CSACS Bulletin du CRMAA

Novembre 09 November

Centre de recherche sur les matériaux auto-assemblés
Centre for self-assembled chemical structures

Volume 12

Table des matières:

1) Le cours 534/634 course

Le département de chimie de l'U. McGill et le Centre québécois de recherche sur les matériaux auto-assemblés présentent le cours
Nanosciences et nanomatériaux (CHEM534)/Séminaires sur les matériaux avancés (CHEM634)
Session : Hiver 2010 (3 unités)
Horaire et local : vendredi 9 h – 11 h 30, Pulp and Paper, salle 113
Description : Une série de lectures portant sur des sujets contemporains au niveau des matériaux de pointe. Ce cours a pour but d'exposer l'étudiant aux perspectives rationnelles chimiques de la synthèse, caractérisation et compréhension des matériaux avancés et tout spécialement ceux à l'échelle nanométrique. Les sujets abordés seront les suivants:
Les sujets abordés seront les suivants:
Phénomène d'auto-assemblage, comme un concept de matériaux de pointe, les points quantiques et leurs propriétés spectroscopiques, matériaux polymériques nanostructures, lithographie douce et plusieurs d'autres.

Évaluation : Une série de courts essais et un travail de session (pour les étudiants du 1er cycle) ou un devis de recherche (pour les étudiants du 2ème cycle).

Pour voir le plan du cours au complet, s'il vous plaît visitez notre site Web.

Department of Chemistry, McGill U. and Quebec Centre for Self-Assembled Chemical Structures present a joint course
Nanoscience and Nanomaterials (CHEM534) Seminars in Advanced Materials (CHEM 634)
Term: Winter 2010 (3 credits)
Time and place: 9:00 – 11:30 Friday, Pulp and Paper room 113
Description: A series of lectures on topics of current interest in advanced materials. The focus of the course is on exposing the students rational chemical prospective to synthesis, characterization and understanding of advanced materials, particularly at the nano-scale.
The topics discussed will include:
Self-assembly phenomenon as an advanced materials concept, quantum dots and their special spectroscopic properties, nanostructured polymeric materials, surface characterization using scanning probe techniques, soft lithography, etc...

Evaluation: A series of short assignments and one final paper (for undergraduate students) or a research proposal (for graduate students)

To see the complete course outline please visit our website.

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Olof Ramström

2) Séminaires 09/10 seminars: Olof Ramström

Olof RAMSTRÖM
KTH - Institue Royale de Technologie/Royal Institute of Technology
Département de chimie/Department of chemistry

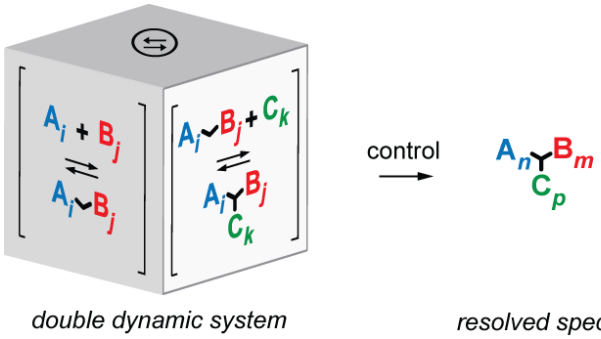
Chercheur senior au Conseil de Recherche de la Suède/Senior researcher of the Swedish Research Council

Titre/Title: Supramolecular Control in Synthesis and Discovery Processes

Date	Université
Nov.3	McGill
Nov.4	Montréal
Nov.5	Sherbrooke
Nov.6	Concordia

Résumé / Abstract

Control is a key feature in synthetic chemistry, and selectivity at different levels of influence is of highest importance when designing new reaction routes. Of special interest in this context is reaction control exerted through selective interactions between the reactants/reagents, an effect that may be regarded as supramolecular control. In addition, at a higher level of complexity, this type of control can be used to resolve dynamic systems in various discovery processes. Such dynamic systems can in turn be generated from both molecular and supramolecular interactions, resulting in systems of continuously interchanging constituents. In this presentation, aspects of supramolecular control and control of dynamic systems will be discussed, and examples in substrate identification and asymmetric synthesis given.



