



5th Global Chemistry Congress

September 04-06, 2017 | London, UK

Scientific Tracks & Abstracts Day 1

Global Chemistry 2017

Sessions:

Day 1 September 04, 2017

Organic Chemistry | Physical and Theoretical Chemistry | Nanoscience and Technology

Session Chair
James Johnston

Victoria University of Wellington, New Zealand

Session Co-Chair
Luisa Di Paola

Università Campus Biomedico, Italy

Session Introduction

Title: Electronic and magnetic behaviors of 2D atom-thin layers: Graphene, black phosphorus, hexagonal boron-nitride, and MoS₂

Junji Haruyama, Aoyama Gakuin University, Japan

Title: Preparation of Modified Thionucleobases and Thionucleosides Using Room Temperature Ionic Liquids as Solvents

Qinguo Zheng, Aston University, UK

Title: From single-electron processes to multielectron handling and storage at the molecular level: designing super-electrophores for the next generation of prototypes of Transducers for man-made photosynthesis?

Philippe Lainé, Université Paris Diderot, France

Title: The structural formula of proteins

Luisa Di Paola, Università Campus Biomedico, Italy

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Electronic and magnetic behaviors of 2D atom-thin layers: Graphene, black phosphorus, hexagonal boron-nitride and MoS₂

Junji Haruyama^{1, 2}¹Aoyama Gakuin University, Japan²University of Tokyo, Japan

Two-dimensional (2D) atom-thin layers have attracted significant attention after the discovery of primitive fabrication method of graphene (i.e., mechanical exfoliation of graphite using scotch tapes). As a van-deer Waals engineering, various atom-thin layers and those hybridization are recently studied. In the talk, first, I present magnetism and spintronics arising from edges of 2D atom-thin layers (e.g., graphene, few-layer black phosphorus (BP), hexagonal boron-nitride (hBN), and molybdenum disulfide (MoS₂)). I create nanomesh (NM) structures, consisting of honeycomb like array of hexagonal nano-pores, with specified pore-edge atomic structure (i.e., zigzag type) on individual layers. Interestingly, hydrogen-terminated graphene NM (H-GNM) shows flat-band ferromagnetism, while it disappears in oxygen-terminated GNM (O-GNM). On the other hand, O-BPNM exhibits large ferromagnetism (100 times) due to ferromagnetic spin coupling of edge O-P bonds, whereas it is eliminated in H-BPNM. O-hBNNM also shows large ferromagnetism due to edge O-B and O-N bonds, while it disappears in H-hBNNM. These are also highly sensitive to annealing temperatures to form zigzag pore edge. These open a considerable avenue for realizing 2D atom-thin flexible magnetic and spintronic devices, fabricated without using rare-earth magnetic atoms. Second, I show creation of the world-thinnest Schottky junction on few-layer MoS₂, one of the transition metal dichalcogenides. The 2H-phase of MoS₂ has direct band gaps of 1.5–1.8 eV. It is demonstrated that electron-beam (EB) irradiation to the 2H-phase causes semiconductor-metal transition to 1T-phase and atomically-thin Schottky junction with barrier height of 0.13–0.18 eV is created at the interface of 2H/1T regions. These findings also indicate a possibility that the effective barrier height is highly sensitive to electrostatic charge doping and almost free from Fermi-level pinning when assuming predominance of the thermionic current contribution. This EB top-down patterning opens the possibility to fabricate in-plane lateral heterostructure FETs, which have shown promising scaling prospects in the nanometer range, and/or local interconnects directly with metallic phase (1T) between (2H)MoS₂ transistors, resulting in ultimate flexible and wearable in-plane integration circuits without using 3D metal wirings. Finally, I will also briefly talk about introduction of spin-orbit interaction into graphene by nano-particle decoration.

Biography

Junji Haruyama graduated from Waseda University, Tokyo, Japan, in 1985. He joined Quantum Device Laboratory, NEC Corporation, Japan and worked until 1994. He received PhD in Physics from Waseda University in 1996. During 1995–1997, he worked with the University of Toronto, Canada and also Ontario Laser and Lightwave Research Center (Canada) as a Visiting Scientist. Since 1997, he has been working at Aoyama Gakuin University as a Professor. He was also a Visiting Professor at NTT Basic Research Laboratories, Institute for Solid State Physics, University of Tokyo, and Zero-emission Energy Center, Kyoto University, Japan. He has been also a Principal Researcher at Air-Force Office of Scientific Research (AFOSR), USA, since 2010. He has peer review publications over 100 and four patents, and also invited talks over 150.

