Laboratoire PPSM – UMR CNRS 8531

Photochimie et Photophysique Supramoléculaires et Macromoléculaires

Séminaire PPSM

Mercredi 9 Juillet 2014 - 10h45

Salle de conférence du Pavillon des Jardins

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Invité par : Pierre Audebert

«Donor-Acceptor Conjugated Molecules, Oligomers and Polymers in Electrochromic and Photovoltaic Systems»

Conjugated molecules, oligomers and polymers with intimately interacting donor-acceptor moieties provide light harvesting and electronic energy levels that can be tuned to optimize their utility in electrochromic, along with both bulk heterojunction and dye sensitized solar cell applications. In this presentation, we will explore the combination and interaction of a breadth of electron rich and electron poor species that ultimately allow us to prepare polymer films with band gaps that range from 4 eV in the UV to near 0.5 eV in the infrared. The flexible synthetic chemistry of dioxythiophene-based polymers has allowed us to complete the color palette (yellow, orange, red, purple/magenta/, blue, cyan, green, and black) of vibrantly colored to highly transmissive switching, spray processed electrochromes of any color, with donor-acceptor interactions especially enabling materials that are black, green and cyan in color. Donor-Acceptor-Donor (DAD) triads with internally fused DA cores provide a means of examining the directionality of conjugation in charge injection to metal oxide electrodes. Isoindigo-based polymers synthesized using a selection of electron accepting co-monomers, provides n-type doping characteristics and donor polymers which, in conjunction with PCBM, yield solar cells with power conversion efficiencies approaching 7%, with high morphological reproducibility.

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