

Offre de thèse en 2018

Supramolecular assemblies based on [60]fullerene derivatives

Equipe SOMaF, Laboratoire MOLTECH-Anjou, UMR CNRS 6200, Université d'Angers

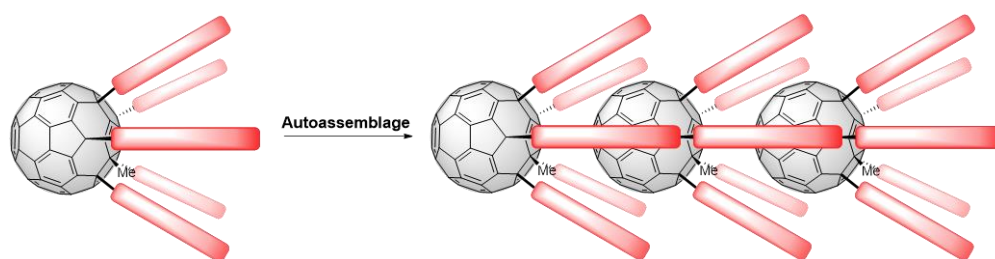
Direction : Stéphanie LEGOUPY, stephanie.legoupy@univ-angers.fr, 02 41 73 53 75

Co-direction : Piétrick Hudhomme

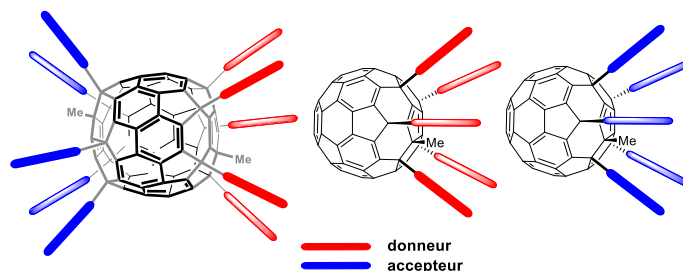
Financement : Allocation doctorale

Sujet de Thèse :

Since 20 years, fullerene-based supramolecular assemblies have been investigated. Notably, interesting materials such as fullerene-containing supramolecular polymers have emerged. In this context, chemical modifications of fullerenes have resulted in different supramolecular organizations depending on the nature of their assemblies (hydrogen bond, hydrophobic, metal-ligand, aromatic π - π stacking...). Most research on supramolecular polymers based on fullerene derivatives as monomers has been focused on mono-adducts. However, polyadducts having an intrinsic multivalent effect have been studied in a less extent. Recently, we reported the synthesis of a new generation of donor-acceptor supramolecular polymer based on penta(organo)[60]fullerenes bearing five electroactive fragments, namely tetrathiafulvalene (TTF), acting as recognizing units.



Mission: The work of the PhD student will focus on the synthesis of new [60]fullerene derivatives functionalized by electro or photoactive groups, their characterization and the study of their supramolecular properties in solution and in the solid state (NMR, electrochemistry, UV, AFM, TEM, DLS ...).



Collaboration: Collaboration with Christophe Chassenieux and Lazhar Benyahia of the Institute of Molecules and Materials of Le Mans.

Required profile: The candidate must hold a master 2 or an engineering degree in organic chemistry. He or she must have a particular interest in experimental work, multidisciplinary subjects and teamwork. A good knowledge of the characterization of materials would be an advantage.

Candidature : <https://theses.u-bretagneoire.fr/3m/>

1. (a) Perez, E. M.; Martin, N. *Chem. Soc. Rev.*, 2008, 37, 1512. (b) Perez, E. M.; Sanchez, L.; Fernandez, G.; Martin, N. *J. Am. Chem. Soc.* **2006**, 128, 7172. (c) Perez, E. M.; Capodilupo, A. L.; Fernandez, G.; Sanchez, L.; Viruela, P. M.; Viruela, R.; Orti, E.; Bietti M.; Martin, N. *Chem. Commun.* **2008**, 4567.
2. (a) Fernández, G.; Pérez, E. M.; Sánchez, L.; Martín, N. *Angew. Chem. Int. Ed.* **2008**, 47, 1094. (b) Ho, K.-H. L.; Hijazi, I.; Rivier, L.; Gautier, C.; Joussetme, B.; de Miguel, G.; Romero-Nieto, C.; Guldi, D. M.; Heinrich, B.; Donnio, B.; Campidelli, S. *Chem. Eur. J.* **2013**, 19, 11374. (c) Isla, H.; Pérez, E. M.; Martín, N. *Angew. Chem. Int. Ed.* **2014**, 53, 5629. (d) Ho, K. H. L.; Joussetme, B.; Campidelli, S. *J. Porphyr. Phthalocyanines* **2016**, 20, 1142
3. Busseau, A.; Villegas, C.; Dabos-Seignon, S.; Cabanetos, C.; Hudhomme, P.; Legoupy, S. *Chem. Eur. J.* **2016**, 22, 8452