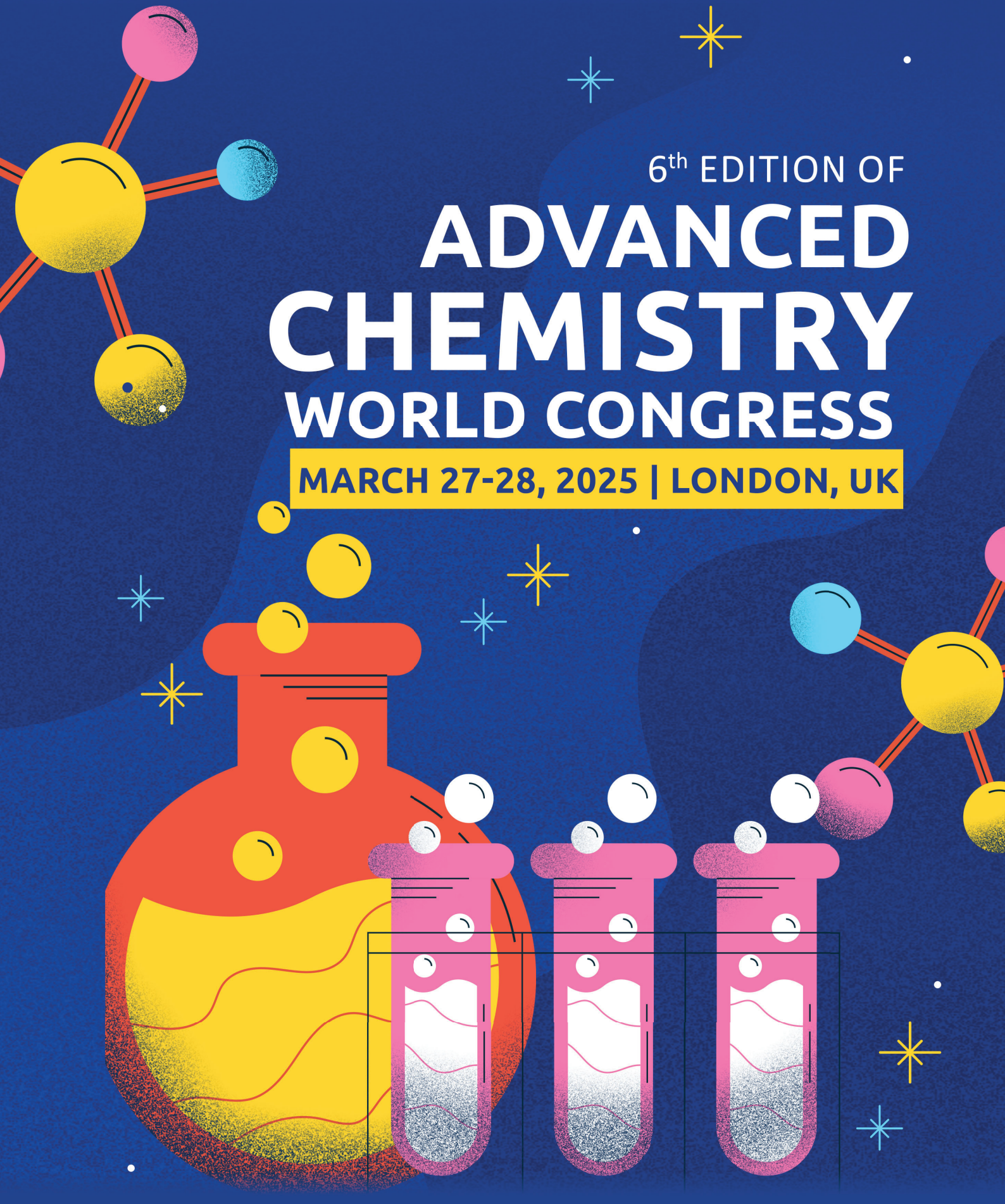
Peers Alley Media
1126 59 Ave East, V5X 1Y9, Vancouver BC, Canada
WhatsApp No: +1 506 909 0537