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Preparation of modified thionucleobases and thionucleosides using room temperature ionic liquids as solvents

Qinguo Zheng and Xiaomei Hu
Aston University, UK

Nucleoside chemistry is an important research area in drug development. Various kinds of chemical modified nucleobases, nucleosides, nucleotides and oligonucleotides have shown biological activities. One of the challenges associated with the nucleoside chemistry is the poor solubility of these compounds in the commonly used organic solvents. The conventional polar solvents such as DMF, DMSO and N-methylpyrrolidone (NMP) have been employed, but they are hazardous to the environment. Thus, there is a need to develop alternative solvents and technologies for nucleoside chemistry due to the increasing need for protecting the environment. Good solubility of these chemicals in ionic liquids provides an opportunity to solve this problem. Considering the advantages of using ionic liquids for nucleoside chemistry, as a part of our continuous efforts in utilization of ionic liquids for various synthetic reactions, we have synthesized modified thionucleobases and thionucleosides using various RTILs with the aim of developing anti-viral and anti-cancer agents. Ionic liquids 1-methoxyethyl-3-methylimidazolium methanesulfonate {[MeOEtMIM]⁺[CH₃SO₃]⁻} and 1-methoxyethyl-3-methylimidazolium trifluoroacetate {[MeOEtMIM]⁺[CF₃COO]⁻} have been used as solvents and catalysts for the preparation of modified thionucleobases and thionucleosides. These reactions proceeded effectively and efficiently in various ionic liquids.

Biography

Qinguo Zheng is the Professor in School of Life & Health Sciences at Aston University, UK. His research interests are development of novel methodologies for synthesis of modified nucleic acids and peptide nucleic acids, and their use as potential antisense therapeutic agents. He has completed post doctorate from MRC Toxicology Unit, University of Leicester, UK.

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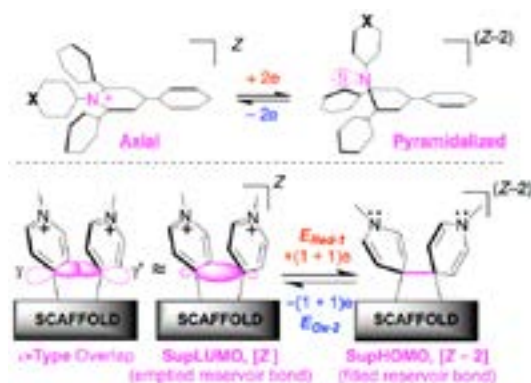
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From single-electron processes to multi-electron handling and storage at the molecular level: designing super-electrophores for the next generation of prototypes of transducers for man-made photosynthesis?

Philippe P Lainé¹

Paris Diderot University, France

As part of our continuing research program devoted to artificial photosynthesis, which relies on multi-photon and multi-electron processes, we have recently revisited the physical chemistry, and especially the electrochemistry of pyridinium derivatives as multi-electron acceptors. Here we report on the design and rich electrochemistry of two classes of super-electrophores that share the uncommon feature of being able to undergo a two-electron reduction in a single step. The functioning of these super-electrophores relies on the intriguing phenomenon of potential inversion which can be implemented in different ways that actually correspond to two different electrochemical paradigms. On the one hand, there are polyaryl-substituted pyridiniums referred to as branched Expanded Pyridiniums (EPs), that are multifunctional platforms featuring good electrophoric properties and also effective chromophoric and luminophoric activities. On the other hand, there are specifically assembled multi-electrophoric compounds, referred to as Structronic Assemblies (SAs), characterized by their electrochemical hysteresis, that allow the storage of electrons in the form chemical bonds used as electron reservoirs. Special emphasis is herein placed on the rationalization of electrophoric properties and the mechanisms that explain the unusual electrochemical behavior of these two classes (EPs & SAs) of super-electrophores. These studies combine various experimental methods (crystallography, NMR, electrochemistry as well as *in situ* UV-vis. and IR spectro-electrochemistry) with theoretical modeling. Finally, the manner by which these types of super-electrophores (EPs & SAs) could be used within the framework of research devoted to man-made photosynthesis will be evoked.



Biography

Philippe P Lainé has been trained as a Chemist at University Pierre et Marie Curie (UPMC) Paris, France. After his PhD and Post-doctorate degree, he became Research Assistant at CNRS (University Paris-Sud, Orsay and University Paris Descartes, Paris) and then CNRS Research Director at University Paris Diderot (ITODYS Lab.). His research interests span from Molecular Electronics to Solar Energy Conversion and Storage. His expertise is in Molecular Chemistry, Supramolecular and Bio-Inorganic Photochemistry as well as Molecular Electrochemistry. His current research activity is devoted to molecular and supramolecular transduction for energy and information.

