Controlling of DOS of TFTs based 6,13-bis(triisopropylsilylethynyl) pentacene by solar light illumination

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Abstract

The effect of dipole layer and white light illumination on the density of states for the 6,13-bis (triisopropylsilylethynyl)pentacene (TIPS-pentacene) thin film transistor were investigated. We developed a physical compact model based on variable range hopping (VRH) theory for expressing the DOS in OTFTs that takes into account the effects of dipole layer and white light illumination. Using this model, we explain that the DOS for TIPS-pentacene thin film transistor depend strongly on the white light illumination under the surface dipole effect. Finally, an analytical model of drain-current has been developed in order to reproduce the output and transfer characteristics curves of 6,13-bis (triisopropylsilylethynyl)pentacene (TIPS-pentacene) phototransistor in saturation regime. (C) 2016 Elsevier B.V. All rights reserved.

Keywords

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