inovine
Scientific Meetings

08-09
OCTOBER 2025

DUBAI, UAE

2nd World Congress on

CHEMISTRY

Venue: COPTHORNE HOTEL DUBAI
Port Saeed, Deira Dubai, UAE

Scientific Program

Day 1

Scientific Program

October 08, 2025 | Dubai, UAE

Conference Hall : Al Majlis

09:00–09:15: Registrations

09:15–09:30: Opening Ceremony

Keynote Presentations

09:30–10:10

Title: Thermal Decomposition Behaviour of Ammonium Perchlorate/LaMn0.4Fe0.6O3 Composition:An Artificial Neural Networking Investigation

Pragnesh N Dave

Sardar Patel University, India

10:10–10:50

Title: Nanotechnology Contributing to the Development of Sustainable Electrode Material(s) for the Fabrication of High Performance Aqueous Supercapacitor

Anil Kumar

Indian Institute of Technology Roorkee, India

Group Photo | Coffee Break 10:50-11:10@ Foyer

Oral Presentations

11:10–11:35

Title: Poly(diureaphosphazene)-Alginate Hydrogels as Biodegradable Fertilizer-Release Systems for Sustainable Agriculture

Navinbhai Punambhai Chikhaliya

Sardar Patel University, India

11:35–12:00

Title: Catalytic Conversion of Crude Oil to Hydrogen by a One-step Process via Steam Reforming

Mohammed A. Albuali

King Abdullah University of Science and Technology, Saudi Arabia

Session Introduction

Tracks

Organic Chemistry | Green Chemistry | Nanomaterials | Polymer Chemistry | Chemoinformatics | Analytical Chemistry | Materials Science| Chemical Engineering | Molecular Modeling | Biochemistry | Biotechnology | Agricultural Chemistry | Biotechnology | Agriculture Chemistry | Physical Chemistry

Session Chair: Pragnesh N Dave, Sardar Patel University, India

12:00–12:25	**Title: Fluorinated and Non-Fluorinated Silane-Treated Diatomaceous Earth for Water-Repellent Coatings** **Helanka Perera** Higher College of Technology, Dubai
12:25–12:50	**Title: A New Approach for Statistical Quality Control Reference Samples: Application to Quality Assessment of Sodium sulfate in 50 % Caustic Soda** **Abdallah Al-Abdallah** SABIC Manufacturing Services, KSA

Lunch Break 12:50-13:50 @Crystal Restaurant

13:50–14:15	**Title: Thermodynamic Properties of the Water/D-Sucrose/NH4H2PO4 System at 298.15 K** **El Fadel Wiam** Mohammed V University in Rabat, Faculty of Sciences, Morocco

Panel Discussion & Certificate Falicitation

Day –1 Ends

Day 2

Scientific Program

October 09, 2025 | Virtual

Virtual Mode Zoom Meeting
(GMT+4) Time in Dubai

09:00–09:20	**Title: Cr(III)-crosslinker Nanocapsules Fabricated by Double Emulsion Method for Delayed Gelation in Secondary Flooding** **Jingyang Pu** China University of Petroleum, China
09:20–09:40	**Title: Photoaligned Azodye Nanolayers: New Material for Liquid Crystal Display and Photonics Devices** **Vladimir G. Chigrinov** Hong Kong University of Science and Technology, Hong Kong
09:40–10:00	**Title: Ferrate (Vi) Technology In Water And Wastewater Treatment** **Brij Bhushan Tewari** University of Guyana, Guyana
10:00–10:20	**Title: Enhancing Salt Tolerance in Tomato Crop Using Microbial Inoculants** **Hafiza Farhat** Gomal University, Pakistan
10:20–10:40	**Title: Correct Wound Dressing To Prevent Infection** **Afraa Talal Barzanji** Ministry of Health, Saudi Arabia
10:40–11:00	**Title: Advanced oxidation processes for wastewater treatment** **Saima Farooq** University of Nizwa, Oman
11:00–11:20	**Title: Association between Metabolic Syndrome and APOA5 gene rs662799 and APOE 4(E4/E4) gene in obese patients** **Stanislav Alexandra Alina** County Emergency Hospital Giurgiu, Romania
11:20–11:40	**Title: Multiple Carious Process in a Child Suffering from Pyelonephritis- A Case Report** **Sirma Todorova Angelova** Medical University-Varna, Bulgaria
11:40–12:00	**Title: Durable Polymer/Inorganic Nanocomposite Coatings as Highly-Protective Surfaces** **Shimaa Anwer Higazy** Egyptian Petroleum Research Institute, Egypt
12:00–12:20	**Title: Yearly recurrence of pulmonary tuberculosis in Mbujimayi central prison, Democratic Republic of the Congo** **Ngoyi Kashiba Zacharie Bukonda** National Pedagogical University, Democratic Republic of Congo

12:20–12:40	**Title: Functional Characterization of Ruthenium Complexes for Catalytic Water Oxidation** **Brinda K. Narayana** Rensselaer Polytechnic Institute, USA
12:40–13:00	**Title: On Characterization Hydrodynamic of a Mixed Flow Impeller by Particle Image Velocimetry Technique** **David Israel Posadas Navarro** Universidad Nacional Autónoma de México, Mexico

Panel Discussion

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KEYNOTE PRESENTATIONS

DAY 1

Pragnesh N Dave
Department of Chemistry, Sardar Patel University, Gujarat, India

Thermal Decomposition Behaviour of Ammonium Perchlorate/$LaMn_{0.4}Fe_{0.6}O_3$ Composition: An Artificial Neural Networking Investigation

