

**(NP-01)**

## A scalable process for production of Multi-walled carbon nanotubes (MWCNTs) by catalytic decomposition of $C_2H_2$ on a $Fe/Al_2O_3$ catalyst

J. H. Cho, S. H. Lee, S. I. Jung and C. J. Lee

Department of Nanotechnology, Hanyang University

Catalytic chemical vapor deposition methods for the mass production of multi-walled carbon nanotubes (MWCNTs) have been developed based on the decomposition of acetylene on well-dispersed metal particles ( $Fe/Al_2O_3$ ) strongly adsorbed on a support. The method for the catalyst preparation and the reaction conditions were optimized in our experiment. The Product yield of the as-synthesized MWCNTs have a high yield of over 3000%. The diameter of the as-synthesized MWCNTs is in the range of 10-30 nm. TEM, Raman and TGA analysis show a low defect level in the atomic carbon structure and have high crystallinity.

Our results indicate that  $Fe/Al_2O_3$  catalyst is useful to a large-scale synthesis of high-quality MWCNTs and  $C_2H_2$  can be very ideal feedstock to synthesize MWCNTs over  $Fe/Al_2O_3$  catalyst. This method can promise mass production of high-quality MWCNTs for many technological applications.