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The structural formula of proteins

Luisa Di Paola¹ and Alessandro Giuliani²

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The identification of computational tools to analyze the relationship between protein function and structure is a hot research field since 1960s. Despite the advancement of both experimental methods and computational tools, it is still lacking a benchmark methodology identifying clearly and without biases the relationship between structural properties and recognized protein functions. Inspired by the classical theory of Debye-Huckel, we propose a new interpretation of protein contact networks so to define the structural formula of proteins as the network of non-covalent intramolecular bonds. In this way, the peptide bonds would embody the role of nuclear bonds in organic molecules, too strong to determine the adaptation of the molecule to environment. On the other hand, non-covalent intramolecular bonds, which rearrange during protein adaptation of proteins to environment stimuli, represent the right level of analysis to define protein functionality. As for the organic molecules, through chemical graph theory, it is possible to identify key topological parameters fitting with protein properties (protein stability, allostery). The predictive potentiality of the methodology is stunning: once the structural data are available (from X-ray crystallography on NMR), the protein contact network formalism may allow quantifying protein functionality (such as allosteric sites in enzymes or hot spot residues in protein-protein interactions).

Biography

Luisa Di Paola completed her Doctorate in Chemical Industrial Processes at University Roma "La Sapienza". She collaborated, during her doctorate, with prof. J M Prausnitz and H Blanch at University of California at Berkeley. Currently, she is an Assistant Professor at University Campus Biomedico in Rome. Her research interests span from bioinformatics to biotechnological processes. She is author of 45 papers published in international journals and books. She is an Editor-in-chief of the *International Journal of Biochemistry Research & Review*, Associate Editor of *Journal of Physical Chemistry & Biophysics*; *Advances in Systems Biology and; International Journal of Medical Biotechnology & Genetics (IJMBG)*.

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Notes:

Sessions:

Day 1 September 04, 2017

Nanoscience and Technology | Organic Chemistry | Green Chemistry and Renewable Resources

Session Chair

Mahendra Nath Roy

University of North Bengal, India

Session Chair

Luisa Di Paola

Università Campus Biomedico, Italy

Session Introduction

Title: Aulana ®: Novel Nanogold Coloured Wool Textiles for Luxury Markets

James Johnston, Victoria University of Wellington, New Zealand

Title: Palladium-Catalyzed Domino Heck/Aryne Carbopalladation/C-H Functionalization: Synthesis of Heterocycle-Fused 9,10-Dihydrophenanthrenes

Tuanli Yao, Shaanxi University of Science and Technology, China

Title: Synthesis of Some Novel Class of Isoxazolidine & Isoxazoline Derivatives using Some Novel Class of Nitrones via 1,3-Dipolar Cycloaddition Reaction using Greener Methodologies

Bhaskar Chakraborty, Sikkim Government College, India

Title: Regulation of Open Porosity and Strength in Ceramics Based on Electro Corundum and Porcelain Binder

Zaw Ye Maw Oo, D. Mendeleev University of Chemical Technology, Russia

Title: Photochemistry, Isolations and Some Pharmacological Studies of Ethanol Leaf Extract of *Piliostigma Thoningii*

Fanna Inna Abdulrahman, University of Maiduguri, Nigeria

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Aulana®: Novel Nanogold Coloured Wool Textiles for Luxury Markets

James H Johnston and Thomas Borrmann
Victoria University of Wellington, New Zealand

Aulana® is a new technology and luxury nanogold-wool textile product suite, which innovatively combines the nanoscience of gold with wool fibre proteins to produce a boutique colour range of nanogold-wool textiles for high value international luxury markets. Aulana® captures the exciting and unique opportunity whereby the prestige and high value of gold are linked directly to the high quality of New Zealand wool through the use of nanogold as novel stable colourfast colourants in the wool, for the international high quality fashion apparel, luxury textiles, carpet and rug markets¹⁻³. This utilises the localised surface plasmon resonance properties of nanogold wherein the colour exhibited by the gold is dependent upon the size and shape of the nanogold particles and the dielectric constant of the surrounding material^{3,4}. These particles are chemically bound to the sulfur and nitrogen containing amino acids in the wool fibre proteins on the cuticle surfaces and edges (Fig. 2). Spherical particles of gold about 10-20 nm are pink-red in colour³⁻⁵. Precise control of the particle size enables the colour to be changed progressively through shades of pink, red, purple, blue-grey to grey (Fig 3.) Gold nanorods potentially offer shades of blue, green and red colours, depending upon the aspect ratio of the gold nanorods⁶. Nanogold colourants cannot fade or denature in sunlight and hence the nanogold coloured wool products exhibit excellent lightfastness. Electronmicroscopy and associated X-ray elemental mapping and X-ray photoelectron spectroscopy show the nanogold is primarily bound to N and S entities on the cuticle edges. The proprietary Aulana® technology and product suite has been developed on the laboratory scale and progressed to pilot and commercial scale production for loose wool, combed top wool, yarn (Fig. 3) and fabric as required, using stainless steel textile dyeing equipment. Noble Bond Ltd which owns the Aulana® brand, is commercialising Aulana® products for use in luxury apparel, upholstery textiles, rugs and carpets. This utilises Noble Bond's network of businesses concerned with the wool industry and high value wool products.



