



2008 첨단과학기술전문가회의

Korea Conference on Innovative Science and Technology 2008

Electronic Properties of Carbon Based Materials

October 18(Sat) – 21(Tue), 2008
Phoenix Park, Pyungchang, Korea



KOFST
THE KOREAN FEDERATION OF SCIENCE AND
TECHNOLOGY SOCIETIES

Photoluminescence Characteristics of Hybrid Nanoparticles of MEH-PPV and Au

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Hybrid nanoparticles (NPs) of poly (2-methoxy-5-(2'-ethyl-hexyloxy)-*p*-phenylene vinylene) (MEH-PPV) with dodecanthiolated Au nanoparticles were prepared in a simple reprecipitation method using a the distilled water. The diameters of MEH-PPV nanoparticles were in the range from 100 to 500 nm. The formation of hybrid MEH-PPV with dodecanthiolated Au NPs was confirmed by using a scanning electron microscopy (SEM) and a high-resolution transmission electron microscopy (HR-TEM). The nanoscale photoluminescence (PL) spectra and images were measured through a home-made laser confocal microscope (LCM) combined with atomic force microscope (AFM). The LCM PL characteristics of hybrid MEH-PPV/Au NPs were compared with those of MEH-PPV NPs. The LCM PL intensity of the single unit of the hybrid MEH-PPV/Au NPS was enhanced comparing with that of the MEH-PPV without Au NPs. We analyzed that the enhancement of the LCM PL intensity of the hybrid MEH-PPV/Au NPs might have originated from the energy transfer effect in surface plasmon resonance coupling due to the adhesion of Au NPs and/or from the local field enhancement between nano-gaps.