

Invitation à la soutenance publique de thèse

Pour l'obtention du grade de Docteur en Sciences

Madame Florence PENNETREAU

Master en sciences chimiques

Xanthates as a tool for carbon nanotube and graphene functionalization. Application in supported catalysis.

Lately, carbon nanotubes and graphene have emerged as promising nanocarbon materials in various applications such as composite materials, medicine, electronics and catalysis. However in order to benefit from their entire potential, a functionalization step is usually required. In this context, the aim of this PhD thesis was the use of xanthate compounds to functionalize nanocarbonaceous materials in order to use them as support in homogeneous supported catalysis.

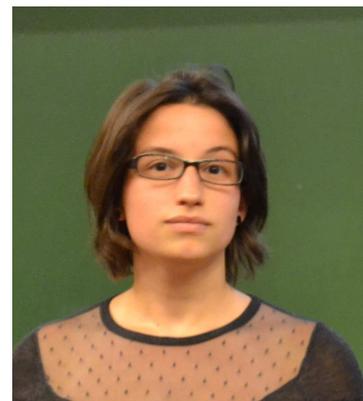
The first part of this work was devoted to the study of the xanthate reactivity towards various types of nanocarbons: carbon nanotubes, reduced graphene oxide and magnetic carbon nanotubes. Results showed that a reaction between xanthate fragments and the sp^2 -skeleton of nanocarbons, when initiated by thermally decomposed peroxides, actually took place. In addition, the combination of measurements performed using different characterization techniques revealed that fragments arising from the radical initiator were grafted at the nanocarbon surface along with xanthate fragments. The developed methodology was therefore redefined as a one-step double functionalization reaction.

The second main part of this PhD thesis was dedicated to the study of post-functionalization reactions, performed using anchored xanthate fragments as reactant. Various post-functionalization reactions such as amidation reaction, double Zard addition and anchoring of gold and platinum nanoparticles have successfully been performed at the functionalized nanocarbon surface, showing that the heterogeneization of these functions does not change their chemical nature or reactivity. As a consequence, we took benefit from the possible post-functionalization reactions to anchor different ligands at carbon nanotube surface.

The last part of this PhD thesis was dedicated to the preparation of nanocarbon-supported catalysts and their use in the Suzuki-Miyaura cross-coupling reaction.

Mardi 12 avril 2016 à 16h30

Auditoire BARB 92
Place Sainte Barbe, 1
1348 Louvain-la-Neuve



Membres du jury :

Prof. Sophie Hermans (UCL), promoteur
Prof. Olivier Riant (UCL), promoteur
Prof. Eric Gaigneaux (UCL), président
Prof. Alexandru Vlad (UCL), secrétaire
Dr. Hélène Olivier-Bourbigou (IFP Energies nouvelles, France)
Prof. Samir Zard (Ecole Polytechnique Palaiseau, France)
Prof. Christine Jérôme (ULg)