6th EDITION OF

ADVANCED CHEMISTRY WORLD CONGRESS

MARCH 27-28, 2025 | LONDON, UK



ADV. CHEMISTRY 2025

SCIENTIFIC PROGRAM

DAY 01
THURSDAY

MARCH 27, 2025

08:00-08:45	**Registrations**
08:45-09:00	**Inaugural Ceremony**
Moderator	**Jose Refugio Parga Torres,** *TecNM-ITS, Mexico*

Sessions: Analytical Chemistry | Industrial Chemistry | Agricultural Chemistry | Medicinal Chemistry | Chemical Engineering | Green Chemistry | Environmental Chemistry | Biochemistry | Organic Chemistry | Physical Chemistry | Geochemistry | Food Chemistry | Materials Science | Molecular Biology | Polymer Chemistry and Technology

Distinguished Speaker Talks

Session Chair	**Michael Thompson,** *University of Toronto, Canada*
09:00-09:20	Title: Nucleophilic Addition Reactions to d^9 Metal (Co, Rh, Ir) Stabilized Carbocations: Reactions of $[M(\eta^5\text{-}C_5R_5)\ (\eta^2\text{vinyl}\text{-}\eta^3\text{cyclopentenyl})]^+$ with Nu^- (OH^-, CN^-, OMe^-, CH_3^-)
	Abul Kasem Fazlur Rahman, *The University of Oklahoma, USA*
09:20-09:40	Title: Multiplexed Detection of Biomarkers for Early-Stage Ovarian Cancer
	Michael Thompson, *University of Toronto, Canada*
09:40-10:00	Title: Tobacco Smoke Condensate Induces Morphologic Changes in Human Papillomavirus-Positive Cervical Epithelial Cells Consistent with Epithelial to Mesenchymal Transition (EMT) with Activation of Receptor Tyrosine Kinases and Regulation of TGFB
	Zaniya A. Mark, *Meharry Medical College, USA*
10:00-10:20	Title: Quantitative Analysis of Thai Wetland RAMSAR Sites for Mitigating Carbon Emission and Climate Change
	Phansak Iamraksa, *Kasetsart University, Thailand*
10:20-10:40	Title: Production, Feeding and Storage of *Tetraselmis tetrathele* Paste by Electrolytic Flocculation
	Roselyn D. Usero, *Negros Prawn Producers Cooperative, Philippines*

GROUP PHOTO 10:40-10:50	
REFRESHMENT BREAK 10:50-11:10	
11:10-11:30	Title: The Nexus: Nutrients – Human Diet – Health – Physical Environment **Jan-Olof Drangert,** *Linköping University, Sweden*
11:30-11:50	Title: Antimicrobial Activity and Low *Daphnia* Toxicity of Si/PVP Hybrid Material Combined with Antibiotics **Iliana A. Ivanova,** *Sofia University "St. Kliment Ohridski", Bulgaria*
11:50-12:10	Title: Restructurable Materials for Soft Actuators **Qing Chen,** *Spallation Neutron Source Science Center, China & Institute of High Energy Physics, Chinese Academy of Science, China*
12:10-12:30	Title: Determination of PAHs in Grilled Marshmallows and their Selected Metabolites in Urine Samples **Krystyna Tyrpień-Golder,** *Medical University of Silesia, Poland*
12:30-12:50	Title: Hydrogeochemical Evolution Processes, Groundwater Quality and Non-Carcinogenic Risk Assessment of Nitrite-Enriched Groundwater to Human Health in Different Seasons in the Hawler (Erbil) and Bnaslawa Urbans, Iraq **Tawfeeq Jawhar Mohammed-Shukur,** *Van Yüzüncü Yıl University, Turkey*
GROUP PHOTO 12:50-13:00	
LUNCH BREAK 13:00-13:40	
13:40-13:55	Title: Assessment of Glycidyl Esters and 3-Monochloropropanediol Esters Contamination and Exposure Risks in Food **Wei-Ju Lee,** *Taipei Medical University, Taiwan*
13:55-14:10	Title: Development of Multiwalled Carbon Nanotube-Bacterial Cellulose Acetate Coated Polyethersulfone Membrane for Enhanced Dye Removal in a Submerged Membrane Reactor **Sukanya Karuppannan,** *Kumaraguru College of Technology, India*
14:10-14:30	Title: Challenges for Selective Catalytic Naphtha Reforming Products using Response Surface Methodology (RSM) **Rand Qusay Kadhim Al-Khafaji,** *Midland Refineries Company (MRC), Iraq*
14:30-14:50	Title: DFT Analysis of Electronic, Magnetic and Elastic Behavior in $SmMnO_3$ **Mohammed S. Abu-Jafar,** *An-Najah National University, Palestine*

