

HOLES' MOBILITY PROPERTIES OF PCPDTBT THIN FILM HYBRID TRANSISTORS

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In the organic semiconductors devices morphology, temperature and charge carriers movement are tightly linked together. The change in the temperature of the active layer can affect charge carriers transport but it can also significantly change the morphology of the organic layer. In this work we investigated holes' mobility in the hybrid field effect transistor structures with an active layer of PCPDTBT on SiO₂/Si substrates. Holes' mobility and its dependence on the temperature was measured by i-CELIV [1] and current transient [2] methods. The combination of both techniques allowed us to investigate properties of holes transport in different directions in the layer (perpendicular and parallel to the SiO₂/Si substrate). Differential scanning calorimetry (DSC) measurements in the same temperature range were performed to investigate and explain morphological changes in the active layer of the field effect transistor structure.

[1] G. Juška, N. Nekrašas, K. Genevičius, Investigation of charge carriers transport from extraction current transients of injected charge carriers, *Journal of Non-Crystalline Solids* 358 (2012) 748–750, <https://doi.org/10.1016/j.jnoncrysol.2011.12.016>.

[2] G. Juška, N. Nekrašas, K. Genevičius and A. Pivrikas, Current transients in organic field effect transistors, *APPLIED PHYSICS LETTERS* 102, (2013) 163306, <https://dx.doi.org/10.1063/1.4803054>.