

Fifth International Conference on Molecular Electronics and Bioelectronics (M&BE5)

ABSTRACTS

March 15-18, 2009, at Miyazaki International Conference Hall
Phoenix Seagaia Resort, Miyazaki, Japan



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

Electrical and optical characteristics of light-emitting rubrene nanowires

Jin Woo Lee, Kihyun Kim, Jin Sun Jung, Seong Gi Jo, Sang Won Bae, and Jinsoo Joo*

*Department of Physics and Hybrid Nanostructure Research Lab, Korea University, Seoul,
136-713, Korea*

E-mail: shaum@korea.ac.kr, jjoo@korea.ac.kr

We report on the fabrication, electrical, and optical characteristics of light-emitting rubrene nanowires. Rubrene nanowires with diameters of 100 ~ 200 nm were directly grown by using organic vapor transport through Al₂O₃ nanoporous templates [1]. The formation of the rubrene nanowires was visualized through SEM and TEM experiments. In order to increase the crystallinity, the rubrene nanowires were treated by using hydrothermal annealing method. The optical properties including laser confocal microscope photoluminescence (PL) in nanoscale were investigated for the rubrene nanowires. The organic field-effect transistors (OFETs) were prepared by placing the rubrene nanowires onto SiO₂/Si substrates. Then, Au/Ti electrodes were deposited on the rubrene nanowires through E-beam lithography. The OFETs using the rubrene nanowire showed a typical p-type operating mode. The charge carrier mobility and electrical conductivity for the rubrene nanowires were measured. We also observed that PL intensity of rubrene nanowire varied for the E-beam irradiation.

[1] J. W. Lee, et al., Adv. Func. Mater. in press (2008).