14:50-15:10	Title: Sun-Powered Synthesis: Harnessing Multiwall Carbon Nanotube-EB Photocatalytic Magic in a Unified Photocatalytic-Biocatalytic System for Solar- Driven L-Glutamate Production from α-Ketoglutarate **Sunita Singh,** *University of Delhi, India*
15:10-15:30	Title: Studies of the Extraction Efficiency of Gallium in Bauxite Ore Deposits from Sefwi Awaso, Ghana, using the Bayer Process **Nafiu Mohammed Zainudeen,** *CSIR - Institute for Scientific and Technological Information, Ghana*
15:30-15:50	Title: Subchronic Toxicity Study of Herbal Tea of *Moringa Stenopetala* (Baker f.) Cudof. and *Mentha Spicata* L. Leaves Formulation in Wistar Albion Rats **Abinet Admas Alemneh,** *Saint Paul's Hospital Millennium Medical College, Ethiopia*
REFRESHMENT BREAK 15:50-16:10	
16:10-16:30	Title: Development of Methodology for the Pilot-Scale Ultrasound Treatment for the Removal of Pesticides Residues from Fresh Leeks **Eliot Botosoa,** *Artois University, France*
16:30-16:50	Title: Effect of Cathode Surface Area on the Electrodeposition Rate, Composition and Microhardness of Co–W Coatings Deposited from a Citrate Bath **Gotelyak Alexandr Vyacheslavovich,** *Shevchenko Pridnestrovie State University, Moldova*
16:50-17:10	Title: Forensic Discrimination of Blue Fountain Pen Inks Based on Dielectric Constant Property **Ozlem Simsek,** *Üsküdar University, Turkey*
17:10-17:30	Title: Biochar Synthesis using Sawdust and its Effect on Tomato Plants **Rachna Bhateria,** *Maharshi Dayanand University, India*
17:30-17:50	Title: Recent Advances in Utilization of Biochar in Wastewater Treatment **Meenakshi Nandal,** *Maharshi Dayanand University, India*
17:50-18:10	Title: A Novel Approach to Measure the Untraceable Amount of Cetirizine and Fexofenadine in Drinking Water **Yasaman Parvisi,** *Islamic Azad University, Iran*
NETWORKING	
End of Day 1	

SCIENTIFIC PROGRAM

DAY 02

FRIDAY

MARCH 28, 2025

08:55-09:00	**Introduction**

Sessions: Analytical Chemistry | Industrial Chemistry | Agricultural Chemistry | Medicinal Chemistry | Chemical Engineering | Green Chemistry | Environmental Chemistry | Biochemistry | Organic Chemistry | Physical Chemistry | Geochemistry | Food Chemistry | Materials Science | Molecular Biology | Polymer Chemistry and Technology

Distinguished Speaker Talks

Session Chair	**Jose Refugio Parga Torres,** *TecNM-ITS, Mexico*
Session Chair	**Ajay Agarwal,** *Indian Institute of Technology Jodhpur, India*
09:00-09:20	Title: Improved Technology for Production of High Quality Dore from Ores with Gold / Silver and Host Minerals with Copper and Lead **Jose Refugio Parga Torres,** *TecNM-ITS, Mexico*
09:20-09:40	Title: Nanotechnologies for Bio Chemicals Detection **Ajay Agarwal,** *Indian Institute of Technology Jodhpur, India*
09:40-10:00	Title: A Survey of Intelligent Reflecting Surfaces: Performance Analysis, Extensions, Potential Challenges and Open Research Issues **Adil Khan,** *Xi'an Eurasia University, China*
10:00-10:20	Title: Application of Dry Grinding as an Optimisation Tool for the Surface Area Development in Geopolymer Cement Manufacturing **Zvikomborero Lazarus Duri,** *Amity International University Haryana, India*
10:20-10:40	Title: Dependence of the Flowability of Fine Powders of Tool Steel on the Shape of Particles as Determined by the Method of Dynamic Image Analysis **Oleksandr Radchenko,** *Frantsevich Institute for Problems of Material Science NAS of Ukraine, Ukraine*