There are continuous efforts to improve the thermal decomposition of ammonium perchlorate (AP) by incorporating small amount of metal oxides. In this work, thermal decomposition of composition of AP containing 1% by mass tri-metal based perovskite oxide $LaMn_{0.4}Fe^{0.6}O_3$ have been investigated at four distinct heating rates (β=5, 10, 15, and 20° C min^{-1}). Perovskite oxide $LaMn_{0.4}Fe^{0.6}O_3$ has been synthesized via citrate sol gel method. Artificial neural networking (ANN) were trained to forecast the thermal decomposition of AP/$LaMn_{0.4}Fe^{0.6}O_3$ composition. In the present work, ANN were trained using weight % and temperature data at 5, 10, and 20°C min^{-1} heating rates to predict the weight % of the thermal decomposition of AP/ $LaMn_{0.4}Fe^{0.6}O_3$ composition at 15°C min^{-1}. Moreover, the activation energy of AP/ $LaMn_{0.4}Fe^{0.6}O_3$'s decomposition was calculated using Kissinger- Akahira- Sunose (KAS) model and the obtained values have been used to train ANN to predict the activation energy output. The R-value and MSE value were used for optimizing the effectiveness of the trained model. A similar approach was used to train the dataset for predicting the KAS activation energy (E_α). The BR (Bayesian Regularization) and LM (Levenberg-Marquardt) model showed only 0.01% and 0.04% error in overall R value for TG W% values while 0.15% and 5.79% error in the E_α values were observed. The outcome of this work can be helpful to predict the thermal decomposition behaviour of novel AP/$LaMn_{0.4}Fe^{0.6}O_3$ composition at given heating rate.

Keywords: Artificial Neural Network • perovskite oxides • Thermal Decomposition • ammonium perchlorate • Activation Energy

Biography:

Prof (Dr) Pragnesh N Dave, a distinguished figure in the field of Chemistry, presently serves as a Professor at Sardar Patel University, Vallabh Vidyanagar. With over 25 years of experience, he's held key roles including Professor & Head at K S K V Kachchh University. Prof Dave earned his Ph.D. from Sardar Patel University, specializing in Polymer Science. He's been instrumental in curriculum development, notably in Engineering Chemistry at Nirma University. Prof Dave's research focuses on nanoparticles, green technology, and wastewater treatment. A revered mentor, he has guided numerous students to academic success. Recognized globally, his contributions have earned him prestigious awards and accolades, reaffirming his dedication to scientific advancement.

Anil Kumar
Department of Chemistry, Indian Institute of Technology Roorkee, India

Nanotechnology Contributing to the Development of Sustainable Electrode Material(s) for the Fabrication of High Performance Aqueous Supercapacitor

An increasing global energy demand has driven to devise an eco-friendly and sustainable energy storage device(s) employing greener protocols to meet the requirement of cleaner energy. Nanotechnological advancements over the years have demonstrated an immense potential for the development of new materials for sustainable generation/storage of energy. For accomplishing this task, the development of 2-D carbon-based porous electrode material with large surface area is considered to be among the promising strategies. In this reference, our research is focused on developing reduced graphene oxide (rGO) of nanodimension having distinctive surface and conductive properties as energy storage materials employing biocompatible precursors. The present talk will focus on the synthesis of heteroatom(s)-doped porous rGO-based electrode material(s) following greener protocols for the fabrication of aqueous supercapacitor operating under physiological conditions. The optimized symmetric supercapacitor demonstrated superb electrochemical features of high cell voltage, fairly high areal energy density@areal power density with higher charge-discharge rate capability, and longer life-cycles. Its energy storage capability is further validated by forming a tandem device and lighting-up of LEDs. The active centres on these microstructures are explored for selective sensing. A mechanism of the occurring processes along with some current developments in this area will be discussed.

Anil Kumar and M. Khandelwal, New J. Chem., 38, 3457-3467 (2014).

S. Thareja and Anil Kumar, Energy Fuels, 36, 24, 15177-15187 (2022).

I. Ahmad and Anil Kumar, Chem. Engg. J., 477, 146972 (1-16) (2023).

I. Ahmad and Anil Kumar, Adv. Sustainable Syst. 2400174 (1-13) (2024).

Keywords: Nanotechnology, Reduced graphene oxide, Heteroatom(s)-doped, Supercapacitor, Energy storage.

Biography:

Dr. Anil Kumar completed his doctorate from Roorkee University (1977); worked as Research Associate/Guest Scientist at: ***Radiation Laboratory, USA (1979-82) and Hahn-Meitner-Institut, Germany (1986-88).*** His research on colloidal semiconductor/metal nanosystems was funded by DST/CSIR, New Delhi. At ***IIT Roorkee***, he was awarded the: ***Khosla Research Award/Silver Medal (1993-94); First Khosla Research Prize/Medal (2002–03); Star Performe***r (2003-04/2004-05) and ***G.B. Pant Institute Chair Professorship (2018)***. For his research contributions he was elected/selected/nominated by: ***The National Academy of Sciences, India as a: Fellow (2003); NASI Senior Scientist Platinum Jubilee Fellowship (2019); Fellow of Royal Society of Chemistry (2018).***

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SPEAKER PRESENTATIONS

DAY 1

Navinbhai Punambhai Chikhaliya

Assistant Professor(Selection Grade), Department of Chemistry, Sardar Patel University, Gujarat, India

Poly(diureaphosphazene)-Alginate Hydrogels as Biodegradable Fertilizer-Release Systems for Sustainable Agriculture

The growing global population continues to drive an urgent demand for increased food production, placing immense pressure on agricultural systems to enhance productivity while reducing environmental impacts. Fertilizers are indispensable for sustaining soil fertility and crop yields; however, conventional formulations are limited by low nutrient-use efficiency and are associated with soil degradation, nutrient leaching, and environmental pollution.

