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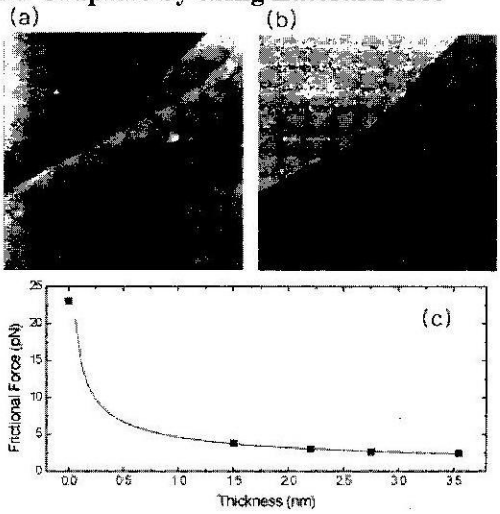
Ep-III-005 Structure and Optical Characteristics of MWCNTs Coated with Light-Emitting Poly 3-hexylthiophene Nanotube

신 지원, 김 기현, 박 동혁, 주 진수
고려대학교 물리학과, 하이브리드나노구조제연구실.

Multi walled carbon nanotubes (MWCNTs) 표면에 전기 화학 중합 방법으로 발광 고분자인 poly 3-hexylthiophene (P3HT)을 코팅 하여 이중벽 구조의 하이브리드 나노 튜브를 제작 하였다. MWCNTs는 n-doped Si 기판에 열 화학 증착(thermal CVD) 방법으로 성장시켰다. 전기화학 중합방법으로 발광 고분자인 poly 3-hexylthiophene (P3HT)을 MWCNT 표면에 성장시켰다. 하이브리드 MWCNT/P3HT와 MWCNTs, P3HT를 각각 유기 용매에 분산 시킨 후 구조적 특성을 알아보기 위해 주사 전자 현미경, 자외선(UV-Vis) 흡수 특성 곡선, Micro Raman 특성 곡선을 측정, 분석하였다. 그리고 LCM Raman, 고분해능 전자 투과 현미경을 통해 한 가닥 나노튜브의 구조적 특성을 분석하였다. 광학적 특성 조사를 위해 용액 상태에서 PL 특성 곡선과 LCM PL 특성 곡선을 측정하여 비교, 분석하였다.

Ep-III-006 Comparison of Frictional Force on Graphene and Graphite by using Lateral Force Microscopy

LEE Hyunsoo, YONG Hyeondeuk, LEE Sangwook[1], SEO Yongho
Faculty of nanotechnology & advanced material engineering, Sejong University, Seoul 143-747, South Korea. [1]Department of Physics, Konkuk university, Seoul 143-701, Korea.



We have studied frictional force on graphene and graphite which were prepared by "scotch tape method" on Si wafer with a HOPG and graphite powder. Lateral force microscopy was used to measure frictional force between the end of SiN tip and surfaces of graphene/graphite and substrate in air. Furthermore, we measured lateral force on the same samples in pure water by using LFM. The frictional force on single-layer of graphene was larger than that on multi-layer graphite and smaller than that on Si oxide both in air and in water. The force spectroscopy was also performed to measure the van der Waals force of the samples. The frictional force strength showed logarithmic behavior as a function of the increased scan velocity. However, there was no connection between the normal force acting on the surface and the frictional force strength if normal force was much weaker than the attractive force. Figure 1 shows representative topographic (a) and LFM (b) images of multi-layers of graphene measured simultaneously with a SiN cantilever in air. (c) The frictional forces were measured as a function of the thickness of the graphite film.