Biography

James H Johnston has a Personal Chair in Chemistry at Victoria University of Wellington. He is a Principal Investigator at New Zealand Product Accelerator. He works at university-industry interface where he is recognized nationally and internationally for his research contributions and achievements in materials science, nanotechnology and new chemical technologies and product developments. This has led to the establishment of three new start-up companies to facilitate commercialization of his and co-workers research. He is a Fellow of the Royal Society of New Zealand and of the New Zealand Institute of Chemistry.

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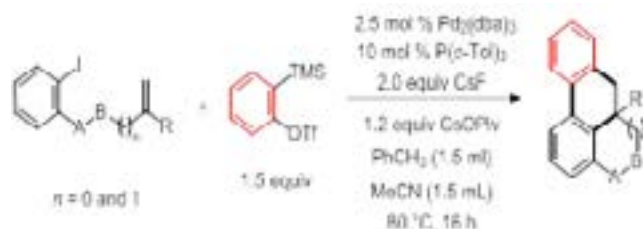
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Palladium-catalyzed domino Heck/aryne carbopalladation/C-H functionalization: Synthesis of heterocycle-fused 9, 10-dihydrophenanthrenes

Tuanli Yao

Shaanxi University of Science and Technology, China

Arynes generated from the corresponding *o*-(trimethylsilyl) aryl triflates have emerged as powerful synthons in organic synthesis. Aryne annulation reactions with intramolecular C-H functionalization can be a powerful method for the synthesis of polycyclic compounds. We developed a novel palladium-catalyzed domino Heck/aryne carbopalladation/C-H functionalization reaction using *in situ* generated arynes, in which three new C-C bonds and a carbon quaternary center are formed. This methodology affords moderate to excellent yields of heterocycle-fused 9, 10-dihydrophenanthrenes.



Biography

Tuanli Yao has completed his PhD from Iowa State University and Post-doctoral studies from University of California, Berkeley. He worked as Senior Scientist at Deciphera Pharmaceuticals and Associate Researcher at University of Kansas. Currently, he is a Professor at Shaanxi University of Science & Technology. His research interests include "Aryne chemistry, electrophilic cyclization and palladium catalysis". He has published more than 30 papers in reputed journals.

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Synthesis of some novel class of isoxazolidines & isoxazoline derivatives using some novel class of nitrones via 1,3-dipolar cycloaddition reaction using greener methodologies

Bhaskar Chakraborty

Sikkim Government College, India

Some environment friendly greener methodologies have been described for the synthesis of new isoxazolidine and isoxazoline derivatives using new nitrones via 1,3-dipolar cycloaddition reactions. These also include synthesis of bisisoxazolidine and bisisoxazoline derivatives synthesized from glyoxal and terephthalaldehyde respectively. Few new spiro isoxazolidine derivatives have been also reported using new dipolarophiles. Furthermore, these new isoxazolidine and isoxazoline derivatives are found to have vast synthetic potential as they could be used as precursors for the synthesis of a variety of new organic molecules including peptides, 1,3-amino alcohols with potential biological activities. For the synthesis of peptides, it has been observed that CDMT (chloro dimethyl triazine) has found to be better coupling reagent than conventional DCC (dicyclohexyl carbodiimide) due to the formation of insoluble by-product (N,N-dicyclohexylurea) and purification becomes tedious. The new nitrones reported are synthesized from dihydropyran, chlorohydrin and formamide respectively. Significant increase in the reaction rates, excellent yields, and high selectivity (diastereo and regioselectivity) are the important features observed in these cycloaddition reactions following greener methodologies. It has been observed that high diastereoselectivity in these cycloaddition reactions have been observed when the reactions are performed in water. Synthesis of aldehydes and ketones with new nitrones in atom efficient reactions are the most attractive features as they have future scopes in these reactions. The side products (enamines) obtained during the synthesis of aldehydes and ketones has been successfully utilized as new dipolarophiles in these cycloaddition reactions for the synthesis of spiro cycloadducts.

Biography

Bhaskar Chakraborty is a Professor and Head of the department of Chemistry at Sikkim Government College (Sikkim State University), Gangtok, Sikkim, India with 23 years of teaching experience in teaching undergraduate and post graduate Chemistry students. Has active research experience of 22 years in synthetic organic chemistry in the field of "Nitrono cycloaddition reactions and their further applications following green chemistry methodologies". Supervisor of research scholars leading to Ph.D degree for 14 years. Has published 60 nos of research publications in international and national journals of high repute and impact factors.

