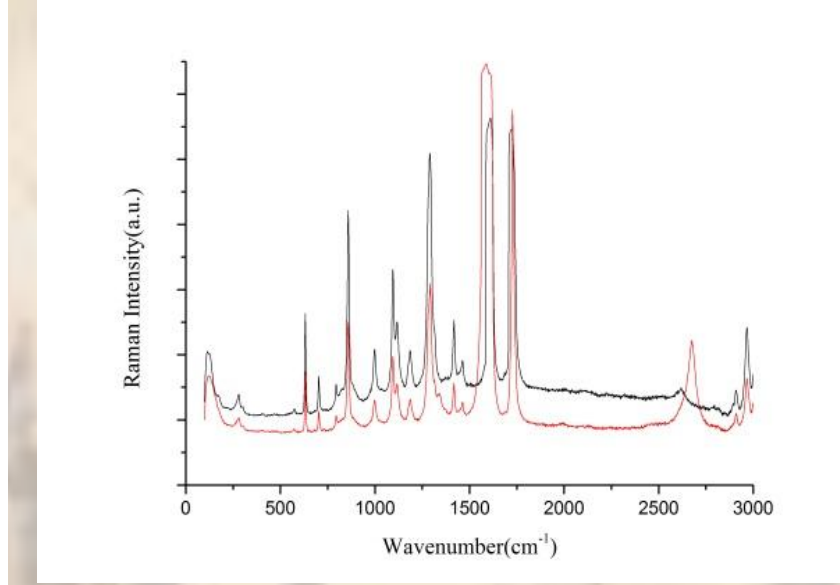
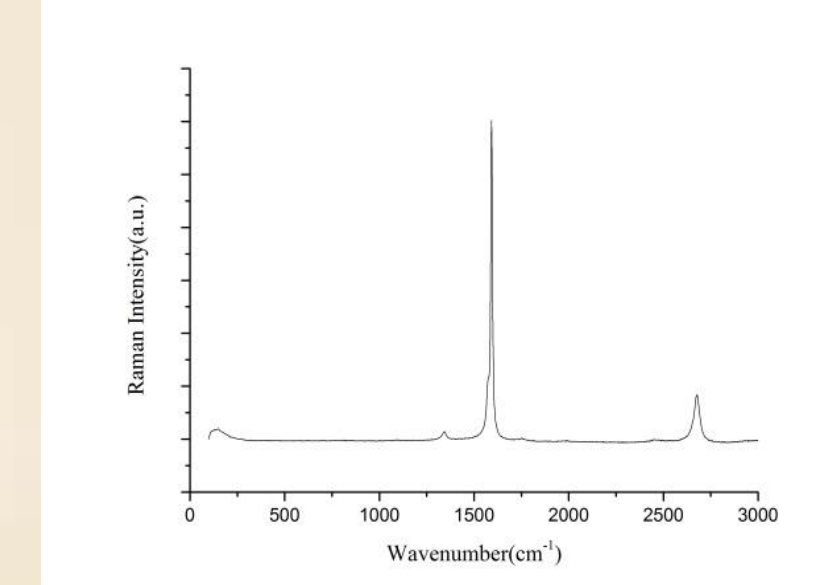
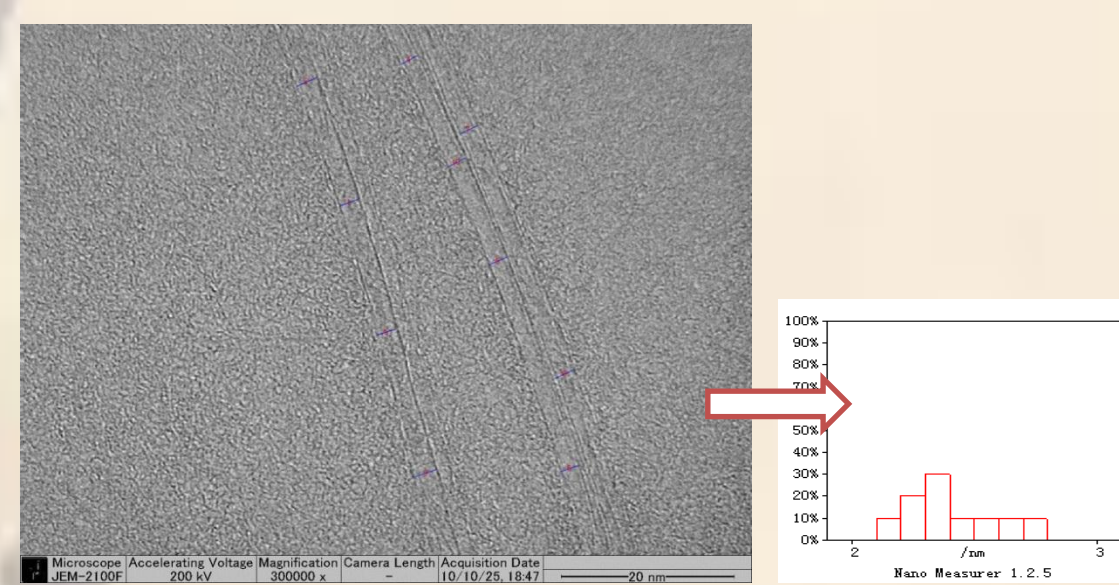
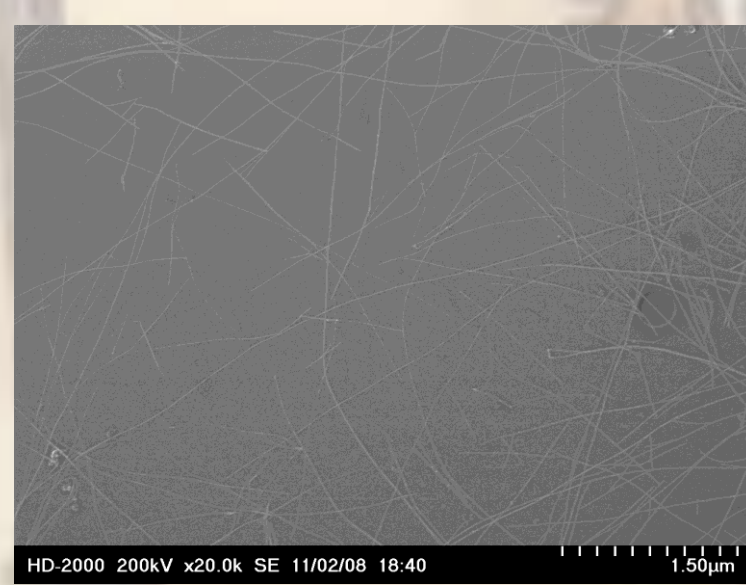


