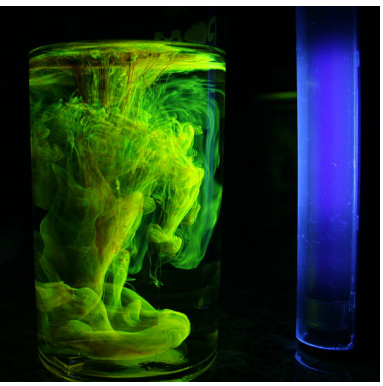
Keynote Forum
February 18, 2019

Organic Chemistry 2019
Green Chemistry 2019



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Eva Trnova, J Ind Environ Chem 2019, Volume 3
DOI: 10.4066/2591-7331-C1-007

Eva Trnova

Masaryk University, Czech Republic

Changes in chemistry education for the 21st century

Science education including chemistry is undergoing changes due to its increasing importance these days, as it faces economic and social challenges. It is possible to register these changes in most European countries as well as the USA. Society requires to prepare the younger generation for the 21st century. We need a workforce with generally higher levels of STEM (Science, Technology, Engineering and Mathematics) literacy, as well as a sufficient number of highly gifted individuals entering scientific and engineering careers. To carry out these requirements it is necessary to change way of education and to find its appropriate content. Experts are trying to define a new paradigm of science education. But in order to be successful, important curricular changes have to be accepted by all of the stakeholders in education: students, their parents, politicians and especially by teachers, who should implement these curricular changes into practice. We will present research findings of the Czech Republic concerning the identification of views on science education, what opinions on current science education are held by stakeholders and what priority should be preferred in their opinion. The appropriate content of school chemistry and innovative methods of teaching chemistry will be discussed.

Speaker Biography

Eva Trnova is senior lecturer at the Faculty of Education Masaryk University in the Czech Republic. She graduated in chemistry at the Faculty of Science, Masaryk University. She has completed her PhD in chemistry education. She has been engaged in chemistry education for a long time and she has published monographs and articles in journals about this issue. She has dealt with problems connected with curriculum for chemistry and chemistry teachers' continuous professional development (CPD) in all levels of education. She is a member of the Hands on Science and the International Council of Associations for Science Education. She has participated on organisation of several international conferences. She has been involved in many international projects dealing with research of chemistry education and the development of science education (e.g. PROFILES, Project of SFP, STAR).

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David Michael Parish, J Ind Environ Chem 2019, Volume 3
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David Michael Parish

Sherwin Williams Company, USA

Inorganic/organic hybridized polymers for use in various high performance applications

A new resin matrix has been developed that is primarily silicone based, but also has hexacrylate alkene functionality. It reacts through aerobic redox polymerization rapidly, to provide a polymer that is chemical resistant, heat resistant, flexible, and can act as a carrier for insulation materials, which performs as sprayable insulation. This resin can also act as a new NISO product, as the level of acrylate and silicone, allow for high resistance to UV degradation and is polymerized as the process indicates above. This can also be used as a precursor for emulsion polymerization. The material can be fed simultaneously with other monomers, protective colloids, initiators, etc. to create a water based silicone acrylate polymer. A patent has been filed, and is pending on this chemistry.

Speaker Biography

David Michael Parish Staff Scientist in Protective & Marine Division at Sherwin Williams Company Staff Scientist at Glatfelter, Chillicothe, Ohio with a demonstrated history of working in the chemicals industry. Strong research professional skilled in Materials Science, Microsoft Word, Paint, Polymers, Polymer Science and Sales Management. He is interested in new small molecule development, and polymer development where stronger understanding of molecular structure/property development relationship can be attained.

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Nitin Tandon, J Ind Environ Chem 2019, Volume 3
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Nitin Tandon

Lovely Professional University, India

Interactions of ceftiofur sodium with H_2 – receptor antagonist

Ceftiofur sodium is a third generation cephalosporin with broad spectrum activity against gram positive and gram negative bacteria. It is well established that the administration of cephalosporins can induce gastrointestinal complications. Therefore, it is normally advisable to co-administer the cephalosporin with some H_2-receptor antagonist to avoid such compilations. But co-administration of one drug in the presence of other may effect its performance. Therefore, the study has been carried out to check the performance of ceftiofur in the presence of H_2-receptor antagonist. Also, the study has been carried out by simulating the pH to full gut at room as well as elevated temperature.

Speaker Biography

Nitin Tandon is an Associate Professor in Lovely Professional University. He heads the Department of Research Degree Cell and Department of Curriculum Pedagogy Department. He has obtained his B.Sc. and M.Sc. from Guru Nanak Dev University and doctorate from Rajasthan University, India. His research work includes synthesis of active pharmaceutical ingredients like Vildagliptin, Apixaban, Febuxostat for which he adds many patents both Indian as well as international to his credit. He is mainly interested in design and synthesis of novel organic molecules of medicinal use.

