

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Separation of single-walled carbon nanotubes into metallic and semiconducting groups: a simple and large-scale method JING LU, Mesoscopic Physics Laboratory, Department of Physics, Peking University, Beijing 100871, Peoples Republic of China. , Y. MAEDA, Department of Chemistry, Tokyo Gakugei University, Tokyo 184-8501, Japan — Separation of a large number of single-walled carbon nanotubes (SWNTs) into groups each with specifically metallic and semiconducting properties is an extremely important task for technology application. Even though effective methods (1, 2) have been devised, they suffer from drawbacks such as either the yield is low (3) or expense is high (4). In this work, we study the problem from a theoretical approach, we notice that based on the first principles calculations the binding strengths of methylamine to the semiconducting [13, 0] SWNT are only 36~61% of that to the metallic [7, 7] SWNT, which suggests that the amines is much more attractive toward the pure metallic than the semiconducting SWNTs. Therefore starting from as-prepared SWNTs and with the assistance of amines, we achieved SWNTs with enriched metallic properties over semiconducting in a convenient and large-scale manner. References: (1) D. Chattopadhyay, L. Galeska, F. Papadimitrakopoulos, *Journal of the American Chemical Society* 125, 3370 (MAR 19, 2003). (2) H. P. Li et al., *Journal of the American Chemical Society* 126, 1014 (FEB 4, 2004). (3) R. Krupke, F. Hennrich, H. von Lohneysen, M. Kappes, *SCIENCE* 301, 344 (JUL 18, 2003). (4) M. Zheng et al., *Science* 302, 1545 (NOV 28, 2003).

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Date submitted: 06 Dec 2005

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