

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Free standing carbon nanotubes growth on large-area by nanoimprint and plasma-enhanced chemical vapor deposition.** WON SEOK CHANG, DAE-GEON CHOI, JUN-HO CHUNG, KAB-SOO HUH, KIMM, NEMS TEAM — Among various synthesis methods for carbon nanotube growth, chemical vapor deposition (CVD) method has been widely used for various advantages such as high quality, vertical alignment, controlled diameter and length of nanotubes and so on. Especially, vertically aligned multi-wall carbon nanotube could be grown using plasma-enhanced chemical vapor deposition (PECVD). In this paper, we presented growth of free standing carbon nanotubes by PECVD for the fabrication of nano-electrode. For the growth of nanotubes on the large area 50 mm x 50 mm, catalyst dots were formed by nanoimprint and lift-off process. The synthesis of carbon nanotube requires a metal catalyst layer, etchant gas, and a carbon source. Ammonia (NH<sub>3</sub>) and acetylene (C<sub>2</sub>H<sub>2</sub>) were used as the etchant gas and carbon source, respectively. And iron (Fe) of catalyst metal was deposited on silicon wafer substrates. To form Fe nano dots with diameter of 150 nm and thickness of 50 nm, nano holes patterned imprint resin was used for lift-off process. Carbon nanotubes were grown on pretreated substrates at approximately 30% C<sub>2</sub>H<sub>2</sub>:NH<sub>3</sub> flow ratios for 40 min.

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Date submitted: 26 Nov 2007

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