For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Dr. David Christopher Braddock
Department of Chemistry
Imperial College London
U.K.

Title: Studies on Halogenated Marine Natural Products as Inspired by their Probable Biogeneses

Date: November 3, 2014 (Monday)

Time: 4:30 p.m.

Venue: L3
Science Centre

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Contact Person:
Prof. Henry N.C. Wong

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Dietmar Kuck
Department of Chemistry
Bielefeld University
Germany

Title: Ongoing and New Excitement on Tribenzotriquinacene and Centrohexaindane Chemistry

Date: November 6, 2014 (Thursday)

Time: 2:30 p.m.

Venue: Room C2
Lady Shaw Building

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Contact Person:
Prof. H.F. Chow

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Peter J. Sadler
Department of Chemistry
University of Warwick, UK

Title: The Elements of Life and Medicines

Date: November 10, 2014 (Monday)

Time: 4:30 p.m.

Venue: L3, Science Centre

< Abstract >

Prof. Sadler will make an element-by-element journey through the periodic table and identify elements which are essential for human life. However, somewhat similar to Mendeleev's chemical periodic table in 1869, there are gaps and scientists do not have enough knowledge to fill them. Are essential elements all coded for by the human genome? In general, codes are not just for elements, but for specific chemical species, for the element, its oxidation state, type and number of coordinated ligands, and the coordination geometry. Human and microbial life are symbiotic. The periodic table of human life might therefore also include elements essential for microorganisms. The periodic table offers potential for novel therapeutic and diagnostic agents based not only on essential elements, but also on non-essential elements, and radionuclides.

Biography:

Peter Sadler obtained his BA, MA and DPhil at the University of Oxford. Subsequently he was a Medical Research Council Research Fellow at the University of Cambridge and National Institute for Medical Research. From 1973-96 he was Lecturer, Reader and Professor at Birkbeck College, University of London, and from 1996-2007 Crum Brown Chair of Chemistry at the University of Edinburgh. In June 2007 he took up a Chair in Chemistry at the University of Warwick and was Head of Department for 3 years. He is a Fellow of the Royal Society of Edinburgh (FRSE) and the Royal Society of London (FRS), a European Research Council Advanced Investigator, and Mok Hing-Yiu Distinguished Visiting Professor at the University of Hong Kong. Recently he was Marlies and Hans Zimmer International Scholar at the University of Cincinnati, Davison Lecturer at MIT, Distinguished Lecturer at Roger Williams University, Rhode Island, Glenn Seaborg Lecturer at the University of California, Berkeley, and Australian Academy of Science Selby Fellow. His research interests are centred on the chemistry of metals in medicine (Webpage: http://www2.warwick.ac.uk/fac/sci/chemistry/research/sadler/)

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Contact Person:
Prof. Kevin W.P. Leung

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Professor Jaehong Kim
School of Engineering & Applied Science
Yale University
U.S.A.

Title: Engineering Light: Wavelength Conversion Materials for Environmental Applications

Date: November 12, 2014 (Wednesday)

Time: 2:30 p.m.

Venue: LG23
Science Centre

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Contact Person:
Prof. Jimmy C. Yu

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Chien-Hong Cheng
Department of Chemistry
National Tsing Hua University

Title: Host and dopant materials for electroluminescent devices

Date: November 13, 2014 (Thursday)

Time: 2:30 p.m.

Venue: L5
Science Centre

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Contact Person:
Prof. Zuowei Xie

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Mark Howarth
Department of Biochemistry
University of Oxford
U.K.

Title: Flesh-eating bacteria, spontaneous amide bond formation, and polymers to fish for cancer cells

<< Abstract >>

Amide bond formation in water between an amine and a carboxylic acid is usually thermodynamically unfavourable. A special feature of the chemistry of the human pathogen Streptococcus pyogenes enables efficient spontaneous amide bond formation within particular proteins. We have harnessed this chemistry to generate an irreversible peptide-protein interaction (SpyTag/SpyCatcher). This reaction is rapid, high-yielding, genetically encodable and specific on cells.

Complementation of this split protein has been analyzed by NMR and crystallography and advanced by rational and library-based engineering.

Applications of this protein padlock will be presented for resisting forces, enhancing enzyme stability, and for construction of protein tentacles, to enhance the capture of circulating tumour cells (CTCs) from blood, one of the most promising ways to enhance early diagnosis of cancer.

Date: November 14, 2014 (Friday)

Time: 4:30 p.m.

Venue: L1, Science Centre

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Contact Person:
Prof. Jiang Xia

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Karel Dušek
Institute of Macromolecular Chemistry
Academy of Sciences of the Czech Republic

Title: Swelling and swelling transitions of polymer networks – effect of external and internal constraints

<< Abstract >>

Limited swelling is one of the most typical characteristics of polymer networks. Stretching of network chains by absorption of liquids is opposed by tendency of mixing of solvent molecules with polymer segments, and eventually equilibrium is established. Additional crosslinking or a change in the number and strength of interactions can render the system thermodynamically unstable which can result in thermodynamic instability resulting in phase separation or volume phase transition. Such behavior can be described even by simple models of rubber elasticity and polymer solutions. The states of network chains during formation play a crucial role.

In many instances, the swelling behavior is affected by constraints, either of internal or external nature. Interactions between network chains, their finite extensibility, or trapped entanglements rate among the most typical internal constrains. External constraints are typical for various biomedical and technical constructs. The swollen network can get anisotropic and the degree of swelling can increase or decrease depending on the type and geometry of the constraints. Expansive stresses generally increase the degree of swelling and facilitate the volume phase transition while compressive stresses act oppositely. Swelling of an adhering cross-linked film is one of the typical examples of compressive constrains. This adhesion constrain is relatively more important for swelling of lightly cross-linked networks while for highly cross-linked layers, the finite extensibility effect prevails. Very important is the quantification of mutual constrains of constructs of two networks, such as in core-shell particles (the shell exhibits a concentration gradient) or in double networks (interpenetrating networks). In swollen particulate composites with cross-linked matrix both the compression and expansion strains are operative and for their quantification the physical models have to be implemented into a finite element framework.