GROUP PHOTO 10:40-10:50

REFRESHMENT BREAK 10:50-11:10	
11:10-11:30	Title: Developments of Antibacterial Textiles: A New Horizon in Context of Hazardous Pollutant Degradation **Tanu Arefin,** *Bangladesh University of Textiles, Bangladesh*
11:30-11:50	Title: Bringing Cell Biology into Classroom: Tips to Culture and Observe Skeletal Muscle Cells in High School and College **Ryoichi Matsuda,** *Tokyo University of Science, Japan*
11:50-12:10	Title: Recent Advances on Plant-Based Acid-Base Indicators **Germildo Juvenal Muchave,** *ISCED Open University (UnISCED), Mozambique*
12:10-12:30	Title: Wiener Sausage and Particle Collision Frequency Factor **Lyakishev Vladislav Konstantinovich,** *Irkutsk State University, Russia*
12:30-12:50	Title: Two-dimensional MOF–Based Materials: Preparations and Applications as Electrodes in Li-ion Batteries **Narges Nobakht,** *Institute for Research in Fundamental Sciences (IPM), Iran*
GROUP PHOTO 12:50-13:00	
LUNCH BREAK 13:00-13:40	
13:40-14:00	Title: Novel Preparation of p-Sb_2O_3: CuO/n-Si Solar Cell: Improvement in Efficiency as a Function of Thickness **Khalid Haneen Abass,** *University of Babylon, Iraq*
14:00-14:20	Title: Photochemistry of the Retinal Chromophore in the Process of Seeing (Vision) **Ruhi Das,** *Bolpur College, Burdwan University, India*
14:20-14:50	Title: Adobe Improvement Proposal using Cassava (*Manihot Esculenta*) as a Stabilizer Applied to Luena-Moxico-Angola **Daniela Gourgel Malamba & Antonia Norman,** *Higher Polytechnic Institute of Technologies and Sciences - ISPTEC, Angola*
14:50-15:10	Title: Management Risk Factors and Associated Causes of Traffic Accidents in Arbil City, Kurdistan-Iraq **Muhsen Kamal Yasen,** *University of Kurdistan Hewler, Iraq*

15:10-15:30	Title: Evaluation of Alkaline Proteases from Rose Snapper (*Lutjanus guttatus*) to their Stability to Chemical Denaturants **Gabriela Miranda Pedroza-Toledo,** *Polytechnic University of Sinaloa (UPSIN), México*
	REFRESHMENT BREAK 15:30-15:50
15:50-16:10	Title: Nano-Emulsified Formulation of *Mentha Piperita* Essential Oil: Development, *in vitro* and *in silico* Assessment Against Diamondback Moth, *Plutella Xylostella* (L.) (Lepidoptera: Plutellidae) **Ankur,** *Dyal Singh College, University of Delhi, India*
16:10-16:30	Title: Effect of H_2S Gas Flow Rate on the Stoichiometric Ratio of S:Zn and Transparency of ZnS Nanostructure Ceramic in IR Region **Saeed Zahabi,** *Malek Ashtar University of Technology, Iran*
16:30-16:50	Title: Towards the Understanding of Precipitation Evolution in Two-Phase Steel: Application of a Novel Computational Model to Grain-Oriented Electrical Steel **Vanessa Quaranta,** *NLMK Group, Belgium*
16:50-17:10	Title: Breathing Atom **Navin Khaneja,** *IIT Bombay, India*
	NETWORKING
	End of Day 2

