

Optoelectronic Properties of Spin Self-assembled PPV/Layered Silicate Multilayer Thin Films

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We have prepared multilayer nanostructural thin films through a layer-by-layer spin self-assembly method using poly(p-phenylene vinylene) /montmorillonite. Sodium montmorillonite particles exfoliated into single sheets (or thin platelets composed of 2-3 sheets) and cationic PPV precursor and such anionic MMT plates were spin self-assembled by electrostatic attraction. Because MMT layers in SA film strongly adhere to PPV chains, they generate various energy trap states and cause the transformation of vibrational lines of electrons. Therefore, we could control the optoelectronic properties of the films and change the PL spectrum by controlling the structures of the SA thin films which can determine the movable tendency of the excitons according to the conditions of the accumulated layers. The spin self-assembled films showed great photostability and their photoluminescent(PL) spectra were somewhat different from that of bulk PPV films. Electroluminescence(EL) devices composed of alternating poly(p-phenylene vinylene) and exfoliated montmorillonite films showed higher electrical stability and luminescent efficiency.