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Fabrication of Beta-phase Poly(9,9-dioctylfluorene) Nanowire Arrays for Polymer Light-Emitting Diode Using Direct Printing Method

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We report a one-step fabrication method of Poly(9,9-dioctylfluorene) (PFO) nanowire array with pronounced β -Phase. We use liquid-bridge-mediated nanotransfer molding (LB-nTM) which is a new direct nano-patterning method based on the direct transfer of various materials from a mold to a substrate via liquid layer. The formation of the β -phase morphology in the resulting PFO nanowire array was evidenced by the presence of an absorption peak at 435nm. With the collection polarizer oriented parallel to the wire long axis, the PL emission was most intense and an emission dichroic ratio, DRE, of 3.7 was determined. The nanowire array have been investigated by scanning electron microscopy (SEM). Also, we simply fabricated structure of device of ITO/PFO nanowire arrays/Al and the electroluminescence spectra were recorded at various applied voltage.

Keywords: Poly(9,9-dioctylfluorene) nanowire soft lithography OLED