## 2 Methods

- 1 Individual dispersion of SWCNT as reported by our group
- 2 Using bar-coating route to prepare the transparent and conductive film
- 3 Removal of insulator by acid technique
- 4 Post treatment of the obtained film

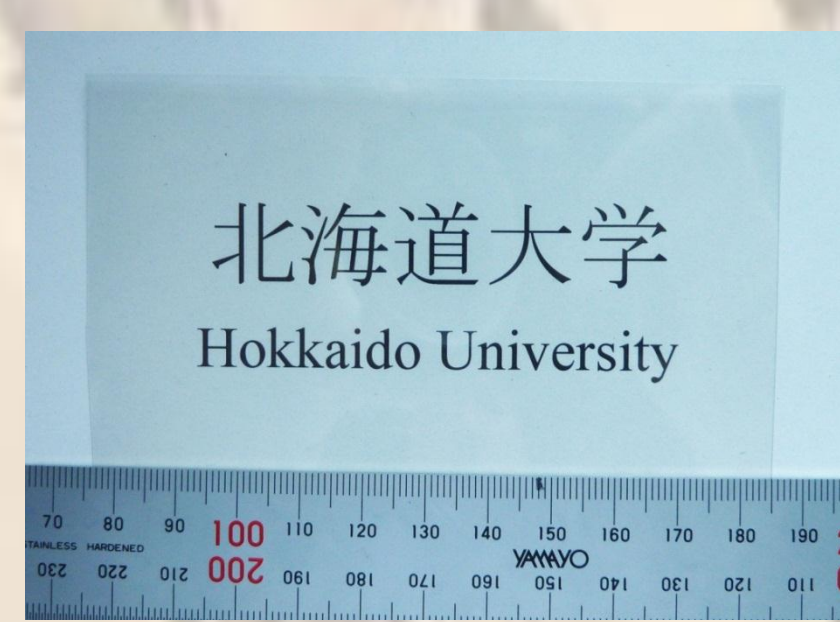
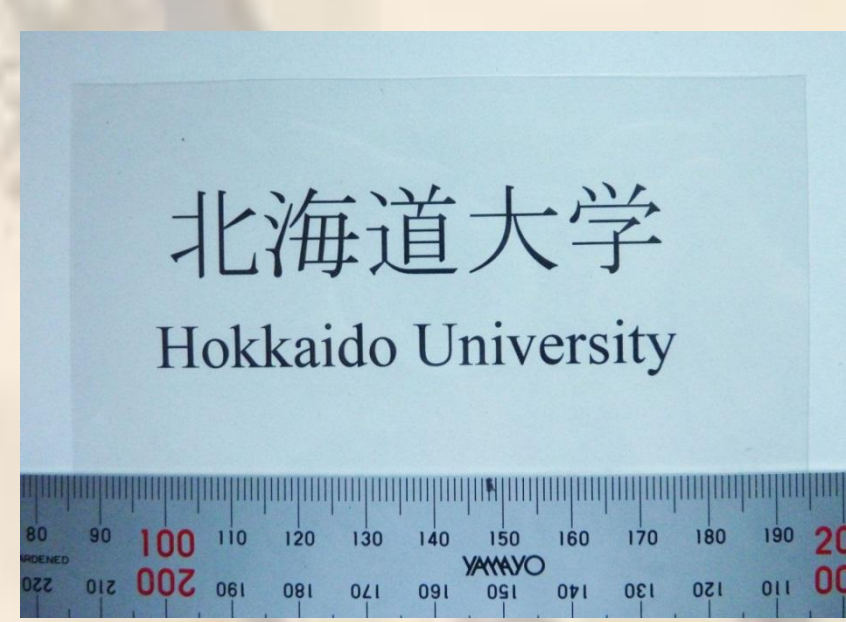


Devising a simple yet powerful method to disassemble the SWCNT bundles(ropes) into individual nanotubes

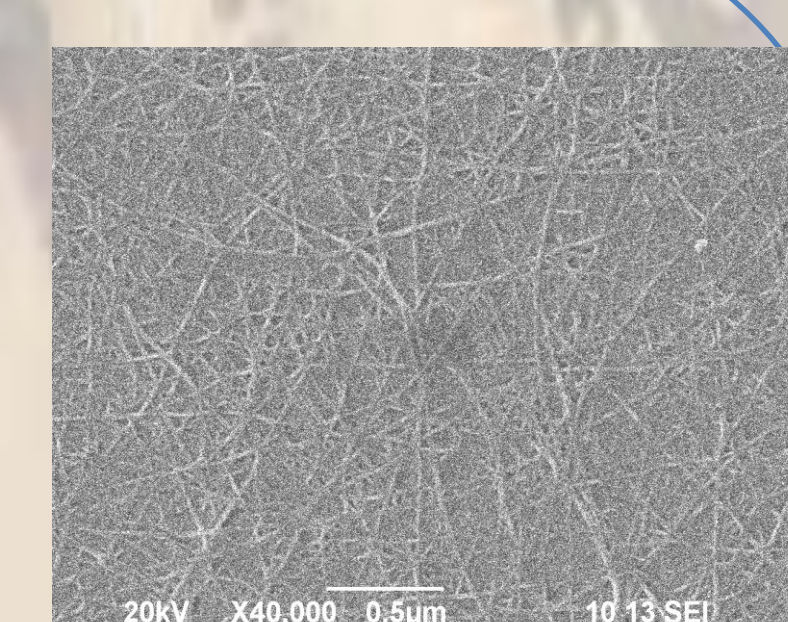
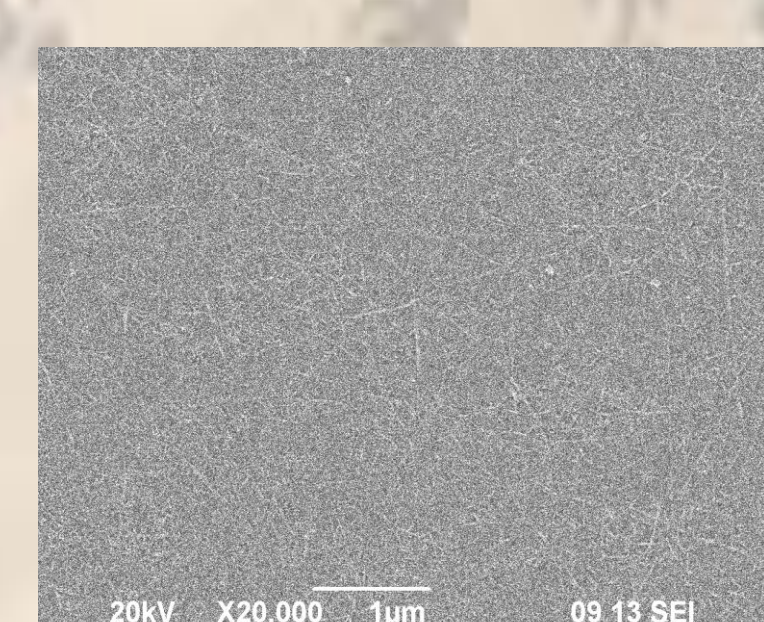


