

Diploma thesis abstract.

Lifetime distribution of polarons in films of semiconducting polymer and electron acceptor.

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One of the disadvantages of conjugated polymer as a semiconducting material is low mobility of charges. It's value in average approximately 3 times low than that for inorganic semiconductors. Presence of charge traps resulting in deformation of polymer chains or impurities could be the main reason of low charge mobility. In this study we attempt to characterize the charge traps in polymers. Depth of charge traps is determined by the characteristic time-to-charge of the trap.

In this work we study relaxation dynamic of polarons (electrons or holes) in films of semiconducting polymer and electron acceptor using photoinduced absorption spectroscopy. The MEH-PPV (poly[2-méthoxy-5-(2-éthyl-hexyloxy)-1,4-phénylène-vinylène]) as a semiconducting polymer and PCBM as an electron acceptor was used.

The model of polaron's relaxation, based on assumption that the charge traps is the main reason of millisecond polaron's lifetimes, was proposed. Using this model we calculated the depth of charge traps in MEH-PPV.

It has been observed that MEH-PPV degrades during measurement. The dynamic of degradation was measured using photoinduced absorption spectroscopy. The depth of charge traps, producing in photooxidation of MEH-PPV, was calculated.