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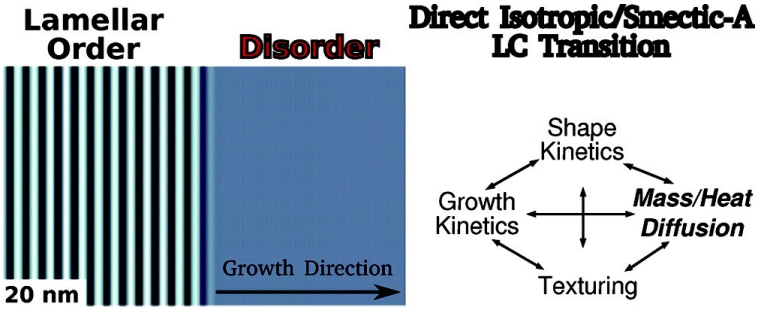
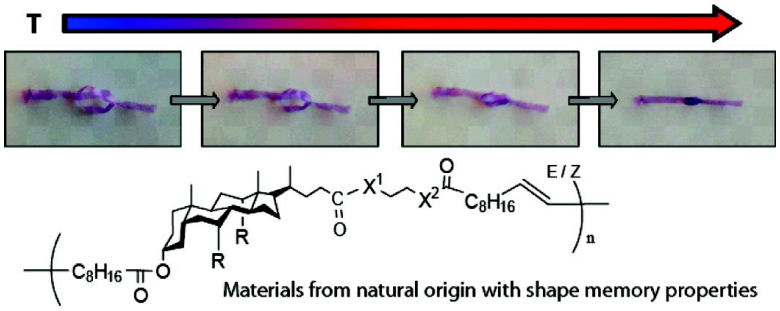
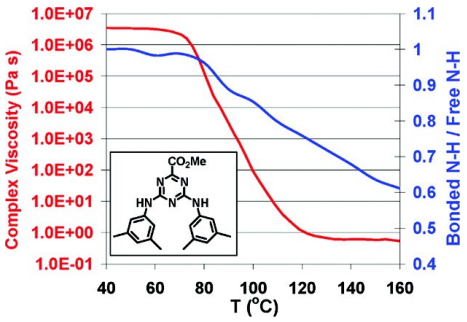
3) Publications



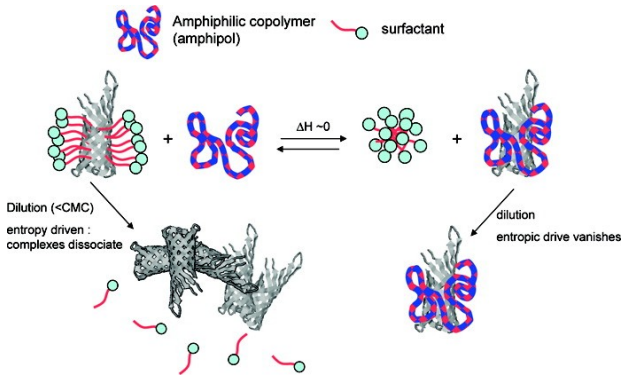
Nasser Mohieddin Abukhdeir and Alejandro D. **Rey**, Nonisothermal Model for the Direct Isotropic/Smectic-A Liquid-Crystalline Transition. *Langmuir*, 2009, 25 (19), pp 11923–11929.



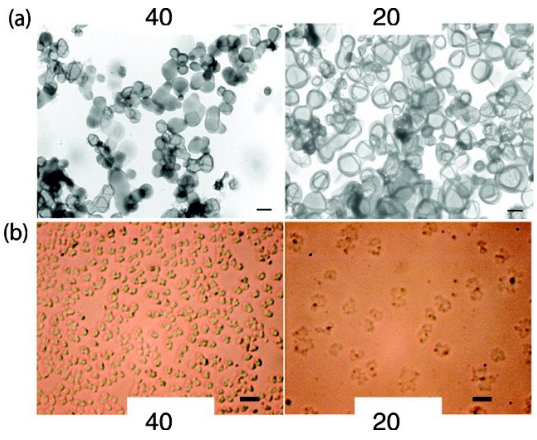
Julien E. Gautrot and X. X. **Zhu**, Shape Memory Polymers Based on Naturally-Occurring Bile Acids. *Macromolecules*, 2009, 42 (19), pp 7324–7331.



Andr Plante, Damien Mauran, Simo P. Carvalho, J. Y. S. Danny Pag, Christian **Pellerin** and Olivier Lebe, Tg and Rheological Properties of Triazine-Based Molecular Glasses: Incriminating Evidence Against Hydrogen Bonds. *J. Phys. Chem. B*, Article ASAP.



Tribet, C. Diab, T. Dahmane, M. Zoonens, J.-L. Popot and F. M. **Winnik**, Thermodynamic Characterization of the Exchange of Detergents and Amphipols at the Surfaces of Integral Membrane Proteins. *Langmuir*, 2009, 25 (21), pp 12623–12634 .



Jie He, Xia Tong, Luc Tremblay and Yue **Zhao**, Corona-Cross-Linked Polymer Vesicles Displaying a Large and Reversible Temperature-Responsive Volume Transition. *Macromolecules*, 2009, 42 (19), pp 7267–7270.

4) Bon Coups/Research Highlights

« Julian **Zhu** et ses collègues font état de progrès vers un matériau plus résistant aux caries dentaires qui utilisent des produits du corps humain. La flèche blanche pointe vers un remplissage à base de "composite". » Extrait de Physorg.com.