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Regulation of open porosity and strength in ceramics based on electro corundum and porcelain binder

Zaw Ye Maw Oo

D. Mendeleev University of Chemical Technology, Russia

The most important characteristic of ceramic materials, which determines most of the physical properties, is the porosity. Porous materials are commonly used as catalyst supports in the processes of oxidation, hydrogenation and dehydrogenation at high temperature, corrosion in feed processing - corrosive environments at endothermic and exothermic reactions. In particular, for this purpose, various types of corundum materials with high chemical inertness. Porosity materials due to the high porosity and the peculiar structure have specific properties dramatically different from those of the corresponding chemical composition of dense materials [1, 2]. There was obtained a highly porous material of alumina carriers for catalysts. The filler used to be electro corundum, as reinforcing filler, forming on fire a bundle used porcelain. The samples were prepared by impregnating the ceramic slurry polyurethane foam (PUF), followed by drying and calcining at 1350 °C, 1450 °C. The flexural strength of the sintered samples without PUF with burnable additives showed from 19 to 151 MPa, an open porosity of 17 to 25 %, and for the samples duplicated PUF after firing showed the porosity was 60 - 65 %, the compressive strength of 3.5 MPa.

Biography

Zaw Ye Maw Oo has completed his PhD at the age of 26 years from Mendeleev University of Chemical Technology of Russia by government scholarship. Now he is attending postdoctoral studies in that university. He has published more than 5 papers in reputed journals.

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Photochemistry, isolations and some pharmacological studies of ethanol leaf extract of *Piliostigma thonningii*

Fanna Inna Abdulrahman
University of Maiduguri, Nigeria

This study was aimed at evaluation of phytochemical constituents and the effect of ethanol leaf extract of *Piliostigma thonningii* on the central and peripheral nervous systems in laboratory animals. Fresh leaves of *Piliostigma thonningii* were air-dried, pulverized and extracted using soxhlet extraction technique with ethanol 148.24% w/w after being concentrated. The extract was screened for phytochemicals using standard methods. 20 g of the ethanol extract was subjected to column chromatographic (CC) analysis using ethyl acetate and n-butanol as mobile phase at different ratios and silica gel of 60-120 mesh as the stationary phase. Fractions obtained with similar retention factor (R_f) using thin layer chromatography (TLC) were combined, coded and subsequently screened for phytochemicals. Subsequent purification of fraction PTE3 was carried out using CC (ethyl acetate and methanol were used as mobile phase at different ratios) and TLC until a sub-fraction PTE34 among other fractions gave a single spot on TLC and had a melting point of 102-103°C. The phytochemical studies of the ethanol leaf extract of *Piliostigma thonningii* revealed the presence of some useful chemical compounds such as flavonoids, cardiac glycosides, tannins, saponins, and terpenoids. The pharmacological effects of *Piliostigma thonningii* was determined by examining the effects of the leaf extract on phenobarbitone sleeping time, analgesic and muscle relaxant activities using experimental animals. The analgesic effect of the leaf extract was evaluated with acetic acid induced writhing and thermally induced nociception for pain. It was observed that the extract conferred 48.00 and 57.20% protection from writhes induced by acetic acid on mice when extract doses of 200 and 400 mg/Kg were administered. Similarly, there was a significant ($p < 0.5$) dose dependent effect conferred on mice when pain was induced by heat. The extract also had a muscle relaxant effect as 20%, 60% and 80% were observed to slide down an inclined board in a dose dependent manner. The extract also significantly potentiated sleeping time of phenobarbitone dose dependently in rats of which the mean time duration of (72.0±04.64) min, (83.40±02.11) min, and (123.60±11.57) min were observed when rats were administered extract doses of 200, 400 and 600 mg/Kg b wt. Thus, the ethanol leaf extract of *Piliostigma thonningii* was able to provide depressant effects which were shown in its ability to potentiate barbiturate sleeping, analgesia and muscle relaxant effect.

Biography

Fanna Inna Abdulrahman is presently a Lecturer of Organic Chemistry in Department of Chemistry, University of Maiduguri. She completed her PhD in Medicinal Chemistry in 1997. She has published more than 100 research papers in the field of Organic/Medicinal Chemistry and Natural Product. Her current research interest is in the area of Organic/ Medicinal Chemistry and Natural product. She is a Fellow of Chemical Society of Nigeria, Fellow of Institute of Chartered Chemist of Nigeria, Member of West African Network of Natural Products Research Science and Member of Council of the Institute of Chartered Chemist of Nigeria. She was the Head of Department of Chemistry, University of Maiduguri, Borno State, Nigeria.