ADV. CHEMISTRY 2025

DAY 01

6th EDITION OF

ADVANCED CHEMISTRY WORLD CONGRESS

LONDON, UK

MARCH 27-28, 2025

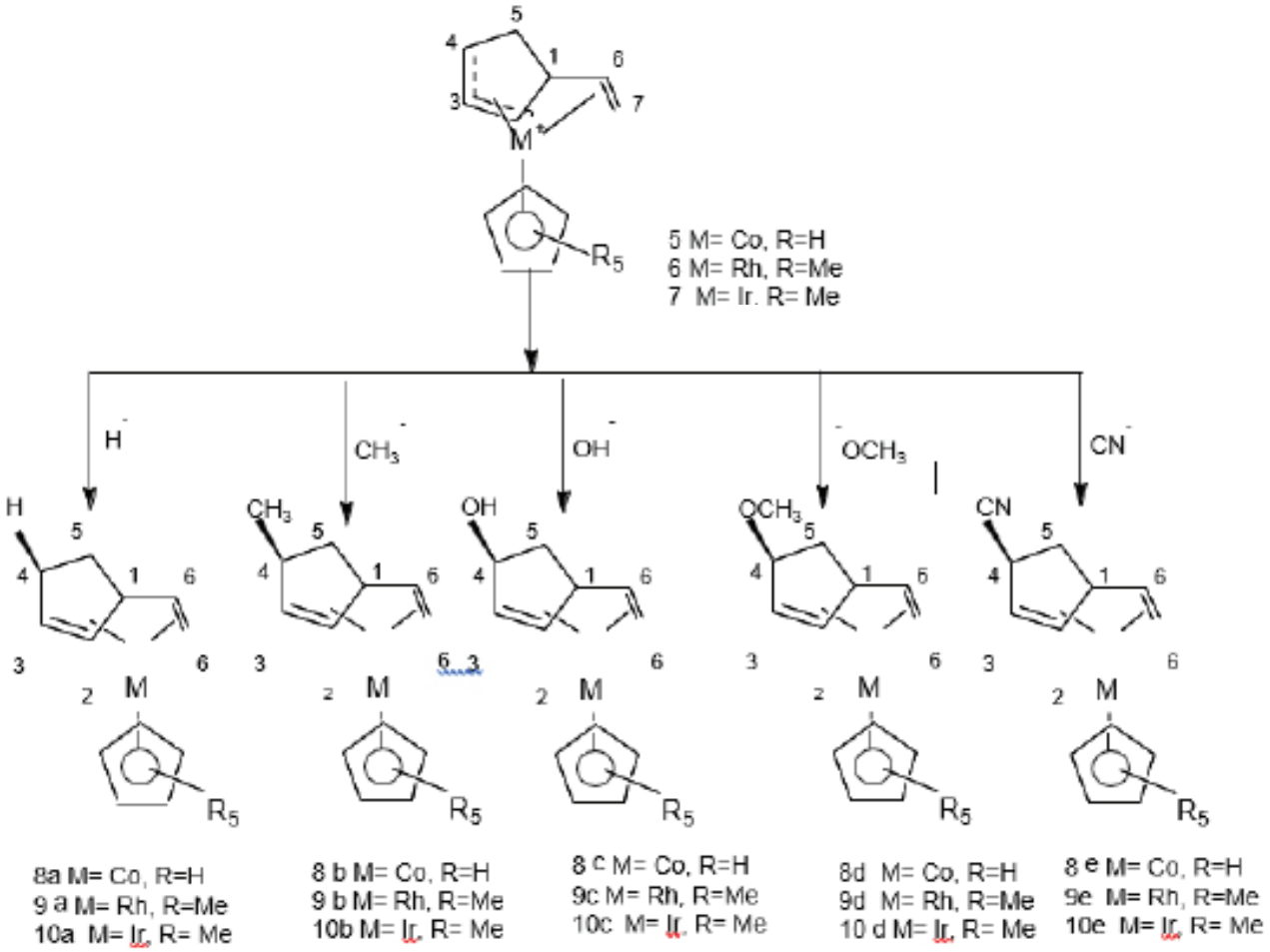
SPEAKER TALKS

Nucleophilic Addition Reactions to d^9 Metal (Co, Rh, Ir) Stabilized Carbocations: Reactions of [M(η^5-C_5R_5) (η^2vinyl -η^3cyclopentenyl)]$^+$ with Nu^- (OH^-, CN^-, OMe^-, CH_3-)

Abul Kasem Fazlur Rahman[1,2], Martin A Bennett[1], Zaheer Masood[2] and **Bin Wang[2]**