Date: November 17, 2014 (Monday)

Time: 10:30 a.m.

Venue: L4, Science Centre

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Contact Person:
Prof. Chi Wu

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Miroslava Dušková-Smrčková
Institute of Macromolecular Chemistry
Academy of Sciences of the Czech Republic

Title: Rheology and Swelling of Double-Network Hydrogels. Target to Application.

<< Abstract >>

Double-network hydrogels were prepared by sequential polymerization of 2-hydroxyethyl methacrylate (HEMA) or/and glycerol monomethacrylate (GMA) containing different amounts of cross-linker. The first network could be homogeneous or inhomogeneous (porous) depending on the amount and thermodynamic quality of the diluents present during gel formation (water, aqueous solution of magnesium perchlorate, dimethylsulfoxide). The second network was formed in fully formed first network by UV-initiated crosslinking of the monomer swollen in the first network.

The changes occurring during the cross-linking reaction and in the final state were monitored by rheometry and WAXS/SAXS methods. The G'-values of swollen samples generally increased by introducing the second network. Especially remarkable effect was obtained when heterogeneous first network was interpenetrated by the second network reinforcing the matrix and filling up the pores. The G'-values of the double network depended on the cross-linker concentration of second network but, paradoxically, in the case of pHEMA/pHEMA double network the storage modulus decreases with increasing cross-linker concentration of the second network. At some cross-linker levels, the moduli of double networks are only a fraction of the first network value. The effect is the stronger the higher is the cross-linker concentration of the first network.

This result could be explained by phase separation occurring during formation of the second network. When the concentration of the cross-linker of the second network is high, large branched molecules appear in the system at low monomer conversions and the ternary system (monomer-branched polymer-network 1) gets thermodynamically unstable. The shear modulus of the phase-separated morphology is lower than that of the corresponding homogeneous morphology as has already been established for single pHEMA network.

For homogeneous double networks, the values of the modulus were compared with models based on the two-network hypothesis of Hanson and Tobolsky. The swelling behavior of double network hydrogels prepared from pHEMA first network interpenetrated by pGMA reveals a very interesting swelling behavior. Their swelling degrees in water and in DMSO show that the first network expands by a factor of 40 with respect to its dry mass (swelling in water) or even 65 (swelling in DMSO) yet maintaining reasonable mechanical properties, whereas for the single pHEMA network this factor drops to 1.7 (water) or 9 (DMSO).

These interpenetrating hydrogels are biocompatible, they can host cultivated cells and their deformation behavior makes them good candidates for application in tissue engineering. Medical application of hydrogels will be also discussed.

Date: November 17, 2014 (Monday)

Time: 2:30 p.m.

Venue: Room G34, Lady Shaw Building

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Contact Person:
Prof. Chi Wu

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Akihiro Orita
Department of Applied Chemistry
Okayama University of Science
Japan

Title: Syntheses of Functional Acetylenes: Double Elimination Protocol and $Ph_2P(O)$ Protection

Date: November 28, 2014 (Friday)

Time: 2:00 p.m.

Venue: Room 158
Science Centre

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Contact Person:
Prof. Henry N.C. Wong

For favour of posting

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Toyonobu Usuki
Department of Materials and Life Sciences
Faculty of Science and Technology
Sophia University

Title: Natural Products Research: Organic Synthesis and Ionic Liquids

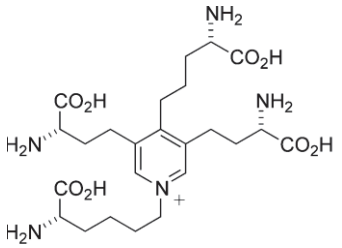
Date: November 28, 2014 (Friday)

Time: 4:30 p.m.

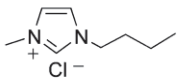
Venue: L1, Science Centre

<< Abstract >>

The lecture highlights recent developments of natural products research in our laboratory: 1) chemical synthesis of COPD biomarker desmosines and its application to LC-MS/MS analysis in the clinical samples; 2) new extraction/isolation techniques of plant natural products such as shikimic acid, geraniol, and caffeoylquinic acids, from leaves utilizing ionic liquid that dissolve cellulose.



desmosine



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T. Usuki, N. Yasuda, M. Yoshizawa-Fujita, M. Rikukawa "Extraction and Isolation of Shikimic Acid from *Ginkgo Biloba* Leaves Utilizing an Ionic Liquid that Dissolves Cellulose" *Chem. Commun.* **2011**, *47*, 10560-10562.

Toyonobu Usuki, born in 1977, obtained his B.S., M.S., and Ph.D. degrees in chemistry under the supervision of Professor Masahiro Hirama from Tohoku University, Sendai, Japan, in 2000, 2002, and 2005, respectively. Then, he worked as a JSPS Postdoctoral Fellow for Research Abroad in the laboratory of Professor Koji Nakanishi at the Department of Chemistry, Columbia University, New York, USA, from 2005 to 2007. After the industry experience as a researcher, he joined the Department of Materials and Life Sciences, Sophia University, Tokyo, Japan, as an Assistant Professor in 2008. Since 2013, he is an Associate Professor at the same University. His research interests include natural products chemistry, organic chemistry, medicinal chemistry, and bioorganic chemistry.

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Contact Person:
Prof. Tony K.M. Shing