



seminar

Friday April 16th

Facultad de Ciencias
Aula 402, 4^a floor, Módulo 13
Universidad Autónoma de Madrid

11:30h Photoinduced energy and charge transfer in conjugated polymers

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The energy of an optical excitation is a key parameter in the understanding of the opto-electronic properties in organic semiconductors. The energetics of the dissociation of an excited state (single or a triplet) into a pair of free charges and vice versa, the recombination of an electron-hole pair yielding an excited state is depending on the energy of this optical excitation. Hereby I will present the investigation of two types of materials used with these two purposes. In the first material, a so called host-guest system used for light generation, we explore the energy transfer from a guest molecule to another. In the second type of materials, a polymer/PCBM bulk heterojunction, we explore photoinduced charge transfer processes. The latter system is used to generate electricity via photon absorption in photovoltaic devices. The spectroscopic tools used are photoluminescence, photoinduced absorption and Electron Paramagnetic Resonance (EPR) spectroscopy. They allow the study of photoinduced charge and/or energy transfer processes between compounds.

In the host-guest systems the guest materials, quinquetiophene (T5) and terthiophene (T3) oligomers, are inserted in the nanochannels of a PHTP host and act as a donor-acceptor moiety. The investigation of these light harvesting compounds aims to characterize triplet states and to study the energy transfer from the donor (T3) to the acceptor (T5). The bulk heterojunction of (poly[2,6-(4,4-bis-(2-ethylhexyl)-4H-cyclopenta[2,1-b;3,4-b?]-dithiophene)-alt-4,7-(2,1,3-benzothiadiazole)]- in short PCPDTBT) and PCBM is also studied by optical spectroscopy and EPR. We perform a study of the different photogenerated excited states. An in-depth understanding of the photophysical processes in the active layer of a device will aid a more efficient device design.

[Nanociencia y Nanotecnología: lo pequeño es diferente
Nanoscience and Nanotechnology: small is different]