[1]Research School of Chemistry, The Australian National University Canberra, Australia
[2]Department of Chemical, Biological and Material Engineering, University of Oklahoma, USA

Nucleophilic addition reactions to metal stabilized carbo-cations, such as, [(η^5 -C_5R_5) (η^2-vinyl η^3-cyclopentenyl)]$^+$ salts with various nucleophiles such as LiAlH4, MeLi, KCN, NaOMe, exclusively yields functionalized η^2-vinyl η^2-cyclopentene complexes, as the addition products in 70-80% yield. These neutral nucleophilic addition products complexes are readily soluble in cyclohexane and ether. Nucleophilic addition reactions to cationic [(η^5 -C_5R_5) (η^2-vinyl η^3-cyclopentenyl)]$^+$ are regio-selective and preferentially attacked the η-allyl unit not the π-vinyl unit of the carbocation fragment, seemingly followed the Davis, Green, Mingos rule, with a decrease by one unit of the hapticity of the ligand for example: η^3 -allyl to η^2 -olefin. The position of hydride attack was identified by reaction with LiBD4 and the Nu^-appears exclusively to add in C4 carbon of the allylic unit with an exo attack with respect to the metal center suggesting a charge control pathway. DFT calculations were used to compare the nucleophilic reactivity of the coordinated vinyl cyclopentenyl cations coordinated to d^9 metals going from 3d Co, 4d Rh and 5d Ir. All systems prefer exo attack at C4 position of the allylic cation, where the nucleophile prefers an attack to the allylic carbocation, from the opposite site of the metal fragment to minimize steric hindrance.



Biography

Dr. Fazlur Rahman did his MA in Chemistry from Brandeis University and a Ph.D. from the Australian National University in Canberra, Australia. He did his post-doctoral works at the university of Tasmania, Australia, at the Ames National Laboratory, USA and at the University of Oklahoma, USA. Dr. Rahman is the recipient of Southwest ACS regional Award in 2009, and the Oklahoma Chemist award in 2015. Dr. Rahman held visiting faculty positions at Texas A&M, University of Rochester, Cal-Tech, UC Berkeley, Free University of Berlin and Fried Schiller University, Rutgers University and at the Columbia University in NYC. He currently holds an endowed professorship and Sharkey's Energy Foundation Chair in Chemistry at the Oklahoma School of Science and Mathematics. Rahman also worked as an affiliated Professor of Chemistry and Chemical Engineering at the with the University of Oklahoma where he teaches Organic chemistry as an adjunct Prof.

Multiplexed Detection of Biomarkers for Early-Stage Ovarian Cancer

Michael Thompson, Katharina Davoudian, Navina Lotay, Lidia Nemtsov and **Soha Ahmadi**

Department of Chemistry, University of Toronto, Canada

Ovarian cancer (OC) results in some 150,000 deaths worldwide of nearly 300,000 new cases each year. Unfortunately, only 20% of patients are diagnosed at the early stages (I and II) of the disease when treatment is most effective, leading to a 5- year relative survival rate of only 20%. Several biomarkers have been identified for OC, of which cancer antigen-125 (CA125) is the only one currently clinically approved. However, the use of the CA125'assay is limited to high-risk women, and it is often performed with a transvaginal ultrasound. Although CA125 is elevated in over 90% of late-stage OC cases, it is elevated in only 50 % of early-stage cases and can yield false-positive and false-negative results. A highly attractive possibility with regard to biomarker detection would be the incorporation of a biosensor format.

Lysophosphatidic acid (LPA) is a distinctly attractive potential biomarker for OC with high sensitivity (98 %) and specificity. The normal level of LPA in the body is 0–5 μM, but increases to 5–50 μM in OC, even in stage I. In our research, we are employing three different biosensor-based strategies for LPA detection in tandem with that for CA-125. These techniques include an ultra-high frequency acoustic wave device, a chemiluminescence-based iron oxide nanoparticle (IONP) approach and electrochemical detection based on both square wave and differential pulse voltammetry. For assay of LPA all these methods incorporate the protein complex gelsolin-actin, which enables testing for detection of the biomarker binding to the complex results in separation of gelsolin from actin. In proof-of-concept experiments, each of the approaches is capable of the detection of LPA at the sub micromole level. In addition to the work with LPA we are developing an electrochemical system for the tandem assay of CA-125 which is based on an aptamer probe for the marker.

