



Laboratoire PPSM – UMR CNRS 8531

Photochimie et Photophysique Supramoléculaires et Macromoléculaires

Séminaire du PPSM

Jeudi 04 novembre 2010 - 14h

Auditorium D. Chemla - Bâtiment IDA

Professeur Jiro Abe

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Invité par : Keitaro Nakatani

«Fast Photochromism of [2.2]paracyclophane-bridged imidazole dimer»

We demonstrate that photochromism based on light-driven reversible bond cleavage can enable rapid coloration upon UV light irradiation and successive fast thermal bleaching within tens of microseconds at room temperature. Recently we reported two novel fast photochromic molecules, 1-NDPI-8-TPI-naphthalene¹ and pseudogem-bisDPI[2.2]PC², which show instantaneous coloration upon exposure to UV light and rapid fading in the dark. The half-life of colored species at 25 °C of 1-NDPI-8-TPI-naphthalene and pseudogem-bisDPI[2.2]PC in benzene are 170 and 33 ms, respectively. In view of the thermal-bleaching rate, the fast photochromism of pseudogem-bisDPI[2.2]PC is applicable to real-time image processing at video-frame rates. Thus, molecular design based on the photochromism of hexaarylbiimidazole (HABI) can lead to the development of a new family of photochromic compounds with unprecedented switching speeds and remarkable stability, which could eventually evolve into solid-state photonic materials with unique photoresponsive characters.

References

1) Fujita, K.; Hatano, S.; Kato, D.; Abe, J. Photochromism of a Radical Diffusion-Inhibited Hexaarylbiimidazole Derivative with Intense Coloration and Fast Decoloration Performance. *Org. Lett.* **2008**, *10*, 3105-3108.

(2) Kishimoto, Y.; Abe, J. A Fast Photochromic Molecule That Colors Only under UV Light. *J. Am. Chem. Soc.* **2009**, *131*, 4227-4229.

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