The ideal individual dispersion effect of SWCNT was produced as previous published work of our group Raman response of dispersed SWCNT and SWCNT/PET(red line)

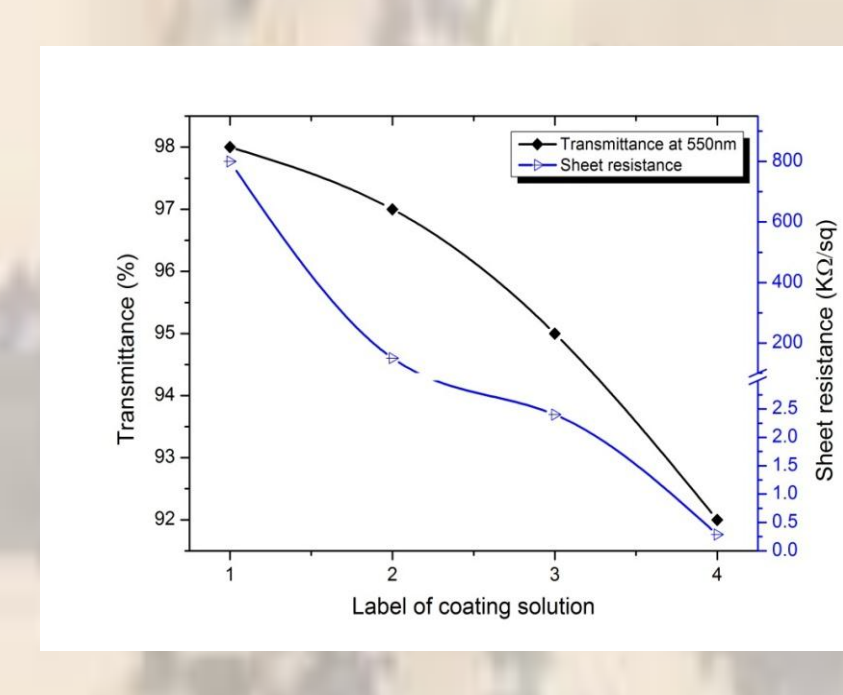
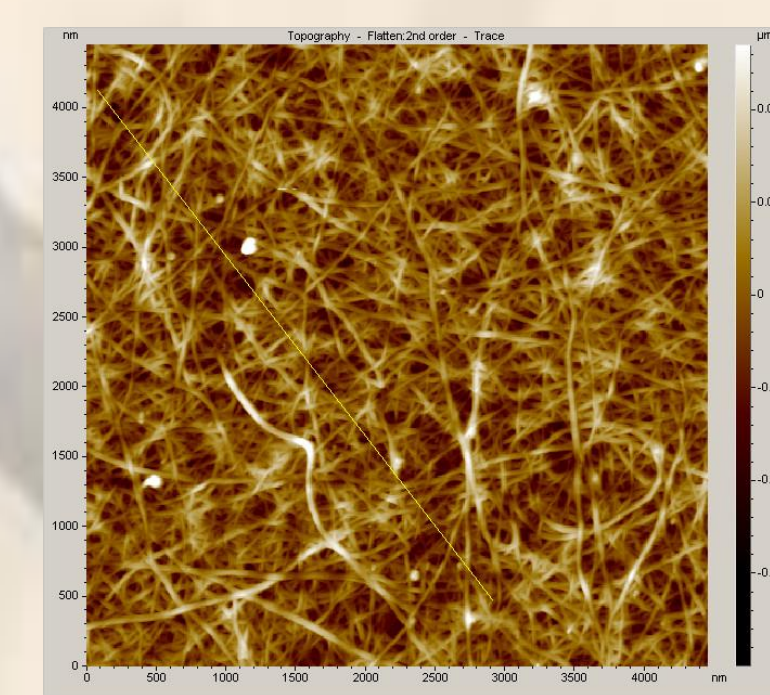
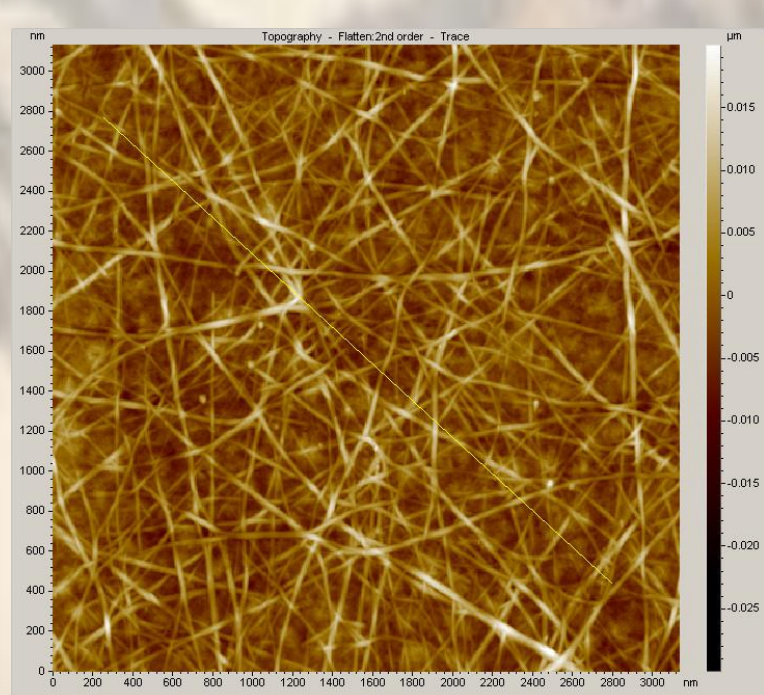
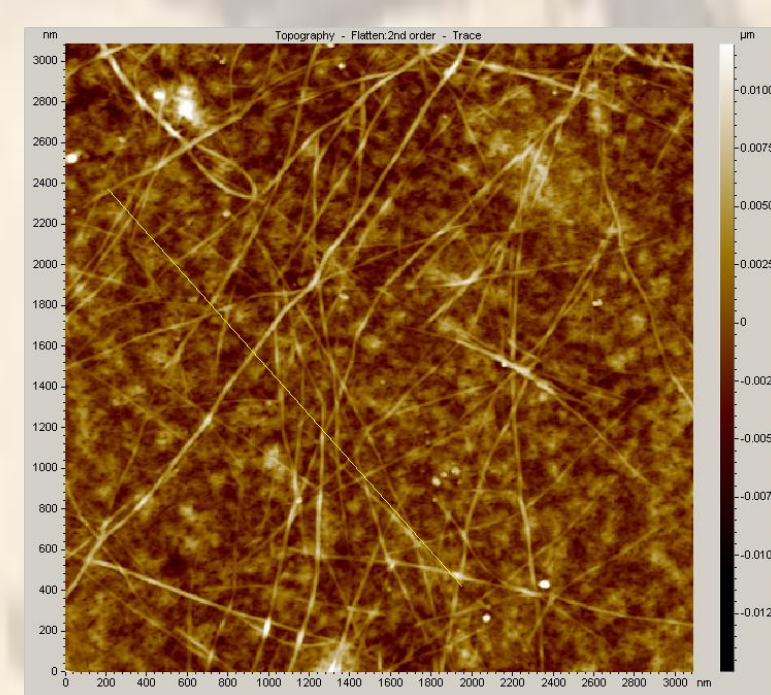
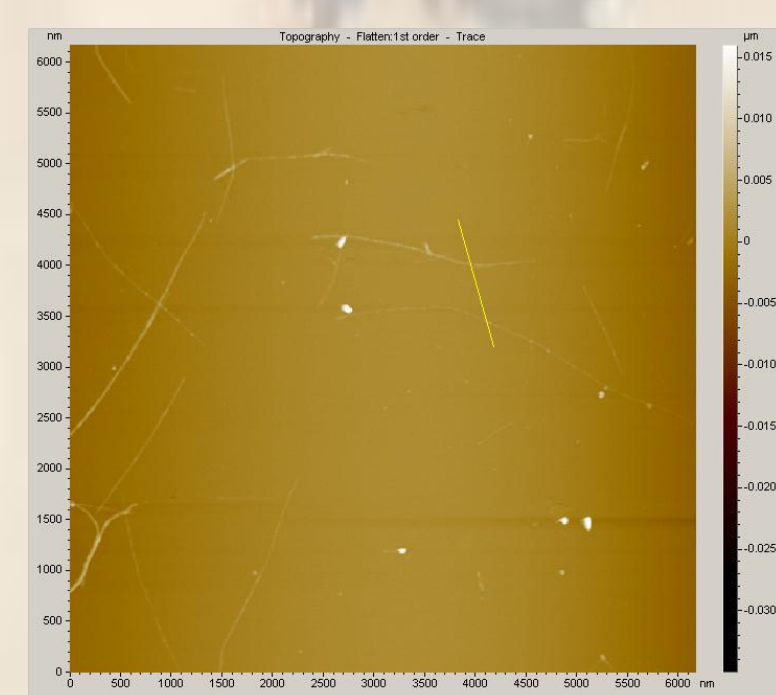
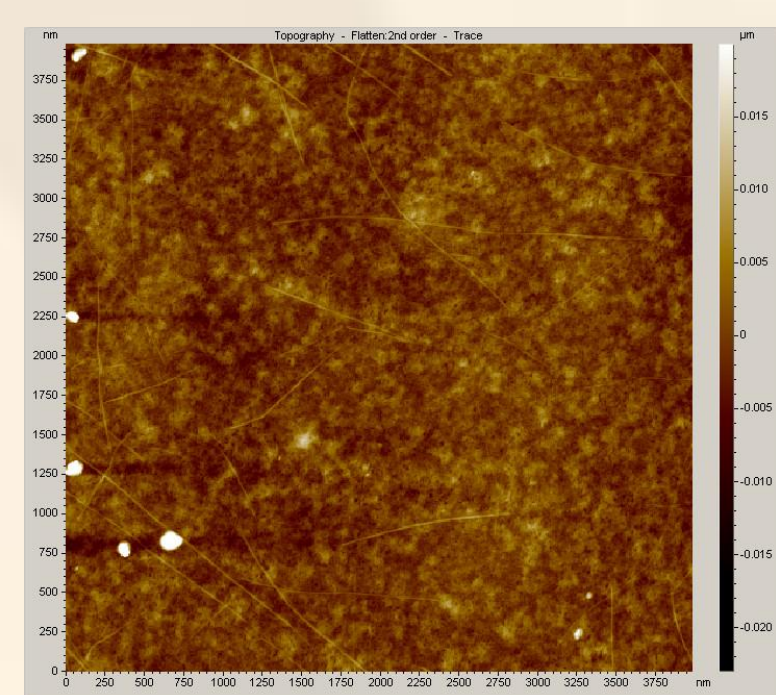
## 3 Results and discussion



Photos of SWCNT/PET films with incremental concentration of dispersion solution 0.001wt%, 0.003wt%, 0.01wt%, 0.02wt%



The homogeneous distribution of SWCNT network coated onto PET substrate was portrayed by SEM.



Transparency and conductivity

Corresponding AFM images of prepared SWCNT/PET films showing the wavy fiber segments

## 4 Conclusions

- 1 Ideal individual dispersion of SWCNT
- 2 Highly electrically conducting thin films were prepared
- 3 Homogeneous feature make sure its transparency and post etching

## 5 References

1. Fugetsu Bunshi et al(2005) Disassembling single-walled carbon nanotube bundles by dipole/dipole electrostatic interactions. Chem Lett.34(9):1218-9.
2. Lee YH et al (2007)Effect of acid treatment on carbon nanotube-based flexible transparent conducting films. JACS.129(25):7758-9.
3. Bao ZN et al(2008) Self-sorted, aligned nanotube networks for thin-film transistors. Science.321(5885):101-4.