Biography

Prof. Michael Thompson obtained his PhD in analytical chemistry from Mc Master University. He was Lecturer in Instrumental Analysis at Loughborough University, UK before moving to the University of Toronto where he is now Professor of Bioanalytical Chemistry. His research is centered on the surface chemistry of fouling by biological species and biosensor technology. Thompson has served on the Editorial Boards of a number of major international journals and is Editor-in-Chief of “Detection Science” for the Royal Society of Chemistry, UK. He has been awarded many prestigious international prizes for his research including The Robert Boyle Gold Medal of the Royal Society of Chemistry, The Elsevier Prize in Biosensor and Bioelectronics Technology and the E. W. R. Steacie Award of the Chemical Society of Canada. In 2023, with colleagues from Europe, he was awarded the prestigious Royal Society of Chemistry Horizons Prize. He has published over 300 papers.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Tobacco Smoke Condensate Induces Morphologic Changes in Human Papillomavirus-Positive Cervical Epithelial Cells Consistent with Epithelial to Mesenchymal Transition (EMT) with Activation of Receptor Tyrosine Kinases and Regulation of TGFB

Zaniya A Mark[1,2], Linda Yu[2], Lysandra Castro[2], Xiaohua Gao[2], Noelle R Rodriguez[2], Deloris Sutton[3], Erica Scappini[4], Charles J Tucker[4], Rob Wine[4], Yitang Yan[2], Evangeline Motley[5] and **Darlene Dixon[2]**

[1]Department of Biochemistry, Meharry Medical College, USA
[2]Mechanistic Toxicology Branch, National Institute of Environmental Health Sciences, USA
[3]Comparative and Molecular Pathogenesis Branch, National Institute of Environmental Health Sciences, USA
[4]Signal Transduction Laboratory, National Institute of Environmental Health Sciences, USA
[5]Department of Microbiology, Immunology, Physiology, Meharry Medical College, USA

High-risk human papillomavirus (HR-HPV; HPV-16) and cigarette smoking are associated with cervical cancer (CC); however, the underlying mechanism(s) remain unclear. Additionally, the carcinogenic components of tobacco have been found in the cervical mucus of women smokers. Here, we determined the effects of cigarette smoke condensate (CSC; 3R4F) on human ectocervical cells (HPV-16 Ect/E6E7) exposed to CSC at various concentrations (10^{-6}-100 µg/mL). We found CSC (10^{-3} or 10 µg/mL)-induced proliferation, enhanced migration, and histologic and electron microscopic changes consistent with EMT in ectocervical cells with a significant reduction in E-cadherin and an increase in the vimentin expression compared to controls at 72 h. There was increased phosphorylation of receptor tyrosine kinases (RTKs), including Eph receptors, FGFR, PDGFRA/B, and DDR2, with downstream Ras/MAPK/ERK1/2 activation and upregulation of common EMT-related genes, *TGFB SNAI2, PDGFRB,* and *SMAD2*. Our study demonstrated that CSC induces EMT in ectocervical cells with the upregulation of EMT-related genes, expression of protein biomarkers, and activation of RTKs that regulate *TGFB* expression, and other EMT-related genes. Understanding the molecular pathways and environmental factors that initiate EMT in ectocervical cells will help delineate molecular targets for intervention and define the role of EMT in the initiation and progression of cervical intraepithelial neoplasia and CC.

Biography

Zaniya A. Mark was born and raised in Greensboro, NC. She attended Fayetteville State University (FSU), where she graduated with a Bachelor of Science in Chemistry. Zaniya Mark was accepted into Meharry Medical College (MMC) Biomedical Science Program to pursue a Doctor of Philosophy (Ph.D.). While obtaining her Ph.D., she joined the Biochemistry, Cancer Biology, Neuroscience & Pharmacology Department at MMC where she participated in real-world research-intensive projects highlighting the biological, functional and molecular effects of genes impacting human diseases including cancer producing numerous first author and co-author manuscripts. She landed a full-time fellowship position to conduct her dissertation work and increase her understanding and knowledge for biomedical research, at the NIEHS/NIH. She has won numerous awards at national conferences based on her research proposals and thesis work. She became a pioneer by becoming the first graduate ambassador to bridge the gap and create collaborations between NIEHS/NIH and HBCU's.

