ME&D
International Conference on Molecular Electronics and Devices

The 21st International Conference on Molecular Electronics and Devices

(21st IC ME&D)

Program Book

May 19~20, 2010

70th Memorial Hall
Suncheon National University

Fabrication and Characteristics of PCBM Nanoparticles

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We report the fabrication of a phenyl-C61-butyric-acid-methyl ester, [60] (PCBM) nanoparticles (NPs) through reprecipitaion method,[1] and the nanoscale luminescence characteristics of PCBM single NP. The amorphous PCBM NPs were transformed to crystalline PCBM NPs through solvent-vapor annealing process. The formation, shape, and size of PCBM NPs were studied by scanning electron microscope (SEM), transmission electron microscope (TEM), and high-resolution TEM (HR-TEM) experiments. To discern the structural and optical properties of the amorphous and crystalline PCBM NPs, we measured ultraviolet and visible (UV/Vis) absorption and Fourier transform-infrared (FT-IR) spectra. The nanoscale luminescence characteristics of amorphous and crystalline PCBM NPs were characterized using a high-resolution laser confocal microscope (LCM) photoluminescence (PL) and color charge-coupled device (CCD) images.[2,3] We observed a considerable bright red light-emission for the crystalline PCBM NPs, compared to that of the pristine PCBM NPs, which were directly confirmed through the color CCD images and LCM-PL images and spectra. The enhanced luminescent properties of crystalline PCBM NPs might have originated from the better molecular alignment effect through the thermal treatment.

References

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발표분야(Scope and Theme): Nano Fabrication Characterization

발표형식(Presentation Form): 구두(Oral) [ ] 포스터(Poster) [O]

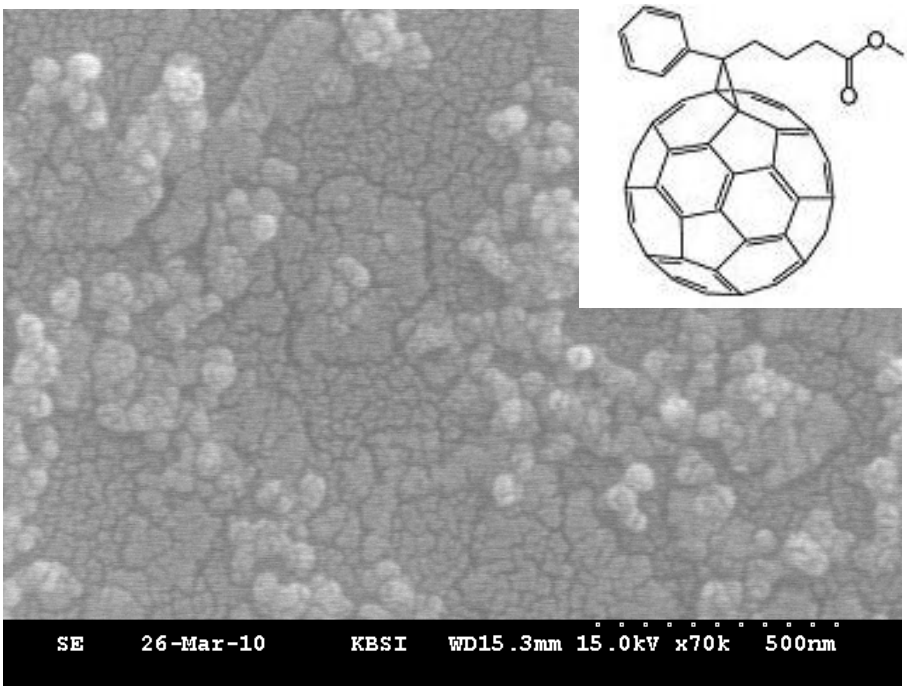

Figure SEM image of PCBM NPs. Inset: Chemical structure of PCBM molecule.