In this work, poly(dichlorophosphazene) (PDCP) was synthesized and subsequently transformed into poly(diureaphosphazene) (PDUP) through urea substitution. Further cross-linking with sodium alginate in the presence of calcium chloride yielded a poly(diureaphosphazene)-alginate hydrogel (PDUPAH). Both PDUP and PDUPAH demonstrated biodegradability, biocompatibility, and controlled-release fertilizer properties, highlighting their potential in sustainable agriculture. Application trials with barley seeds showed enhanced germination, improved plant growth, and increased soil hydration. Moreover, these materials improved soil water retention, nutrient availability, and structure, while reducing irrigation requirements and nutrient losses.

Overall, PDUP and PDUPAH represent promising multifunctional materials that can act as effective soil conditioners and smart delivery systems for water and nutrients, thereby promoting healthier crops and higher yields, particularly under water-limited conditions.

Keywords: Poly(diureaphosphazene), Hydrogel, Controlled-release fertilizer, Soil conditioning, Sustainable agriculture.

Biography:

Dr. Navin P. Chikhaliya is an Assistant Professor (Selection Grade) in the Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar, Gujarat, India. He obtained his M.Sc. (Industrial Polymer Chemistry) and Ph.D. in Chemistry from Sardar Patel University and has over one decades of academic and research experience. Dr. Chikhaliya's research focuses on polymer chemistry, bio-based materials, green plasticizers, flame-retardant additives, Polymer Electrolyte Membranes for the fuel cell and sustainable polymers. He has executed funded research projects supported by the Department of Science and Technology (DST-WISE), New Delhi, green plasticizers derived from Simarouba glauca seed oil for advanced polymer applications. He has published his work in reputed international journals such as the Journal of Molecular Structure, Biomass Conversion and Biorefinery, and Industrial Crops and Products etc. along with Indian patents in sustainable polymer formulations (under communication). His research contributions

bridge synthetic polymer chemistry, material characterization, and computational studies. In addition to research, Dr. Chikhaliya is actively engaged in teaching and mentoring students at postgraduate and doctoral levels. He has served in various academic and administrative roles, including Member of the Faculty of Science (Board of Studies in Industrial Chemistry) and Secretary of PGCSA (Chemistry), Sardar Patel University. He is a life member of several professional bodies, including the Society for Polymer Science (India), Society for Materials Chemistry (BARC), Indian Thermodynamic Society, and Him Science Congress Association. With a strong vision for sustainable materials research, Dr. Chikhaliya continues to contribute significantly to advancing eco-friendly polymer technologies and applications.

Mohammed A. Albualia*, Natalia Morlanesc, Alejandra Patinoa, Diego Zapaterb, Pedro Castanob, and Jorge Gascona
Multiscale Reaction Engineering, KAUST Catalysis Center (KCC), King Abdullah University of Science and Technology (KAUST), Thuwal, 23955-6900, Saudi Arabia

Catalytic Conversion of Crude Oil to Hydrogen By a One-Step Process via Steam Reforming

This work presents a multi-functional NiCoCe-based catalyst for crude oil steam reforming for hydrogen production. Arab Light (AL) and Arab Extra Light (AXL) were centrifuged to reduce the asphaltenes and sequentially steam reformed in a fixed bed reactor. Results showed that the NiCoCe catalyst was stable and highly selective under reaction conditions and in cyclic operation. The physicochemical properties of the catalyst were determined via inductively coupled plasma–optical emission spectrometry, X-ray diffraction, transmission electron microscopy, and scanning electron microscopy. The high dispersion of the NiCo alloy on a Mg–Al support was crucial for ensuring the hydrocarbon reforming in the presence of heteroatomic species.

Keywords: crude oil; hydrogen production; steam reforming; catalyst development; deactivation

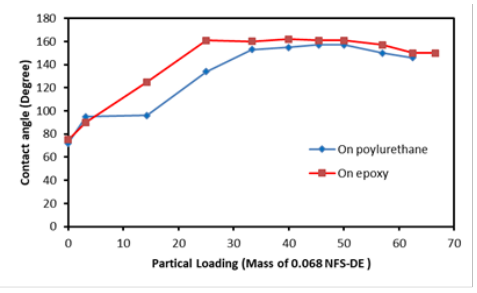
Biography:

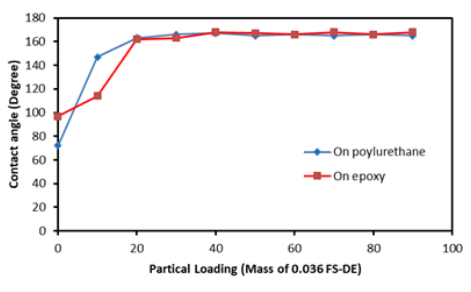
Joined Saudi Aramco in 2016 and spent one year as a process engineer in Uthmaniyah gas plant. Then, joined R&DC in 2017 as a chemical engineer researcher. Working in catalysis for reforming reactions and CO2 hydrogenations. In February 2025, got his PhD in chemical engineering from KAUST catalysis center. My PhD research was for direct conversion of crude oil to hydrogen by steam reforming. Has in total as first and co-authors 20 IPs and 5 publications. H-index of 5.