Quantitative Analysis of Thai Wetland RAMSAR Sites for Mitigating Carbon Emission and Climate Change

Phansak Iamraksa, Sarinya Sanitwong na Ayutthaya and **Htet Khaing Kyi Lin**

Faculty of International Maritime Studies, Kasetsart University, Thailand

Vigorously changing of several environmental problems have occurred more often in the last two years. Unpredictable severed flood in many terrains destroy large areas of human and natural habitat. In Thailand where is located near the equator, there are numerous reports regarding the death of marine life found in different coastal lands of the country. These are evidence of climate change and carbon emission impact on human civilization, and they seem to occur more frequent and different forms; therefore, reducing carbon emission can effectively solve this threat in the root course instead of heavily investment in infrastructure to ease such menace.

Wetland attributes huge potential to alleviate the climate change and carbon emission problem. This natural flooded area serves many species including land animal, marine life, and plant life, encouraging biodiversity. Additionally, this natural terrain spreads out from inland to coastal areas of the country. Humans also develop their own wetland as well. The RAMSAR site criteria provide obvious insight information of the area where indicate how importance of the site not only for ecological conservation but also mitigating climate change and carbon emission.

The quantitative method was applied to SWOT and Analytical Hierarchy Process (AHP) analysis in this study. Each parameter, concerning carbon neutrality, of the site including strengths, weaknesses, opportunities, and threats were studied and represented as quantity of the significant level. The pair of weakness and strength was considered as propose and counter-propose as well as the pair of threat and opportunity. The AHP analysis was performed in each mitigation derived from SWOT analysis prioritizing the mitigation policy which needed to be realized before and so on. This study will serve as a guideline for local authority and policy maker to design the mitigation handling the

climate change by utilizing the benefit of RAMSAR site in their area.

Biography

Assist. Prof. PHANSAK IAMRAKSA is a lecturer of the Faculty of International Maritime Studies, Kasetsart University, Sriracha campus, Thailand. He teaches several subjects concerning the navigation science and marine engineering including Marine Navigation Electronic, Fundamental of Marine Compass, Ship Electrical System and Shipboard Electrical Machine.

He finished his Ph.D. in Electronic and Electrical Engineering from the University of Southampton, United Kingdom and used to join the National Nanotechnology of Thailand as a researcher in organic electronic and fabrication research unit. Now, he is pursuing many research topics such as Autonomous/Remote Navigation technology, Electrical Drive Conversion and Next generation augmented training.

Production, Feeding and Storage of *Tetraselmis tetrathele* Paste by Electrolytic Flocculation

Roselyn C. Usero[3], Annie U. Villa-Franco[1], Christine Marie L. Teves[1], Knessa Louie G. Dato-on[1], Evelyn Grace D. J. Ayson[1,2] and **Milagros R. de la Peña[1]**

[1]Southeast Asian Fisheries Development Center, Philippines
[2]Central Philippines University, Philippines
[3]Negros Prawn Producers Cooperative, Philippines

An innovative microalgae harvesting technique using electro flocculation was carried out at different voltage treatments (4, 7, and 9 V) using a fabricated voltage regulator and compared with harvesting by electro flocculation at 12 V using a car battery to efficiently electro flocculate *Tetraselmis tetrathele*. This study was conducted to determine the ideal voltage settings that could improve the quality of harvested paste in terms of nutritional value and metal contamination for its later use in aqua- culture. The use of 7 V achieved low Pb content producing the best harvest biomass (1.4 kg, 87 min) which is comparable to the harvest biomass (1.7 kg, 68 min) using a 12 V car battery. Storage of *T. tetrathele* paste is best done in a chiller (2 ± 1 °C) rather than a freezer (-20±-4 °C) for ease in reactivation and maintaining higher cell viability for later use as a starter in aquaculture. Storage in a chiller allows *T. tetrathele* paste to be resuspended after six months and used as a starter culture.

Biography

A dedicated chemist with a Master's in Environmental Engineering, