Title: Properties of solar cells based on polymer-silicon junction

Author: Dean Pavlovič

Department / Institute: Department of Macromolecular Physics

Supervisor of the bachelor thesis: doc. RNDr. Jiří Toušek, CSc, Department of Macromolecular physics

Abstract:

The aim of this work is to study unconventional materials, namely conjugated polymers, as to be used for photovoltaic purposes. Among these polymers are polyaniline, derivative of polyphenylene vinylene and two derivatives of polythiophene. Four different methods are used to study some of the physical quantities of the samples, that should affect overall efficiency of solar power conversion. Firstly, I-V characteristics yields fill factor and indicates mechanism of charge transport. Method based on surface photovoltage (SPV) estimates diffusion length of the charge carriers - excitons. Impedance spectroscopy and particular method abbreviated CELIV both measure charge carrier mobility. Outcome of this work are the values of these quantities for some of the samples.

Keywords: organic semiconductors, solar cells, mobility, diffusion length, current-voltage characteristic