Fall 12

Colloquium Cukrovarnická

Ve středu dne 24. října 2012 v 10:00 hod.
ve Fyzikálním ústavu Cukrovarnická v seminární místnosti (budova A, 1. patro)

The universal energy level alignment of organic molecules on metal oxides

Lothar Ley

University of Erlangen, Germany

La Trobe University, Melbourne, Australia

A model is developed that describes the universal energy level alignment at the interface of organic molecules and metal oxides as it is encountered in organic photovoltaics and organic light emitting diodes, for example. The model reproduces the experimental observation that frontier orbitals (HOMO, LUMO) of organic molecules are under certain conditions pinned close to but not at the Fermi energy but rather about 0.3 eV away from EF. It further explains why the level alignment is insensitive to details such as the electronic structure of the oxide, defects in the oxide, and the thickness of oxide and overlayer. The results have implications for the so called interface polarons as postulated by Salaneck et al. and it might even give a simple and straightforward explanation for the 0.5 eV difference between open circuit voltage and charge transfer energy in organic PV cells.

J.J. Mareš, ved. sekce 3