CYCLE DE CONFÉRENCES DE CHIMIE

Avec le concours de : Manufacture Française des Pneumatiques MICHELIN
Ecole Nationale Supérieure de Chimie de Clermont-Ferrand
Institut de Chimie de Clermont-Ferrand (ICCF UMR 6296)
U.F.R.S.T. Département de Chimie

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Amphi de Chimie Paul REMI - (Site des Cézeaux)

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Controlling the electronic properties in organic supramolecular materials using light

The rational design of supramolecular structures endowed with tunable electronic properties is a cornerstone towards bridging the bottom-up and top-down approach to molecule-based electronics.[1] For applications in solar energy conversion, the organization of the electron donating and electron accepting moieties is a prerequisite which can be attained by making use of designed supramolecular interactions. A major feature of the self-assembly process is that individual components will spontaneously combine in a predetermined fashion due to the presence of complementary molecular recognition sites. Hydrophobic / hydrophilic interactions, metal ion coordination, π-stacking interactions, and hydrogen bonding have all been used successfully in the preparation of multi-component molecular edifices. This can lead to interesting photochemical and photophysical behavior, such as the observation of additional electronic interactions, or the control of excited-state processes. With this in mind, we investigate the use of molecular recognition motifs to direct the formation of selected architectures possessing unique ground- and excited-state electronic properties. This has recently led to the spontaneous generation of highly emissive organic nano-spheres whose color can be continuously tuned from blue to red,[2] the formation of fullerene double cables exhibiting the capability of undergoing a photoinduced switch in the polarization emission.[3,4]

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[2] K.P. Tseng, F.C. Fang, J.J. Shyue, K.T. Wong, G. Raffy, A. Del Guerzo, D.M. Bassani *Angew. Chem. Int. Ed.* **2011**, 50, 7032.

[3] C.-C. Chu, G. Raffy, D. Ray, A. D. Guerzo, B. Kauffmann, G. Wantz, L. Hirsch, D. M. Bassani, *J. Am. Chem. Soc.* **2010**, *132*, 12717

[4] G. Raffy, D. Ray, C.C. Chu, A. Del Guerzo, D. M. Bassani *Angew. Chem. Int. Ed.* **2011**, *50*, 9584.

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