Helanka J Perera[1,2] *, Frank D Blum[2]
[1] Abu Dhabi Campus, Higher College of Technology, Abu Dhabi, UAE
[2] Oklahoma State University, Stillwater, OK, USA

Fluorinated and Non-Fluorinated Silane-Treated Diatomaceous Earth for Water-Repellent Coatings

Superhydrophobic and hydrophobic coatings were prepared by incorporating fluorinated (FS) and non-fluorinated (NFS) silane-treated diatomaceous earth (DE) into various polymeric resins/binders. The coatings were evaluated using contact angle measurements, scanning electron microscopy (SEM), and thermogravimetric analysis (TGA). Water contact angles above 150° were obtained when the DE particles were effectively functionalized with silane coupling agents and sufficient particle loading was present in the coatings. The critical particle content required to achieve superhydrophobicity varied depending on the resin/binder system. These surfaces demonstrated lotus-leaf-like characteristics, arising from the combination of low surface energy and hierarchical nano–microstructural features.





Biography:

Dr. Helanka Perera is an Assistant Professor of Chemistry at the Higher Colleges of Technology, UAE. She holds a Ph.D. in Polymer Chemistry from the United States, with expertise in eco- friendly polyurethane foams, silane-functionalized diatomaceous earth, and natural fiber composites for oil spill remediation and wastewater treatment. She has received the Abu Dhabi

Young Investigator Award from ADEK and multiple HCT-funded research grants. Dr. Perera has published in peer-reviewed journals, presented at leading international conferences, and actively mentors undergraduate researchers. She is also committed to advancing women's empowerment and gender equality through teaching and outreach.

Abdallah Al-Abdallah
SABIC Manufacturing Services – Laboratory, Jubail, KSA

A new approach for statistical quality control reference samples: Application to quality assessment of sodium sulfate in 50 % caustic soda

Sodium sulfate is a sales specification parameter in 50 % caustic soda. It has to be monitored for product transfer and sales. Part of the quality system is to assure sodium sulfate analysis is accurate. Like other test, assurance is made through conformation of equipment, method and human capability and this performed by routine analysis of quality control sample. Unfortunately, a certified reference material for sodium sulfate in 50 % caustic soda is not available due to solubility limitation.

This paper explains an innovative analytical technique for preparing and analyzing sodium sulfate reference material to assure accurate and precise analysis.

Biography:

Abdallah has completed his Bachelor degree at the age of 24 years from KFUPM University in industrial chemistry. He is the principal chemist of MGF Services cluster-1 laboratory. He has published more than 3 papers in technical conferences.

El Fadel Wiam
Mohammed V University in Rabat, Faculty of Sciences, Morocco

Thermodynamic Properties of the Water/D-Sucrose/ NH4H2PO4 System at 298.15 K

The hygrometric method is used to determine new thermodynamic data on water activity and saturated aqueous solution of the water/D-Sucrose/ Ammonium Dihydrogen Phosphate (ADP) system in a wide range of NH4H2PO4 molality, ranging from 0.1 to 3 mol.kg-1, and for various D-Sucrose contents from 0. to 4 mol. kg-1. Powder X-ray diffraction (XRD) and attenuated total reflection Fourier-transform infrared (ATR-FTIR) spectroscopy were used to characterize the solid state. The Pitzer Simonson-Clegg model (PSC) is used to fit the experimental data of osmotic coefficient obtained from water activities data. The predicted saturated aqueous solutions, with the PSC model, are in good agreement with experimental data. For the concentration inferior to 1 mol.kg-1, the negative deviation from ideality was shown with increasing the ADP concentrations. The estimated values of the activity coefficient of D-Sucrose, activity coefficient of ADP, and the Gibbs energy of transfer of ADP from water to mixture (water /D-Sucrose) show that both ADP and D-Sucrose exert significant salting-out effects on the aqueous solution.

Biography:

I am **El Fadel Wiam**. I obtained my PhD in Morocco from Mohammed V University in Rabat, Faculty of Sciences. Currently, I am a researcher at the Thermodynamic Energetic Laboratory of the same faculty. I have published more than 8 papers in reputable journals as the first author and in collaboration with other students.

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VIRTUAL ORAL PRESENTATIONS

DAY 2

Jingyang Pu
China University of Petroleum (Beijing), Beijing, China

Cr(III)-Crosslinker Nanocapsules Fabricated by Double Emulsion Method for Delayed Gelation in Secondary Flooding

The main objective of a gel treatment in most mature oil fields is to overcome challenges in the heterogeneity of the reservoir by blocking highly permeable channels or fractures without damaging productive zones. In recent decades, Cr(III)-polyacrylamide (HPAM) gels have been extensively applied as blocking agents for sweep efficiency improvement. However, the gelation time of the current gels is not long enough for in-depth placement. This study systematically describes a novel approach of using nanocapsules to entrap and delay the release of Cr(III) to extend the gelation time. The Cr(III)-entrapped nanocapsules are successfully prepared by a controlled water-in-oil-in-water double emulsion method. Hydrophobic polymers and surfactant are pre-dissolved in oil medium for the shell formation during evaporation of the oil and stabilization of the emulsion, respectively. The oil evaporation occurs at room temperature which leads to the precipitation of the polymer into the interface of the aqueous droplets. The size of the nanocapsules ranged from 175-690 nm depending on the surfactant concentration. A Cr(III) loading ratio of 0.5-6% and entrapment efficiency of 5-20% are obtained by optimizing different process variables such as Cr(III) content in the aqueous droplet, polymer content in the oil medium, and surfactant concentration. The nanocapsules coated with stabilizers can be easily dispersed in water and mixed with the HPAM solution. Gelation test results show that encapsuled Cr(III) significant delays the formation of the HPAM gel for more than 20 days which is dependent on pH and temperature.

