contribution, we would like to investigate such phenomena and built up a dissociation model for CO_2 which takes into account CO_2 vibrational excited states and the strong coupling of the vibrational kinetics with the electron energy distribution function (eedf).

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#P148 - Enhanced Efficiency of Organic Solar Cells by thiol-capped Au-Nanoparticles

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Organic solar cells (OSCs) are attracting significant interest because of their relevant features such as low cost, ease of manufacture, mechanical flexibility and lightness along with portability. Devices based on poly(3-hexylthiophene) (P3HT) as donor and soluble fullerene derivatives (PCBM)as acceptor are among the most studied, providingpromising power conversion efficiency (PCE). However, low carrier mobility in heterojunction networks remain the major obstacle for improving device efficiency. Because of poor charge transport in the active layer there is competition between the separation and recombination of the photogenerated carriers. Thus, there is a need to develop strategies for increasing light harvesting by the same film thickness. Also, metallic nanoparticles (NPs) are very interesting systems due to their optical and electrical properties. In particular, metal NPs such as Au, Ag, Cu and Pt are known to show plasmon-enhanced absorption which could ensure a greater absorption and an enhanced photogeneration of mobile carriers in the heterojunction films. [1]
In this work, we present a study on the effect of thiol-capped AuNPs of various sizesin an organic solar cell.AuNPs have been obtained by laser ablation in liquid solution[2], have been functionalized both with 2-naphthalenethiol and alkanethiol having different length. In addition to bulk heterojunction structures with optimized interpenetrating network of donors and acceptor domains, we have chosen to study planar heterojunctions (PHJs), consisting of three component thin films realized by sequential deposition of P3HT, AuNPs and PCBM from orthogonal solvents.
These structures have been studied by different microscopy and spectroscopy surface tools. Results show that2-naphthalenethiol-capped AuNPs incorporated at the P3HT/PCBM interface in planar heterojunctions ensures a more efficient charge transfer with respect to heterojunction without AuNPs. Additionally, I/V curves showed that the incorporation of AuNPs with an approximate size of 30 nm can significantly enhance the PCE from 0.7 % to 2.7. Results are discussed in terms of the dependence of fill factor, electron transfer and short circuit current on the morphological order, plasmonic and scattering properties of AuNPs in the thin films.

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#P149 - COMPARISON OF ACTIVITY IN THE 2-PROPANOL DEHYDRATION OF SUPPORTED HETEROPOLY ACID (PHOTO) CATALYSTS AT THE GAS-SOLID INTERFACE

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2-Propanol dehydration at the gas-solid interface over supported Brønsted acid catalysts based on $H_3PW_{12}O_{40}$ (PW_{12}) Keggin-type heteropoly acid was studied. A continuous flow fixed-bed reactor working at atmospheric pressure and 80 °C and isopropanol initial concentration 0.5 mM was used. Preliminary experiments were performed to find out the flow rate of the feeding gas necessary to avoid mass transport limitation phenomena and hence carry out the experiments in kinetic regime; consequently, a flow rate of 100 ml min^{-1} was used in all the experiments. For the photo-assisted runs the reactor was also illuminated from the top with UV LEDs at different irradiances.The (photo)catalysts included bare and supported PW_{12}. Binary materials have been prepared by impregnation and/or solvothermal treatment by using commercial supports: SiO_2 (Mallinckrodt), TiO_2 (Evonik P25) and carbon nanotubes (Sunnano) or solvothermalhome prepared SiO_2, TiO_2 or ZrO_2. All the materials have been characterized by X-ray diffraction (XRD), scanning electron microscopy observations (SEM) with EDX microanalysis, specific surface area measurements and diffuse reflectance spectroscopy (DRS). The retention of Keggin anion structure throughout the synthesis of catalysts was confirmed both by FTIR and Raman spectroscopies. When the materials were also illuminated the conversion of 2-propanol and consequently the propene formation increased. Propene was the main reaction product, but also the formation of small amounts of di-isopropyletherwas observed; however, the various supported materials showed significant differences. The comparison of the