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ABSTRACT BOOK

Control Optical Properties of Rubrene Nanoparticles

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Organic rubrene nanoparticles (NPs) were fabricated using a reprecipitation method with distilled water. The optical properties of rubrene NPs could be controlled by using hydrothermal treatment at various temperatures from 110 °C to 180 °C. We observed that the solid sphere shape of pristine rubrene NPs was changed into nanoporous sphere shape through the hydrothermal treatment. The diameters of pristine rubrene NPs were 100 ~ 200 nm, and after the hydrothermal treatment, the diameters of the NPs varied to 100 nm ~ 2 μm. The structure and surface morphology of pristine and hydrothermal treated rubrene NPs were compared through SEM and HR-TEM images. The optical properties were investigated by PL spectra and laser confocal microscope (LCM). With increasing hydrothermal temperatures, the PL peaks of rubrene NPs were blue-shifted. The result can be analyzed in terms of the size variation of rubrene NPs through the hydrothermal process. We studied the characteristics of organic photovoltaic cells (OPVC) using hydrothermal treated rubrene NPs.