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Scientific Tracks & Abstracts Day 2

Global Chemistry 2017

Sessions:

Day 2 September 05, 2017

Industrial and Engineering Chemistry | Organic Chemistry | Nanoscience and Technology | Physical and Theoretical Chemistry | Medicinal Chemistry | Environmental Chemistry

Session Chair

Luisa Di Paola

Università Campus Biomedico, Italy

Session Introduction

Title: Catalytic Synthesis of Environmental friendly Polymer Poly Lactic Acid via Continuous Reactive Extrusion: Recent Trends

Satya Dubey, Cranfield University, UK

Title: Encapsulation of β -Cyclodextrin with Vitamine-B and Vitamin-C molecules

Mahendra Nath Roy, University of North Bengal, India

Title: Nanofiber mats fabricated by solution blow spinning as potential substrates for cardiac cell culture

Ewelina Tomecka, Warsaw University of Technology, Poland

Title: Application of the LBET method to an analysis of single and multiple carbon dioxide and methane adsorption isotherms

Mirosław Kwiatkowski, AGH University of Science and Technology, Poland

Title: Isolation and Structural Elucidation of 20 hydroxyecdystone from Vitex doniana Sweet Stem bark (Black plum)

Mustapha abba Tijjani, University of Maiduguri, Nigeria

Title: Concentration of Pb and Cd in Soil and Reed Plant of Busia and Lugari Regions of Western Kenya

Phanice Wangila, University of Kabianga, Kenya

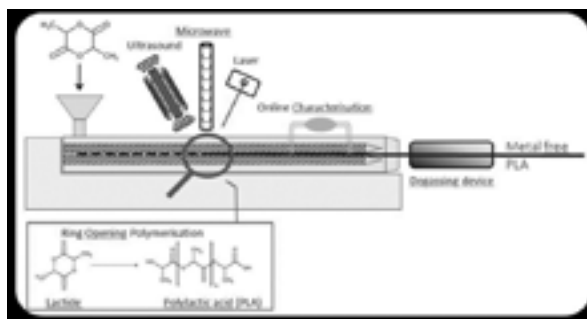
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Catalytic synthesis of environmental friendly polymer poly lactic acid via continuous reactive extrusion: Recent trends

Satya P Dubey, Hrushikesh A Abhyankar, Veronica Marchante and James L Brighton
Cranfield University, UK

The disposal of large amount of polymer waste is one of the major challenges of this century. Use of bio-degradable polymers obtained from sustainable sources presents a solution to this problem. Poly lactic acid (PLA), a bio-degradable polymer, can be synthesized from sustainable sources as corn, starch, sugarcane and chips. Ring opening polymerization (ROP) of lactide monomer using metal/bimetallic catalyst (Sn, Zn or Al) is the preferred method for synthesis of PLA. However, the PLA synthesized using such catalysts may contain trace elements of the catalyst. These catalyst traces are known carcinogens and as such should be (ideally) eliminated from the process. Continuous reactive extrusion of lactide monomer (using the suitable reaction input has the potential to increase the throughput, and this route has been explored in the literature. In this work, reactive extrusion experiments using stannous octoate $\text{Sn}(\text{Oct})_2$ and tri-phenyl phosphine $(\text{PPh})_3$, were considered to perform ROP of lactide monomer using the microwave as an alternative energy (AE) source for activating and/or boosting the polymerization (Figure 1). Implementation of a microwave generator in a section of the extruder is one of the novelties of this research. A simulation model of ROP of PLA was formulated to estimate the impact of reaction kinetic and AE source on the polymerization process. Ludovic[®] software was used for the simulation of continuous reactive extrusion of the process. Experimental and simulated results were compared for the validation of the methodology. This work also highlights the advantages and drawbacks of most conventional metal catalysts, the effect of alternative energies on reaction mechanism, and safe and efficient production of PLA.



Biography

Satya P Dubey is a Research Associate at Cranfield University, UK. He has his expertise in several aspects of material sciences such as polymer, bio-polymer, nano-materials, composites, sustainable material, metal-polymer interfaces etc. His diligent, open and contextual evaluation model based on environmental friendly polymer synthesis creates new pathways for improving polymer industry. He developed this model after years of experience in research, evaluation, teaching and administration both in basic material chemistry research as well as in developing the mathematical model in several research institutions worldwide. The current development made by him considered as a step forward for the production of biodegradable and bio-compostable polymer through more safer and greener method.

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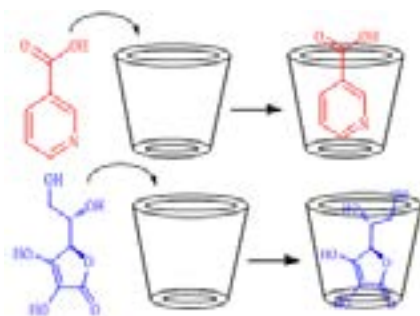
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Encapsulation of β -cyclodextrin with vitamin-B and vitamin-C molecules