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Runjhun Tandon, J Ind Environ Chem 2019, Volume 3
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Runjhun Tandon

Lovely Professional University, India

New polymorph of Estradiol and its stability studies

The study of polymorphism in drugs is an important part of drug development in present scenario. Infact, a detailed drug polymorph study helps to resolve problems such as drug solubility, drug formulation techniques in drug manufacturing processes. The area of drug polymorphism has received varied academic as well as industrial attention. The regulatory approvals for filing abbreviated new drug application (ANDA) and new drug application (NDA) of a particular dosage form are so strict that pharma organizations are deliberately studying polymorphs with their stability and bioavailability. The given study identifies a new polymorph of Estradiol one of the sleep awakening drugs in the market along with its characterization with pXRD, DSC and TGA and its stability data.

Speaker Biography

Runjhun Tandon is in the chemistry department of Lovely Professional University as an Associate Professor. She heads the Intellectual Property Rights Cell and take cares of the entire IPR of the university. She has obtained her graduation (B.Sc) and post graduation (M.Sc) degrees from Lucknow University and her Ph.D from Rajasthan University, India. Her research work includes synthesis of heterocyclic compounds and their polymorphic studies. Her basic inclination is towards polymorphism of active pharmaceutical ingredients for which she adds many patents both Indian as well as international to her credit. She has published many papers on metal complexation , polymorphism, and anti cancer compounds

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Hans Jurgen Federsel, J Ind Environ Chem 2019, Volume 3
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Hans Jurgen Federsel

EnginZyme, Sweden

Future of biocatalysis – Enzymatic reactions in continuous flow processes

There is a need to develop sustainable and greener processes in order to address excessive generation of waste and recent advances in the field of biocatalysis is making this possible. Biocatalysts in the form of enzymes are environmentally-friendly, biodegradable, and adaptable, enabling chemical transformations with remarkable regio- and enantioselectivities. Protein engineering has enabled the tailoring of enzymes to a required function and increased catalytic efficiency, alter substrate recognition, and even adding new structural functionality. The ability to implement these engineered biocatalysts holds promise for sustainable chemical manufacturing. However, several challenges remain a barrier against a more widespread use of biocatalysis including the cost of production of the biocatalyst itself (difficulties in capturing and re-using the enzyme), as well as the complexity of designing a manufacturing process. For this, industry is looking at immobilisation as an opportunity. Harnessing the synergy between biocatalysis and flow chemistry, immobilisation onto a solid support makes it possible to recycle the enzyme and, hence, reducing costs associated with enzyme production. Immobilisation can improve enzyme stability, prevent product contamination by the enzyme reducing downstream processing requirements, and facilitate the use of higher enzyme loadings for shorter processing times. The EziG immobilisation platform is based on polymer-coated controlled-porosity glass beads which specifically anchor any protein containing a polyhistidine (His6) tag. This platform offers a standardised solution for targeted immobilisation of enzymes on a carrier. These features of EziG enables biocatalysis to become an accessible, effective, and sustainable choice for developing greener processes.

Speaker Biography

Hans Jurgen Federsel is a PhD in Organic Chemistry, Royal Institute of Technology (KTH), Stockholm (1980). Starting as process R&D chemist in Astra, Sodertalje, Sweden (1974) he has occupied positions both as line and project manager. After the formation of AstraZeneca (1999) he became Director of Science, followed by appointment as Senior Principal Scientist. Academic qualifications led to an Associate Professorship (KTH,1990) and a seat on the Board of the School of Chemical Science and Engineering. In 2009 he was elected to the Royal Swedish Academy of Engineering Sciences. After closure of the R&D unit in Sodertalje (2012), he relocated to Macclesfield, UK maintaining his previous role. In 2017 (February) he returned to Sweden, picking up a role as Chief Scientific Officer in EnginZyme – a biotech company developing a technology platform in biocatalysis, aimed at immobilization of enzymes. Since 1st January 2019, he has taken on the position as Vice President Science Relations.

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Khalid E Al Ani, J Ind Environ Chem 2019, Volume 3
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Khalid E Al Ani

Jadara University, Jordan

Photochemical reactions in the irradiated poly (para- substituted styrene) in solid films and in solutions

