

Abstract Submitted  
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**Carbon nanotube – catalyst composites: from nano-complexes to aerogel functionalization**<sup>1</sup> GORDANA N. OSTOJIC, MARK C. HERSAM, Materials Science and Engineering Department, Northwestern University — Here we present three different strategies to achieve attachment of catalytic nanoparticles to SWNTs and discuss their physical properties. In nano-complex scheme, DNA that solubilizes SWNTs is used as an anchor for Pt nanoparticle growth. Attached platinum strongly influences nanotube phonon and charge carrier distribution. For macroscopic electrodes, no special chemistry is needed. Simple solubilization of both nanoparticles (Pt) and nanotubes in polar surfactants and joint deposition on a porous membrane will result in charge coupled SWNT/Pt electrode. A particularly difficult problem in SWNT research is a task of electrically connecting nanotubes and at the same time keeping the surface available. We present an innovative solution to this problem in which SWNTs are connected through point contacts that leave the majority of the surface free. This method creates self-assembled carbon nanotube aerogel of a record low density that is both luminescent and conductive. Additional value of this material is that it is suitable for subsequent functionalizations. Platinum and titanium dioxide deposition on aerogel suggests that carbon aerogel can be used as a framework for complex structures.

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