Mahendra Nath Roy
North Bengal University, India

We need vitamin B and vitamin C every day for our growth, but if we take them in surplus/less amounts, our growth will be hampered. If these vitamins are taken into our body in encapsulated form, body takes these vitamins according to its requirements and the growth will be normal. Encapsulation of the vitamins is very important to protect these important biomolecules from external hazards, i.e., oxidation, sensitization, photolytic cleavage etc.; for the regulatory delivery of necessary amount of vitamin at the targeted site for a period of time efficiently and precisely and; to prevent overdose. In this work, encapsulation of β -cyclodextrin with two vitamins namely, nicotinic acid and ascorbic acid in aqueous medium have been explored by reliable spectroscopic, physicochemical and calorimetric methods as stabilizer, carrier and regulatory releaser of the guest molecules. Stereochemical nature of the inclusion complexes has been explained by 2D NMR spectroscopy. Surface tension and conductivity studies further support the inclusion process. Isothermal titration calorimetric studies have been performed to determine the stoichiometry, association constant and thermodynamic parameters with high accuracy. The outcomes reveal that there is a drop in ΔS° , which is overcome by higher negative value of ΔH° , making the overall inclusion process thermodynamically favorable. Hence, this exclusive study describes that the inclusion complexes can be used as controlled delivery systems in the field of modern biomedical sciences.



Biography

Mahendra Nath Roy is the Head and Professor in Department of Chemistry at University of North Bengal, India. His research interests are in the areas of "Host-guest inclusion complexes, ionic liquids, solution thermodynamics and polymer chemistry". He reviewed 28 PhD thesis and many referred research papers and authored over 200 research articles and books in Chemistry. He has received award of One Time Grant under Basic Scientific Research from University Grants Commission, Prof. Suresh C Ameta Award from Indian Chemical Society and has been recently awarded with CRSI Bronze Medal 2017 by Chemical Research Society of India for his excellence in chemical research throughout his career.

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Nanofiber mats fabricated by solution blow spinning as potential substrates for cardiac cell culture

Ewelina Tomecka, Michal Wojasinski, Elzbieta Jastrzebska, Michal Chudy, Tomasz Ciach and Zbigniew Brzozka
Warsaw University of Technology, Poland

In recent years, there is a growing interest in the use of nanofibers for cell culture. Nano fibrous materials have many advantages such as: high porosity, high surface to volume ratio and they are structurally similar to extracellular matrix (ECM). Furthermore, nanofibers structure influence on cell orientation, which allow mimicking natural organization of cardiac cells. Most researches use electrospinning for nanofibers fabrication. However, low efficiency of this technique doesn't allow to use it for large-scale production of nanofibers. We propose a rarely used method - solution blow spinning (SBS), which allows scale-up the nanofibers manufacturing process to the commercial level. This work presents the comparison and evaluation of cardiac cell proliferation on poly-(L-lactic acid) (PLLA) and polyurethane (PU) nano-fibrous mats fabricated by SBS. For the experiments, three different cardiac cell lines were used (figure 1). Cell cultures were performed for seven days on non-modified and protein-modified nanofibers surface. Obtained results of cardiac cell culture on investigated surfaces of nanofibers were compared to results of cardiac cell culture on polystyrene (PS) surfaces modified in the same way. The results showed the all types of investigated cells cultured on nanofibers (PLLA and PU) have more elongated shape than cells cultured on PS surface. Moreover, cells were arranged in parallel to each other, according to fibers orientation. In contrast, cells on PS surfaces were oriented randomly. Furthermore, in most cases, the cells proliferated better on nanofibers (PLLA and PU) than on PS surfaces modified in the same way. The results indicated that polymeric nanofibers (PLLA and PU) are better substrates for cardiac cell culture than PS surface and they enable cultivating these cells with conditions more similar to *in vivo* environment.



Biography

Ewelina Tomecka received her MSc in Biotechnology from Warsaw University of Technology in 2011. Now, she is a PhD student at Institute of Biotechnology (WUT) and a member of Chemical Sensors Research Group. Her current research interests include "Development of a microfluidic cardiac cell culture model".

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5th Global Chemistry Congress

September 04-06, 2017 | London, UK

Application of the LBET method to an analysis of single and multiple carbon dioxide and methane adsorption isotherms

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The paper presents the results of the research on the application of the LBET method with the fast multivariate identification procedure as a tool for analysing the microporous structure of carbonaceous materials on the basis of high-temperature gaseous carbon dioxide and methane adsorption isotherms. The analysis involved single, double and triple adsorption isotherms, which is a unique approach to microporous structure analysis. On the basis of the results of calculations, it can be observed that LBET method describe well the analysed adsorption systems. Also, the concurrent analysis of two and three adsorption isotherms enhanced the accuracy of the determined parameters, namely the volume of the first adsorption layer and cluster height, testifying to the effectiveness and justifiability of analysing multiple adsorption isotherms.

