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they can be used in NIR thermal therapy of tumors and drug delivery. In addition to spectral tunability, biomolecules are easily conjugated to Au nanoshells and it provides the capability of tumor cell targeting.

Ep3-090 **Controlled growth of silicon oxide nanowires on Si substrates using Au and Au-Pd catalysts**

박 현규, 양 비룡, 김 상우, 김 길호¹, 윤 두협², 김 상협², 김 기철², 맹 성렬²(¹금오공과대학교 신소재시스템공학부. ²성균관대학교 정보통신공학부. ²한국전자통신연구원.) In this work, we report amorphous SiOx nanowires directly grown on Si substrates via a solid-liquid-solid formation mechanism. Au-Pd and Au thin films (3 nm) deposited on Si (001) and (111) substrates were used as catalysts for growth of nanowires. High-yield synthesis of SiOx nanowires was simply achieved by heating (1050-1150°C) in an Ar-ambient atmosphere without introducing any additional Si source materials. The grown nanowires were characterized by FE-SEM, EDX, and HR-TEM measurements. Morphology and composition of the amorphous SiOx nanowires with diameters of 10-100 nm and lengths of a few - tens of micrometers could be easily controlled by as a function of growth conditions including substrates, catalysts, heating temperatures, and processing time.

Ep3-091 **Metallization Scheme for Electrical Transport in Self Assembled Large Scale Carbon Nanotube Array**

박 정훈, 이 병양, 홍 승새, 홍 승훈, 박 윤(서울대학교 물리학과.) We report on an investigation of various metallization schemes to self assembled large scale carbon nanotube arrays. Reliable and robust metallization scheme to realize ohmic contacts to single wall carbon nanotubes (swCNT) by metallic thin films is an important technological step for the realization of swCNT-based nanoelectronics and their applications. Although electrical contacts to individual swCNT by Cr, Ti and Pd have enabled observations of ballistic electron transport in swCNTs, a systematic study of metallization and the resulting electrical properties for self assembled large scale CNT array has been limited. Self assembled large scale CNT arrays have technological advantages for mass-production of swCNT-based devices. Large scale CNT arrays are selectively patterned by self-assembly on areas defined by lithographic methods. Metallization and electrical properties of resulting contacts are studied by patterning submicron contact areas to 2 mm wide CNT

array elements by e-beam lithography followed by e-beam evaporation of potential contact metals. We will report on the resulting electrical properties of the contacts from utilizing differing materials and annealing conditions.

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†parkyd@phy.snu.ac.kr

Ep3-092 **Photocurrent of CNT-incorporated polymer**

유 세기, 김 진영, 이 형숙, 허 정나¹, 정 태원¹, 이정희¹, 진 용완¹, 김 종민¹(¹한국의국어대학교 물리학과. ¹삼성종합기술원 전자방출원연구원.) Photoemission current of carbon-nanotubes-(CNTs)-incorporated polymer was observed. Single-walled CNTs were dispersed on the substrate, or CNT paste was printed on the substrate. On CNTs polymers were spin-coated and dried in the vacuum furnace. The sample was positioned on the vacuum chamber, and photoemission current was measured using visible light. Photoemission current of polymer-CNTs was greatly enhanced for the case of the single component, i.e., CNT only. The underlying mechanism for this amplification of photoemission will be explained in the poster.

Ep3-093 **Photoluminescence of light emitting polythiophene and its derivatives nanotubes**

조 미연, 박 동혁, 주 진수(¹고려대학교 물리학과.) π -공액 구조를 갖는 polythiophene (PT) 나노튜브와 그 유도체인 poly (3-methylthiophene) (P3MT) 나노튜브를 나노기공 템플레이트인 Al₂O₃를 사용하여 전기화학적 증합방법으로 합성하였고, photoluminescence (PL)를 관찰하였다. PT와 P3MT 나노튜브는 SEM과 TEM 사진으로부터 직경 100~200 nm, 두께 10 nm, 길이 ~40 μ m인 나노튜브 형태로 합성되었음을 확인하였다. PT와 P3MT 나노튜브 증합 시 사용되는 도판트 (TBAPF₆, TBABF₄, CSA, DBSA)와 합성온도, 나노기공 템플레이트를 녹이는 용매 (HF 혹은 NaOH)를 달리하여 π - π^* 천이, 바이폴라론 봉우리 등 물리적 특성을 조절하였다. 도핑 정도가 높은 나노튜브의 PL 봉우리가 청색 천이 현상을 보이는 등, 도핑 정도에 따라 나노튜브의 PL 크기 변화를 관찰하였다.

Ep3-094 **전기 화학적으로 합성되어 O₂ 플라스마 처리된 니켈 나노와이어의 전계방출 특성 연구**

이 선정, 박 동혁, 김 현승, 주 진수, 이 철진¹, 이 연희², 김