Biography:

Jingyang Pu has completed his PhD at the age of 29 years from Missouri University of Science and Technology and postdoctoral studies from University of Texas at Austin. He is the associate professor of China University of Petroleum (Beijing). He has published more than 30 papers in reputed journals and has been serving as an reviewer board member of repute.

Vladimir G. Chigrinov
Hong Kong University of Science and Technology, Hong Kong

Photoaligned Azodye Nanolayers: New Material for Liquid Crystal Display and Photonics Devices

Photoalignment and photopatterning has been proposed and studied for a long time [1]. Light is responsible for the delivery of energy as well as phase and polarization information to materials systems. It was shown that photoalignment liquid crystals by azodye nanolayers could provide high quality alignment of molecules in a liquid crystal (LC) cell. Over the past years, a lot of improvements and variations of the photoalignment and photopatterning technology has been made for photonics applications. In particular, the application of this technology to active optical elements in optical signal processing and communications is currently a hot topic in photonics research [2]. Sensors of external electric field, pressure and water and air velocity based on liquid crystal photonics devices can be very helpful for the indicators of the climate change. One of the most important applications of photoailgned azodye nanolayers is ferroelectric liquid crystal (FLC) with a fast response time, high resolution and contrast ratio for new display and photonics devices [1-3].

We will demonstrate a physical model of photoalignment and photopatterning based on rotational diffusion in solid azodye nanolayers. We will also highlight the new applications of photoalignment and photopatterning in display and photonics such as: (i) fast high resolution LC display devices, such as field sequential color ferroelectric LCD; (ii) FLC sensors; (iii) FLC lenses; (iv) LC E-paper devices, including electrically and optically rewritable LC E-paper; (v) photo induced semiconductor quantum rods alignment for new LC display applications; (vi)100% polarizers based on photoalignment; (vii) LC smart windows based on photopatterned diffraction structures; (vii) LC antenna elements with a voltage controllable frequency.

Acknowledgements

1. V.G. Chigrinov, V.M. Kozenkov and H.S. Kwok, Photoalignment of liquid crystalline materials, Wiley, 2008.
2. V.G. Chigrinov, Liquid Crystal Photonics, Nova Science Publishers, 2015.
3. V.G. Chigrinov, Q. Guo, A. Kudreyko, A. Photo-Aligned Ferroelectric Liquid Crystal Devices with Novel Electro-Optic Characteristics. Crystals, 10, 563 (2020) , (registering DOI) org/10.3390/cryst10070563.

Biography:

Professor Vladimir G. Chigrinov is Professor of Hong Kong University of Science and Technology since 1999. He is an Expert in Flat Panel Technology in Russia, recognized by the World Technology Evaluation Centre, 1994, and SID Fellow since 2008. He is an author of 6 books, 31 reviews and book chapters, about 333 journal papers, more than 718 Conference presentations, and 121 patents and patent applications including 50 US patents in the field of liquid crystals since 1974. He got Excellent Research Award of HKUST School of Engineering in 2012. He obtained Gold Medal and The Best Award in the Invention & Innovation Awards 2014 held at the, which was hosted in Kuala Lumpur, Malaysia, on 20-22 Feb 2014. He is a Member of EU Academy of Sciences (EUAS) since July 2017. He got A Slottow Owaki Prize of SID in 2018 Since 2018 until 2020 he works as Professor in the School of Physics and Optoelectronics Engineering in Foshan University, Foshan, China. 2020-2024 Vice President of Fellow of Institute of Data Science and Artificial Intelligence (IDSAI) Since 2021 distinguished Fellow of Institute of Data Science and Artificial Intelligence. He is IETI Fellow since 2019. He is a Editor in Chief of Liquid Crystal section in Crystals journal since 2023.

Brij Bhushan Tewari

Department of Chemistry, Faculty of Natural Sciences, University of Guyana, Georgetown, Guyana

Ferrate (Vi) Technology In Water And Wastewater Treatment

Present research work determines the potential of metal ferrates for treating water and wastewater from different regions of Demerara and Berbice counties in Guyana. Chlorination is one of the methods used to treat water in Guyana, but when it comes into contact with organic material it forms carcinogenic substances also anthrax and cryptosporidium resist chlorination for this reason ferrate is analyzed as an alternative to chlorination. Metal ferrates as a treatment option is advantageous over currently used treatment method because of its oxidizing, coagulant, flocculent, disinfectant properties [1]. Potassium, barium, cesium and magnesium ferrates were synthesized and characterized by spectral studies. The tap water samples were obtained from Berbice. The surface water samples were collected from the University of Guyana pond. The wastewater samples were collected from the effluent of Banks DIH Ltd. and Bosai Mining Company in Guyana. The water quality parameters used to examine water quality pre and post treatment were turbidity, pH, alkalinity (waste hardness) chloride content, iron content, color and microbiological study of Escherichia coli and Coliform. Pre and post treatment parameters were useful to determine treatment potential of synthesized ferrates. Potassium and magnesium ferrates were found to have highest and lowest treatment potential in comparison to other ferrate studies.

Keywords: Ferrate (VI) technology, Green chemical, Water and wastewater treatment.

Biography:

Dr. Brij Bhushan Tewari is a Professor of Chemistry in the Department of Chemistry at University of Guyana. Prof. Tewari obtained his Doctor of Philosophy degree in Sciences (Chemistry) from Allahabad University and Doctor of Medicine degree from Texila American University. He has taken teaching/research appointments at several universities in Asia, Europe, USA, Canada and Guyana. His major research interests are in the area of (i) Metal complexes in biology and medicine (ii) Astrobiology & chemical evolution and origins of life (iii) Environment, Microbiology and Agriculture. He has published 141 research papers in an international journal, 01 book ,12 book chapters and 167 conferences and seminars.