Un article publié dans le périodique ACS Applied Materials & Interfaces (M. A. Gauthier, Z. Zhang, X. X. **Zhu**, "New Dental Composites Containing Multi-methacrylate Derivatives of Bile Acids: A Comparative Study with Commercial Monomers", *ACS Applied Materials & Interfaces*, 1, 824-832, 2009.) a attiré beaucoup d'attention des medias. Ils ont reçu des appels téléphoniques ou courriels des journalistes de National Geographic News, Reuters, Berliner Zeitung, le quotidien en ligne RueFrontenac.com, etc. La nouvelle a été rapportée sur les sites web un peu partout au niveau international (même si certaines informations ne sont pas exactes), y inclus ACS, Yahoo Health, Fox News, The Times, Science Daily, Medical News Today, First Science, Lab Spaces, World Dental, Canada.com, Canadanews.net, Calgary Herald, Bester News, Impact Lab, The Post Chronicle, Times Colonist, World Bulletin, Straits Times, Times of India, Natural Dentistry, Science Centric, Med India, Daily India, World News Australia, Kiwibox, South Asia News, Index China, Sunday Tribune, Dentist Chicago, Iran Daily, etc.

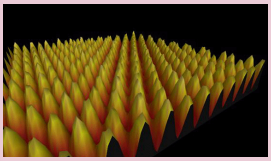
" Bravo à Julian et à son équipe pour cette percée et pour contribuer, de plus, à transmettre le message auprès du public de l'infinie utilité de la chimie dans la vie quotidienne."

Robert Prud'homme

"Chemist Julian **Zhu** at the University of Montreal in Canada and colleagues mixed bile acids with chemical fillers to form a resin that hardens into a tough plastic upon exposure to blue light." Taken from National Geographic News.

An article published in the journal of ACS Applied Materials & Interfaces (M. A. Gauthier, Z. Zhang, X. X. **Zhu**, "New Dental Composites Containing Multi-methacrylate Derivatives of Bile Acids: A Comparative Study with Commercial Monomers", *ACS Applied Materials & Interfaces*, 1, 824-832, 2009) has attracted much media attention. They have received phone calls or emails from journalists from National Geographic News, Reuters, Berliner Zeitung, the daily online RueFrontenac.com, etc. The news was reported on websites across the international level (although some information is not accurate), including ACS, Yahoo Health, Fox News, The Times, Science Daily, Medical News Today, First Science, Lab Spaces, World Dental, Canada.com, Canadanews.net, Calgary Herald, Bester News, Impact Lab, The Post Chronicle, Times Colonist, World Bulletin, Straits Times, Times of India, Natural Dentistry, Science Centric, Med India, Daily India, World News Australia, Kiwibox, South Asia News, Index China, Sunday Tribune, Dentist Chicago, Iran Daily, etc.

5) Post-Doctoral position



STM image of the basal plane of graphite, measured under ambient conditions. Image dimensions: 2 nm X 3 nm. **Rosei**

Dynamics at the Nanoscale by Ultrafast Electron Microscopy

The research program is intrinsically interdisciplinary and requires complementary skills and expertise. The combined expertise of three principal team members (Profs. Bradley Siwick, Jean-Claude Kieffer and Federico **Rosei**) creates a special opportunity for collaborative research on the development of a Dynamic Transmission Electron Microscope (DTEM) to investigate dynamic processes such as nucleation and growth at the nanoscale. The Team is reinforced by the unique opportunity to collaborate with the UEM/DTEM Group at Lawrence Livermore National Lab (LLNL). We are looking for a suitable post-doctoral candidate to lead this effort. The project will provide a range of opportunities for independent, world-class research. The ideal candidate will be:

1. A Ph.D in Physics/Chemistry/Materials Science with strong experience in Transmission electron microscopy with an interest in studying dynamic processes at the nanoscale with novel probes. Some background/ interest in optics is preferred, but not necessary.

Or alternatively

2. A Ph.D in Physics/Chemistry/Materials Science with strong experience in ultrafast laser technology and an interest in ultrafast materials science with non-spectroscopic probes.

To apply, send a cover letter with description of research interests, personal goals and interest in this particular project, together with a CV and full publication list and the contact information for 3 references to the attention of Prof. Federico **Rosei** (rosei@emt.inrs.ca)with CC to Prof.s Jean Claude Kieffer (kieffer@emt.inrs.ca) and Bradley Siwick (bradley.siwick@mcgill.ca).

Applicants with multiple post-doc experiences or with more than 4 years of post-PhD experience will not be considered.

*References: *

1. W. E. King, G. H. Campbell, A. M. Frank, B. W. Reed, J. Schmerge, B. J. Siwick, B. C. Stuart, P. M. Weber, /Ultrafast Electron Microscopy in Material Science, Biology and Chemistry/, J. Appl. Phys. 97 (2005), Art. No. 111101.

2. Judy S. Kim, Thomas LaGrange, Bryan W. Reed, Mitra L. Taheri, Michael R. Armstrong, Wayne E. King, Nigel D. Browning, and Geoffrey H. Campbell, / Imaging of Transient Structures Using Nanosecond in Situ TEM,/ Science 321 (2008) 1472.

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