Self-Assembly of Organic Molecules on Reactive Metal Substrates

Yongfeng TONG

(Ligne TEMPO, Synchrotron SOLEIL, Gif sur Yvette et ISMO, Orsay, France)

THÈSE

Vendredi 8 décembre 2017 – 14h00
Amphi Bat. Accueil - Synchrotron SOLEIL

In this thesis, I report on the formation of self-assembled monolayers of different chalcogenide and planer π-conjugated molecules. Their electronic and structural properties were systematically studied mainly by synchrotron based X-ray photoelectron spectroscopy, scanning tunneling microscopy and low energy electron diffraction. A layer-by-layer assembly of dithiol on ZnO(0001) with intermediate metal deposition was performed and the formation of hybrid organic-inorganic self-assembled structure was obtained.

High-resolution XPS and near edge absorption fine structure spectroscopy study allowed to investigate the characteristics of self-assembled monolayers of benzeneselenol and selenophene on Cu (100), as well as dihexyldiselenide on Ni(111) and Pd(111). We have observed the existence of Se-C bond breaking processes and the presence of different adsorption sites of the molecules. On the other hand, we revealed the formation of a 5,5- bis(mercaptomethyl)-2,20- bipyridine (BPD) self-assembled monolayer with SH termination on ZnO(0001), which we have taken as a template for the grafting of Ag and Ni and then the assembling of BPD on this metal-dithiol layer.

In the last part of this thesis, we investigated the properties of self-organized large π-conjugated molecule NTCDA on metal surfaces. The NTCDA monolayer deposited by thermal evaporation shows highly packed structures with different domains and a lying-down orientation was regularly observed. With increasing the coverage, significant structural modifications were obtained and studied by XPS and NEXAFS.

Les membres du jury sont :

Dr. Hafsa. Korri-Youssoufi, Université Paris-Sud
Pr. Maurizio. Canepa, Université de Genova (Italie)
Pr. Yannick Fagot-Revurat, Université de Lorraine
Pr. Abdelkader Kara, Université de Floride (USA)
Dr. Vladimir Esaulov, Université Paris-Sud
Dr. Azzedine Bendounan, Synchrotron SOLEIL

Vous êtes cordialement invités au pot qui suivra

Formalités d'entrée : accès libre dans l'amphi du pavillon d'Accueil.
Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central merci de vous munir d'une piece d'identité (à échanger à l'accueil contre un badge d'accès)

SYNCHROTRON SOLEIL
L'Orme des merisiers - Saint-Aubin - BP48 - 91192 GIF S/YVETTE cedex
www.synchrotron-soleil.fr/fr/evenements
CONTACT : sandrine.vasseur@synchrotron-soleil.fr