

Photo-Switching effect on 6,13-Bis(triisopropylsilylethynyl)Pentacene/TiO₂ Nano-composite Thin-Film Transistors

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Solution-processed Organic Thin-Film Transistors (OTFTs) are of increasing interest because of its significant potential such as possibility of low-cost, flexibility and large-scale process. They also remarkable for their optoelectric characteristics, in other words, photosensitivity.

We have investigated an organic phototransistors using 6,13-Bis(triisopropylsilylethynyl)Pentacene(TIPS-Pentacene) and Titanium Dioxide (TiO₂) nanocomposite materials for active layer. For this study, TiO₂ nanoparticles composited with TIPS-Pentacene measured the electrical characteristics under illumination on off-state gate bias. This is able to explain with absorbance peak of particular wavelength. Also, We have obtained photocurrent continues a fairly long time which illumination is off. This means their probability of photo-switching devices and optical memories. For more detailed, various electrical and optical characteristics will be discussed.

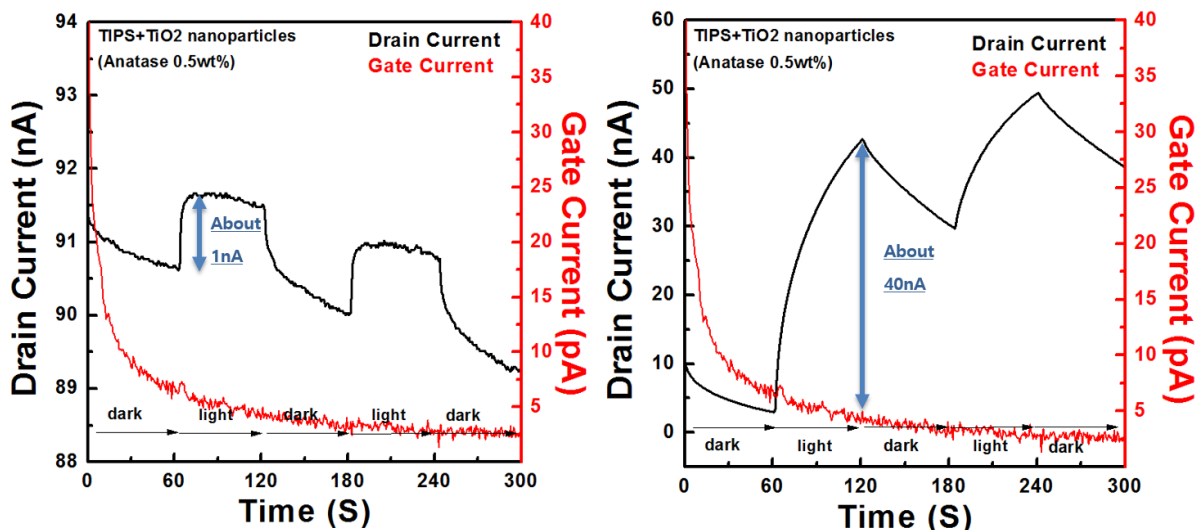


Fig. 1. Photo-Switching effect test on OTFTs using TiO₂ nanoparticles in TIPS-Pentacene active layers. The electrical characteristic measured at $V_G = -30$ V; On-state (Left), and $V_G = +30$ V; Off-state (Right) respectively under the drain bias of $V_D = -20$ V.

Acknowledgment

This work was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF-2012R1A1A2043958)

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