Hafiza Farhat
Institute of Biological Sciences, Gomal University, 29050 D.I Khan, Pakistan

Enhancing Salt Tolerance in Tomato Crop Using Microbial Inoculants

World's largest vegetable crop tomato is of great economic importance, but its production is highly affected by salinity which devastates tomato yield. The use of plant growth promoting beneficial microbes is the most sustainable technique to alleviate salt stress. This study was carried out to investigate the impact of halotolerant endophytic Pseudomonas *(P. fluorescens 8C, P. fluorescens 7A, P. fluorescens 2B and P. fluorescens 6C)* on tomato plants under salinity (2% NaCl) stress. In vitro studies revealed that all the isolates were able to produce enzymes like invertase, gelatinase, arginase, cellulase, urease which indicates the role of enzyme production in reducing salt stress and improving productivity. All the isolates were positive for phosphate solubilization, IAA production, HCN production and gelatin liquification. In screen house experiment, the application of Pseudomonas strains helps to boost up plant immunity by showing healthy growth and also increase content of chlorophyll a, chlorophyll b, total chlorophyll, RWC%, protein, carbohydrate) as well as enzymatic activities (phenolic, catalase activity, POD activity, SOD activity) while, declined electrolyte leakage and MDA content (lipid peroxidation marker) in both saline and non-saline conditions with respect to their control treatments. Among the four isolates P. fluorescens 8C shows compatible results to P. fluorescens 7A, and P. fluorescens 2B shows compatible results to P. fluorescens6C. Application of Pseudomonas strains may be used in agriculture field in order to improve productivity even when plants are in stress condition. Pseudomonas strains act as biological strains that also play a role by producing different sorts of enzymes that reduce stress in plants.

Biography:

I Dr Hafiza Farhat did Ph.D on Antibiotic producing endophytic fungi associated with healthy plants and received Ph.D degree from university of Karachi. Now I am serving in well renowned Public Sector University (Gomal University D.I Khan) of Pakistan as an Assistant Professor. I have research articles in high impact factor journal in national and international journals. I attended so many conference and workshop as a speaker. I am also gold medalist as I achieved two gold medals in University level by getting first position in M.Sc.

Afraa Talal Barzanji
Speciality: Community medicine consultant, Organization: Ministry of Health, Saudi Arabia

Correct wound dressing to prevent infection

Aseptic technique is a standard of infection control through practices to prevent transmission of pathogens. This requires having appropriate field (zone), supplies and technique; in addition to using needed personal protective equipment. The time prior to clean and aseptic technique, is one of the five moments when hand hygiene is required by World Health Organization. The procedures which needs aseptic technique include, but is not limited to, wound dressing. To ensure adherence, monitoring is essential and training. To help in monitoring, a checklist can be used. This Poster is expected to help in making a concise checklist, with explanation of the direction of wound irrigation, because what was found in literature is mainly about mentioning dirty to clean which can lead to confusion; knowing that non-infected class I wounds are called clean.

Key words: Wound dressing, Infection control

Biography:

Dr. Afraa is a community consultant doctor. She is a holder of bachelor degree of medicine and surgery from Taibah University. Then she had her specialization through Saudi Board in community medicine in Riyadh and she was recognized as the best resident among her batch. In 2016, she became a certified professional in healthcare quality which is earned from the National association for Healthcare quality in United States. Many researches and reviews were done by her; and among the domains she is focusing on is prevention and risk factors. She is also a certified peer reviewer by Publons Academy

Saima Farooq[1],[2]*, Rongsheng Cai, James McGettrick, Emmanuel Pean, Ahmed S. Al Harrasi, Richard Palmer, Chedly Tizaouia

[1] Water and Resources Recovery Research Lab, Department of Chemical Engineering, Swansea University, Swansea, UK

[2] Department of Biological Sciences & Chemistry, College of Arts and Sciences, University of Nizwa, Nizwa, Oman

Advanced oxidation processes for wastewater treatment

Heterogeneous semiconductor photocatalysis has emerged as a promising and sustainable technology to improve water quality and directly support the achievement of Sustainable Development Goal (SDG) 6, which focuses on clean water and sanitation. Among the many pollutants of concern, steroid hormones such as estrone (E1) represent a serious threat due to their strong endocrine-disrupting potential, posing risks to both human health and aquatic ecosystems. In this study, we report the visible-light-induced photocatalytic degradation of E1 using hexagonal copper selenide (CuSe) nanoflakes. The CuSe photocatalyst was synthesized by one-pot synthesis, followed by structural and morphological characterization. The resulting nanocrystals displayed a stoichiometric Cu:Se ratio, with selenium in the Se^{2-} state and copper present in mixed +1/+2 oxidation states. Morphological analysis revealed laminar, flake-like structures with a preferred hexagonal close-packed lattice (P63/mmc). The adsorption isotherms of E1 were found to be linear, and the adsorption process was determined to be exothermic in nature. Photocatalytic experiments showed that E1 degradation followed pseudo-first-order kinetics. The rate constant (k) was influenced by several operational parameters including catalyst dose, initial E1 concentration, solution pH, and light power. Notably, CuSe was also capable of oxidizing E1 in dark conditions, accompanied by leaching of reactive species, whose identities and time-dependent behavior were investigated. Overall, the degradation of E1 was attributed to a synergistic combination of adsorption, intrinsic oxidation by CuSe, and photocatalytic activity under visible light. Liquid-mass spectrometry analysis and molecular chemistry calculations further supported the proposed degradation mechanism. These findings highlight that hexagonal CuSe nanoflakes are a highly promising material for the treatment of wastewaters contaminated with endocrine-disrupting chemicals (EDCs).

