

## Hydrogen Physisorption and Spillover from Array of Platinum Nanoparticles Sputter Deposited on MWNTs

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Surface modification of carbon nanotubes using metal nanoparticles has been recently proposed as an efficient method to enhance their hydrogen storage capacity. Most studied elements in the regards are the light transition metals, such as Ti, V, Ni, Pd etc. Previous studies suggested that in order to efficiently catalyze the hydrogen adsorption, it is important that the metal particles should be on the external surface of the carbon nanotubes. It is envisaged that free metal clusters well-dispersed on the carbon nanotube surface enhances the hydrogen storage capacity via interfacial diffusion of physisorbed hydrogen molecules, i.e., spillover.

Here, we present a comprehensive study of the hydrogen storage characteristics of platinum doped mutli-walled carbon nanotubes. Uniform and well-dispersed array of ultra-fine platinum nanoparticles are obtained by the sputter deposition technique. The hydrogen adsorption characteristics of these nanocomposites ( $2.9 \pm 0.3$  wt%) measured under ambient conditions when compared with that of pristine nanotube samples (0.07 wt%), suggest a 40 times enhancement.