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ABSTRACTS

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- Organic Devices, Molecular Electronics
- Fabrication Technique and Characterization
- Liquid Crystals, Polymers, and Other Soft-Materials
- Biomolecular Electronics and Bioanalysis
- Nanocarbon and Nanotechnology

Organic-based Light-emitting Hybrid Nanoparticles

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Organic-based functional nanoparticles (NPs) of poly(2-methoxy-5-(2'-ethyl-hexyloxy)-*p*-phenylene vinylene) (MEH-PPV), tris(8-hydroxyquinolino)-aluminum (Alq₃) and poly(*N*-vinylcarbazole) (PVK) were prepared in a simple reprecipitation method, and used for a mother NP in a hybrid nanostructure. The dodecanthiolated Au NPs as daughter NPs were synthesized through a reduction of gold (III) derivatives. The diameters of the hybrid NPs were in the range from 100 to 500 nm. The formation of hybrid NPs was confirmed by using SEM, HR-TEM and FTIR experiments. Optical characteristics were investigated by using UV-vis absorbance and solution photoluminescence (PL) spectra. The nanoscale PL spectra and images were measured through a home-made laser confocal microscope (LCM) combined with 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. We also present the nanoscale optical properties of Alq₃ and PVK nanoparticles.