Keywords: Estrone; Emerging contaminants; Photocatalysis; Adsorption; Copper selenide

Biography:

Dr. Saima Farooq is Associate Professor and Head of the Chemistry Section at the University of Nizwa, Oman. A Physical Chemist with over a decade of teaching and research experience, she specializes in nanomaterials synthesis, photocatalysis, environmental remediation, and energy applications. She has published 40+ SCI(E) papers, 7 book chapters, with 1300+ citations and an h-index of 20. Dr. Farooq has led program design, accreditation, and digital education initiatives, while supervising PhD, MSc, and undergraduate projects. Her research focuses on green and functional catalytic nanomaterials for water purification, CO capture, energy storage, and biomedical applications.

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Association between Metabolic Syndrome and APOA5 gene rs662799 and APOE 4(E4/E4) gene in obese patients

Introduction: The APOA5 gene rs662799 is associated with metabolic syndrome, diabetes mellitus, obesity and hypertension. The APOE 4 gene with the E4/E4 isoform is associated with insulin resistance, BMI, HTN, cognitive dysfunction, Alzheimer's disease, cardiovascular disease, dyslipidemia, diabetes, obesity and inflammation. Purpose: Testing the association between the APOA5 gene rs662799 and the APOE 4 E4/E4 gene and metabolic syndrome based on clinical data, biochemical, hematological, genetic and bioinformatics laboratory investigations in obese patients. Materials and methods. Both genes were identified by RFLP-PCR, the Advanced NGx test, 75 MS subjects from the Giurgiu County Emergency Hospital were selected (55 obese patients and 20 controls) based on the following parameters: BMI, HTA, cholesterol, triglycerides, LDL, HDL, uric acid, glucose, HbA1c processed by the Graph Pad Prism 7.0.3 program and Matlab R2009b. Results:The results obtained through bioinformatics programs showed that the APOA5 gene with the rs662799 polymorphisms and APOE E4/E4 presents BMI, HTA, cholesterol, LDL, triglycerides, glucose and uric acid increased and low HDL are associated with obesity, diabetes, hypertension and metabolic syndrome, and results that it is associated with Alzheimer's disease and metabolic syndrome.Conclusions: The APOA5 gene rs662799 and the APOE E4/E4 gene are associated with metabolic syndrome and Alzheimer's disease.

Biography:

Stanislav Alexandra Alina is a medical biologist specialist at the Department of Biochemistry within the Medical Analysis Laboratory of the Emergency County Hospital Giurgiu Romania and completed her PhD at the age of 35 at the Department of Genetics, Faculty of Biology, University of Bucharest. She has studies in classical and modern methods of human genetics, biochemical and hematological laboratory investigations, clinical aspects (Metabolic syndrome, obesity, diabetes mellitus and hypertension, risk factors and bioinformatics methods, epigenetics (Alzheimer's), microbiology(Staphylococcus aureus), Immunology, Biochemistry, urinary biochemistry, Electrophoresis, Ionometry and HbA1c and Matlab programming, RFLP-PCR and Advanced NGx.

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Durable Polymer/Inorganic Nanocomposite Coatings as Highly-Protective Surfaces

A new series of polymeric nanocomposites was fabricated as an outstanding surface nanocomposite coating. The coatings' mechanical robustness and protective qualities of polymeric nanocompoites are essential objectives of this study. Many investigation techniques were used to clarify the structures, sizes, and morphologies of proposed polymeric nanocomposites and nanofillers. The created nanocomposite was filmed as a surface coating using an air-assisted spray technique. Various percentages of graphitic nanosheets were loaded into polymer resin and the produced nanocomposites were examined to investigate the structure-property relationship. The coated specimens were subjected to a salt spray test to examine their corrosion protection. Impact, T-bending, and crosscut test techniques were used to evaluate mechanical durability. The developed composites have several advantages, including elasticity, surface heterogeneity, and surface protection properties. As enchanting material, well-dispersed nanofiller distribution in the polymeric nanostructured coating offer potential surface coatings for environmentally sustainable applications.

Key Words: Polymer nanocomposite, surface coating, protective properties, mechanical robustness.

Biography:

Dr. Shimaa Anwer Higazy is a researcher at Egyptian Petroleum Research Institute, Egypt. She was awarded "Scientists for Next Generation master scholarship" for Egyptian young researchers sponsored by Academy of Scientific Research and Technology, in May 2010, and obtained her Master Degree in February 2013 from Chemistry Department of Science Faculty, Menoufiya University, Egypt. She completed her Ph.D. (2019) in Organic Chemistry, Menoufiya University, Egypt. She took part and attended domestic and worldwide events and conferences. She has authored numerous articles in high-impact, international journals. Her major researches are in Designing of eco-friendly, self-cleaning and anticorrosive surfaces for marine coating.

