

Polarized Emission of Uniaxially Oriented Semiconductor Nanorods in Light-Emitting Application

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The transmittance through the display polarizer used for outdoor visibility is a limitation of a highly luminescent device. The uniaxial orientation of nanorods immediately induces not only enhancing the optical extraction efficiency of the device but reducing the light loss through the linear polarizer. Herein, we report the photoluminescent and electroluminescent polarization of semiconductor nanorods emissive film by flow-induced orientation. The PVK molecules promote the arrangement of nanorods and provide conductivity to suppress the leakage current of the emissive layer of the electroluminescent device. In the blend film, the side-by-side and end-to-end interaction between PVK and nanorods was observed by SEM. This end-to-end assembly of nanorods have a high degree of alignment in the film formation process. The EL polarization results in 70% transmittance of the linear polarizer, consequently contribute to overcoming the intrinsic optical extraction of an EL device.