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ABSTRACTS

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- Organic Devices, Molecular Electronics
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Electrical and optical characteristics of light-emitting rubrene nanowires

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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.