Jean Kakese Tshimanga, Bertin Mukuna Nyembo, Ngoyi Kashiba Zacharie Bukonda*

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Yearly Recurrence of Pulmonary Tuberculosis in Mbujimayi Central Prison, Democratic Republic of the Congo

The experience of pulmonary tuberculosis (TB) by inmates is abundantly and neatly documented in opulent countries, showing, for instance, an overwhelming rate of TB among inmates in the United States with about 4.2% of all TB cases in correctional facilities and less than 1% of the American population incarcerated at any given time. In contrast, resources-constrained countries lack such crisp metrics. Yet, reports abound, showing rampant human rights violations, high TB prevalence rate, crowdedness and poor ventilation in prisons in poor countries. "Avocats Sans Frontieres" (ASF) reports an average overcrowding rate of 720% in 4 of the main central prisons of the Democratic Republic of Congo. One of these prisons is in Mbujimayi and is the focus of this study. Objectives: We describe the prevalence, explore the correlates of TB occurrences among the inmates, and propose how to ameliorate the situation. Methods: Data for this cross-sectional study were collected from January 2019 to December 2023 on a sample of 522 inmates. We analyzed the data to determine the prevalence and factors associated with the resurgence of the disease. Results: There is a clear annual increase of TB cases from 2021 to 2022 (10.4%) and from 2022 to 2023 (8.4%). The determinants of TB occurrence of TB are: (a) single marital status (Adjusted Odd Ratio or ORa = 1.984 [1.282 - 3.070]), (b) nutritional status (ORa: 1.728 [1.051 - 2.831]), (c) place of stay (ORa: 1.584 [1.005 - 2.495]), and (d) lack of remunerative occupation (ORa: 1.887 [1.096 - 3.249]). Conclusion: The unhealthy prison environment is conducive to the spread of TB. The combination of the various associated factors makes prisons hotbeds of TB. Recommendations: To protect the health of prisoners, one would need to optimize intervention strategies notably through rigorous prevention and control policies.

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Functional Characterization of Ruthenium Complexes for Catalytic Water Oxidation

This study presents the functional characterization of a series of mononuclear Ru(II) water oxidation catalysts. We will describe the synthesis of a series of mononuclear Ru(II) complexes and in-depth electrochemical analysis to understand the redox properties of the Ru(II) complexes. We compare the electrochemical data with similar studies on other mononuclear Ru complexes in literature to highlight the role of the redox potential of the Ru(II) to Ru(III) couple in the catalytic water oxidation performance. To further evaluate catalytic performance, we measure the oxygen- evolution activity to quantify the rate of dioxygen production. By varying both the concentration of the catalyst and the reaction temperature, we systematically study the kinetics and thermodynamics of the water oxidation reaction. These experiments reveal a direct relationship between catalyst concentration and dioxygen evolution rates. Moreover, the temperature- dependence studies enable the calculation of activation energy (Ea) for the catalytic water oxidation process, providing mechanistic insights.

Keywords: water oxidation, catalysis, dioxygen, artificial photosynthesis, mononuclear Ru(II) complexes

Biography:

Dr Brinda Kadur Narayana, completed her PhD from the Centre for Nano and material sciences (CNMS), Jain University, Bangalore, INDIA in 2022. She was an Adjunct Professor of chemistry at the University of Massachusetts, Lowell, prior to joining. Prof. K. V. Lakshmi's laboratory in 2023 as a Postdoctoral Associate at Rensselaer Polytechnic Institute (RPI), Troy, NY, USA, to study the molecular mechanisms of natural and artificial photosynthetic systems.

David Israel Posadas Navarro

Universidad Nacional Autónoma de México, Departamento de Ingeniería Metalúrgica, Facultad de Química, Edifico D, Circuito de los Institutos, Ciudad Universitaria, México City, México

On Characterization Hydrodynamic of a Mixed Flow Impeller by Particle Image Velocimetry Technique

Gas-liquid agitation systems are essential in various biological applications, especially in microorganism cultures. Traditionally, the Rushton turbine impeller is used for gas-liquid mixing, but it has limitations such as dead zones and inadequate pumping capacity. To overcome these issues, a hybrid impeller called an axial-radial impeller (ARI) with four paddles was developed. This impeller combines tilted blades a 45 degrees and straight blades to generate a mixed flow. This impeller demonstrates superior performance to the traditional Rushton turbine because generates a more uniform flow through the tank.

In the present work, Particle Image Velocimetry (PIV) was used to assess the impact of the paddles' number on the local hydrodynamics of the original design of the ARI impeller (4, 5, and 6 paddles) in a cylindrical tank filled with water, rotating at 300 rpm, and with an airflow rate of 2 L/min. Results are reported in terms of vertical currents and strain rates.

Results indicated that the three ARI impellers produced significant downdrafts and updrafts. However, the four-paddle ARI generated a more uniform flow, which enhanced mixing efficiency and reduced mixing time. On the other hand, as expected, the highest string rates for all sets of impellers tested were generated near the blades. However, the ARI with 6 paddles creates a better distribution of strain rates through the tank. As a consequence of the above, the ARI with 6 paddles will have a better broke of bubbles, which implicates an improved mass transfer capacity.

In conclusion, the investigation revealed that increasing paddle count enhances the break of bubbles, and as a consequence of the above increase of mass transfer of original design, although it doesn't necessarily decrease mixing time. The ARI presents a promising alternative for fermentation processes, emphasizing the need for further optimization of its design to maximize hydrodynamic performance.

Keywords: Hybrid impeller, mixing, PIV, stirred tank, visualization flow

Biography:

David Israel Posadas Navarro completed his PhD in 2022 year from the Autonomous National University of Mexico. At the moment, is a student postdoctoral in the same university. He has published papers in Chemical Engineering journals such as Chemical Engineering and Technology, and Chemical Engineering Research and Design. He is an expert in the use of techniques for flow visualization such as Particle Image Velocimetry (PIV), and Planar Laser Induced Fluorescence (PLIF).

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