

Synthesis and Electro-optical Properties of poly(2,3-diphenyl-1,4-phenylene vinylene) Containing polyethylene oxide and laterally attached triphenylene side-groups

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Abstract

The goal of this research is to study the synthesis and application of new light-emitting polymers. The first part of this study is focused on the synthesis and electro-optical properties and of poly(2,3-diphenyl-1,4-phenylene vinylene) (DP-PPV) containing polyethylene oxide side chains. The formation meso-structure nanocomposites by sol-gel process with tetraethyl ortho-silicate(TEOS) was demonstrated .The second part is to study the synthesis of poly(2,3-diphenyl-1,4-phenylene vinylene)s (DP-PPVs) containing triphenylene liquid crystal side groups and their application in polarized emission.

In the first part, three kinds of DP-PPV derivatives containing polyethylene oxide side chains were synthesized. The monomers which contain polyethylene oxide were polymerized via Gilch-route to yield DP-PPV conjugated polymers. Among three polymers P1 showed a high EL brightness 677cd/m^2 . The formation meso-structure nanocomposites by sol-gel process with tetraethyl ortho-silicate was demonstrated .We fabricated two different nano structures by

changing solvent polarity and pH value. Two different nano structures such as micelle and hexagonal phase was obtained. In the second part, three kinds of DP-PPV containing triphenyl liquid crystal side groups were synthesized. The monomers which contain a triphenyl side group were polymerized via Gilch-route to yield DP-PPV conjugate polymers. The results indicate that the absorbance parallel to the rubbing direction is much higher than that perpendicular to the rubbing direction, which means that the mesogens are aligned parallel to the rubbing direction.

