

Séminaire de Chimie Autour des Nanosciences

RÉMI MÉTIVIER

Chercheur CNRS, Laboratoire PPSM (UMR8531), ENS Paris-Saclay

LIGHT-CONTROLLED ENERGY TRANSFER PROCESSES IN PHOTOCHROMIC-FLUORESCENT NANOMATERIALS

The design of photoswitchable multifunctional molecules, materials and devices is an appealing field of research with a growing number of recent potential applications. In this regard, diarylethenes (DAE) are of particular interest since these photochromic molecules are excellent candidates for a wide variety of optical applications such as photomechanical conversion, photocontrol of DNA structure and living organisms but also optical data storage and super-resolution imaging. For these two latter areas, appending fluorescence properties to the DAE compounds would be highly beneficial thanks to the combination of the photoswitchable behavior of the photochromic reactions and the high sensitivity of fluorescence spectroscopy. In this lecture, three main categories of molecular systems based on DAE derivatives with fluorescent properties will be presented: (i) the DAE unit itself shows fluorescence properties, (ii) the DAE and the fluorescent units are associated non-covalently, and (iii) the DAE and the fluorophore are linked via covalent bonds. Structural characterizations, steady-state and time-resolved spectroscopy investigations, from the ensemble level down to the single nanoparticle level, will be developed to quantify the switching efficiency, demonstrate nonlinear photoswitchable fluorescent properties, and decipher the processes driven at the nanoscale (intra- and intermolecular energy transfer) leading to amplification effects when a large number of chromophoric species are involved.

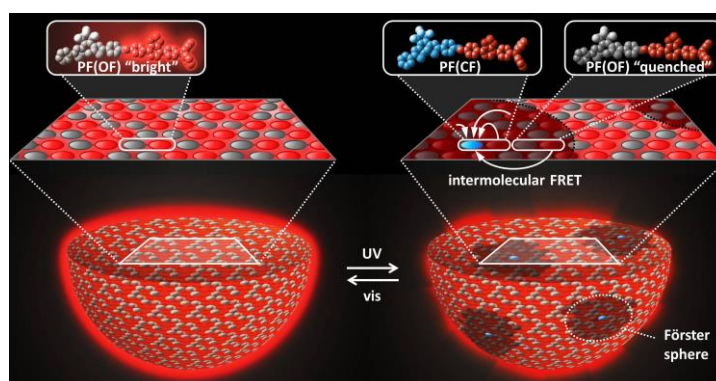


Figure 1. Illustration of amplified fluorescence photoswitching in nanoparticles based on multiple intra- and intermolecular energy transfer processes.

LE VENDREDI 24 février À 11H00
Bat. Lavoisier, salle 774, 15 rue Jean de Baïf 75013 Paris

Contacts : Giorgio Mattana et François Mavré,
Tél : +33 (0)1 57 27 88 42/87 82