UFR de Chimie

Master Molécules, Matériaux, Surfaces

université PARIS DIDEROT PARIS 7

Séminaire de Chimie Autour des Nanosciences

STÉPHANE CAMPIDELLI

CEA Saclay, IRAMIS, Laboratoire d'Innovation en Chimie des Surfaces et Nanoscience, F-91191 Gif sur Yvette.

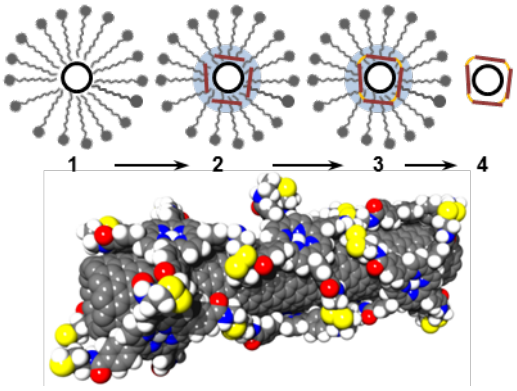
Donnera une conférence sur le thème :

FUNCTIONALIZATION OF CARBON NANOTUBES AND GRAPHENE FOR OPTICS AND ELECTROCATALYSIS

The fabrication of tailor-made functional hybrid materials that preserves and combines the properties of their building blocks is a central issue of nanosciences. In particular, the development of efficient techniques for the functionalization of carbon-based nanomaterials (carbon nanotubes and graphene) preserving their exceptional quality, while robustly enriching their functionalities (in particular their optical properties) is highly desirable for demanding applications.

It is well established that the covalent grafting of molecules on carbon nanotubes and graphene gives rise to robust conjugates since the addends are linked through covalent bonds. However, the transformation of carbon atoms hybridized sp^2 into sp^3 in the conjugated carbon framework induces a sizeable loss of their electronic properties. On the contrary, the non-covalent functionalization permits to better preserve the electronic properties of the nano-objects. So, for a number of applications, the non-covalent functionalization should be preferred. Nevertheless, this approach suffers from a major drawback which is the lack of stability of the resulting assemblies.

I will describe the general approach that we developed in our group for functionalizing nanotubes and graphene. This method is based on the templated-polymerization of organic molecules around nanotubes or graphene; it combines most advantages of both covalent and non-covalent methods without their principal drawbacks. This approach permits to obtain hybrid materials exhibiting high stability while preserving the integrity of the π-conjugated system responsible for their optical and electrical properties.



LE VENDREDI 19 Février À 11H00

Bat. Lavoisier, salle 774, 15 rue Jean de Baïf 75013 Paris

Contacts : Claire Fave et Vincent Noël,
Tél : +33 (0)1 57 27 72 26/72 08