In the last few years, much attention has been focused on research to prepare new generation of Poly (para – substituted styrene), and to study the irradiation, thermal and plasticization effects on stability of these new polymers. The photodegradation of irradiated solid films was studied by using UV – Visible, Fluorescence, FT - IR and TLC spectroscopic techniques. Irradiated pure and blended Poly (para – substituted styrene) solid films showed a gradual increase in the absorption intensity of the main band with the increase in the number of blended plasticizers and increase in the irradiation time as well as the formation of new bands at longer wavelengths. The fluorescence spectra of irradiated polymers in solid films and in solutions of different polarity, showed a deformation in the fluorescence main band and the appearance of new bands at longer wavelengths, indication the distraction of polymer chains and the formation of new photo products through the formation of free radical reactions. The FT – IR spectra of irradiated pure and blended solid films, showed an increase or decrease of the polymer vibration frequencies, as well as a change in numerous inferred bands intensities. The increase in the intensities of the analyzed ranges is attributed to the formation of carbonyl, hydroxyl, and aliphatic ketones and to the increase in the number of polyene structures that resulted from hydrogen abstraction during photodegradation reactions. The analysis of the Fourier-transform infrared spectra of the irradiated and nonirradiated samples showed a noticeable formation of a new broad band centred at (1,727 cm^{-1}, C=O), assigned to the growth of aliphatic ketones formerly from the reaction of reactive alkoxy radicals. Its intensity was found to increase with the increase in irradiation time and also with the increase in the amount of added Terephthalate and phthalates plasticizer, indicating an increase in the efficiency of the photo degradation process. The analysis of fragments that resulted from the photo irradiation samples of PSP in solution, using electrospray ionization-ion trap (ESI). Where the separation and determination of the fragments which resulted from degraded polymer were studied by LC– ESI-MS in positive mode and gave the best specificity and sensitivity for their detection. The positive ion (ESI-MS) spectra showed five main peaks of the total ion chromatogram (TIC). All the compounds that were resulted from the photodegradation of the irradiate polymer solution gave the protonated molecules $[M^+ H^+]$ after ionization in the electro spray source. The fragmentation ions showed the formation of monomer, dimmer and oxygenated organic compounds.

Speaker Biography

Khalid E Al Ani has completed his PhD from Southampton University, England and Postdoctoral studies from Texas University, USA. He was a Visiting Professor at Liverpool University at the Inorganic and Industrial Department, Liverpool, UK. He was a Professor at Baghdad University, Department of Physical Chemistry, Iraq. He was also a Professor of Physical Chemistry at Oran University of Science and Technology-Algeria, Hashemite University, Jordan. He was the Dean of Faculty of Pharmacy and currently the Head of the Pharmaceutical Sciences Department at Jadara University, Irbed, Jordan. He has published more than 48 original articles in international journals and attended many international conferences.

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Imeda Rubashvili, J Ind Environ Chem 2019, Volume 3
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Imeda Rubashvili

Tbilisi State University, Georgia

Development and validation of sampling procedures and quantitative determination HPLC methods of active pharmaceutical ingredient - Alprazolam residues on pharmaceutical technological equipment

The aim of this study was to validate swab and rinse sampling procedures and developed HPLC method for quantitative estimation of residues of alprazolam residues in cleaning control samples collected from pharmaceutical equipment surfaces after manufacturing of alprazolam 1 mg uncoated tablets. The swab and rinse sampling procedures were developed and qualified in order to obtain a suitable and good recovery (>90 %). The known amounts of alprazolam at three different concentration levels are spiked onto representative surfaces, which are disinfected and cleaned, then dried, sampled using swabbing and rinsing. The samples were analyzed using the validated HPLC method. For swab sampling the surface (sampling area-25cm^2) was successively wiped with one micro polyester swab (3Ч2.5Ч10mm) moistened with diluent – methanol. The influence of swab material on quantitative determination of alprazolam was checked as well.

The HPLC was developed using LC system "Ag 1260 Infinity" and Prodigy C8(2) 250 Ч 4.0mm, 5µm column with a mobile phase - a mixture of methanol, phosphate buffer pH 3.0 and acetonitrile (10 : 45 : 45 v/v); The flow rate–1.4mL/min; The detector wavelength-220nm; The injection volume–20 µL; The column temperature–300°C. The method was validated with respect to robustness, system suitability test, specificity, linearity-range, accuracy, precision (intra-day and inter day), limit of detection (LOD) and quantitation (LOQ). The solutions stability and 0.45 µm membrane filter compatibility were studied as well. These studies were performed in accordance with established ICH Q2 guideline. The calibration curve is linear (r^2=1.00000) over a wide concentration range 0.0075–10µg/mL; LOQ-0.0075µg/mL and LOD-0.005µg/mL.

The method can be applied to determine quantitatively alprazolam residues in test solutions with very low concentrations below the acceptable concentration of the cross-contamination limit.

Speaker Biography

Imeda Rubashvili has completed his PhD at the age of 28 years from Georgian Technical University and postdoctoral study from the University of Liege. He is a senior scientific researcher at Petre Melikishvili Institute of physical and Organic Chemistry of Ivane Javakhishvili Tbilisi State University, a visiting lecturer in several local universities and head of validation department of pharmaceutical company "Aversi-Rational" Ltd. He has published more than 30 scientific papers in reputed peer-reviewed journals and has been serving as an editorial board member and a reviewer. He is the member of the council of young scientists of the Georgian National Academy of Sciences.

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