Biography

Miroslaw Kwiatkowski is working an assistant professor at the AGH University of Science and Technology, at the Faculty of Energy and Fuels. Main field of his interests is chemical technology, chemistry and physical chemistry, nanotechnology, material science and engineering, mathematical modelling of the adsorption process, description of the porous structure, an analysis of the influence of the production method on the formation of the porous structure of carbonaceous adsorbents, numerical analysis, computer science, energy efficiency, renewable energies, electrical energy markets and problems connected with waste management as well as economics and management. His published work includes more than 40 papers in international journals and 72 conference proceedings. He is a member of the editorial board of international journals as well as a member of the Organizing Committee many international conferences, and a regular reviewer in a reputable international scientific journals. Apart from scientific work Miroslaw Kwiatkowski also does some teaching.

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September 04-06, 2017 | London, UK

Isolation and structural elucidation of 20 hydroxyecdystone from *Vitex doniana* sweet stem bark (black plum)

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Vitex doniana sweet, a plant commonly known black plum, in English, prunier noir in French, dinya in Hausa, ucha koro in Igbo, oori-nla in Yoruba and ngarmi in Kanuri, is a medium-sized deciduous tree, 8-18 m high, with a heavy rounded crown and a clear bole up to 5 m. *V. doniana* is from Verbenaceae family and abundantly occurring in savannah regions. It can be found throughout tropical Africa. The ethanolic extract of *Vitex doniana* stem bark (11.9 g) was subjected to a silica gel accelerated column chromatography and eluent fractions (150 ml aliquots) obtained were collected and monitored with thin layer chromatography (TLC). Fractions with similar R_f values from same solvents system were pooled together. Phytochemical test of all the fractions were performed. Complete elution yielded 48 fractions (150 ml/fraction) which were pooled to 24 fractions and finally to eight fractions and coded. Fraction Vd_{8-a} (56 mg) has given a single spot a white crystal compound coded V_1 on checking with TLC and observed under Ultraviolet lamp. The R_f value was calculated to be 0.433 and melting point was found to be 241-243°C uncorrected. The infrared spectrum of compound V_1 shows prominent peaks that correspond to OHstr (3365 cm^{-1}) and C=O (1652 cm^{-1}). The ^1H NMR (400 MHz) spectrum of compound V_1 in DMSO- d_6 displayed five singlet signals. It further showed a broad singlet at δ 5.58 integrated for 1 H is due to an olefinic H-atom adjacent to the carbonyl carbon atom. Three signals at δ 3.10 (d, $J=9.0\text{ Hz}$, H-22), 3.59 (m, 1H, 2H-a) and 3.72 (m, 1H, 3H-e) each integrating for one proton is due to oxymethine protons indicating that three oxymethine H-atoms were present in the compound. The ^{13}C -NMR spectrum showed the presence of 27 carbon atoms, suggesting that may be steroid skeleton and DEPT-135 spectra showed the presence of five CH_3 , eight CH_2 , and seven CH groups, and seven quaternary C-atoms. The molecular formula was established as $\text{C}_{27}\text{H}_{44}\text{O}_7$ by HRES-MS positive ion mode m/z 481.3179. Based on the spectral analysis, the compound V_1 is thus concluded to have ecdysteroids skeleton and conclusively confirms with 2β , 3β , 14α , 20R , 22R , 25-hexahydroxy-5 β cholest-7-ene-6-one, commonly known as 20-hydroxyecdysone. This is the first time this compound was isolated from *Vitex doniana* sweet.

Biography

Mustapha A Tijjani has expertise in "Extraction, phytochemical analysis, isolation of compounds & structural identification and elucidation as well as pharmacological evaluation of compounds or extracts from plants". He has worked with many indigenous plants in North Eastern Nigeria that have analgesic, anti-inflammatory, anticonvulsant and antipyretic properties.

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5th Global Chemistry Congress

September 04-06, 2017 | London, UK

Concentration of pb and cd in soil and reed plant of busia and lugari regions of western kenya

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Heavy metals presence in the environment is of great ecological significance due to their toxicity at certain concentrations, translocation and nonbiodegradability which is responsible for their accumulation in the biosphere. Pb and Cd concentration of soil and reed plant of Busia and Lugari regions of Western Kenya was investigated with an aim of establishing the level of accumulation of the Cd and Pb metals. The level of Cd was generally high in soil samples compared to Pb. The uptake of Pb by reeds within this region is comparable, with TF of 1.4 and 0.205 for *Cyperus papyrus* and *Typha latifolia* reeds respectively.

Biography

Wangila Tsikhungu Phanice is lecturer of chemistry and Head, Physical science department, Chemistry, University of Kabianga, Kenya from 2009 upto present. Currently she is doing her Ph.D in Analytical-Environmental Chemistry from Egerton University, Kenya. Wangila Tsikhungu Phanice has obtained a Masters degree in Chemistry from Egerton University Kenya. Her research interest includes Analytical-Environmental Systems Toxicology, Food and Indigenous Knowledge Heavy and Trace Metals in Environmental Systems with a view of Analytical Chemistry.

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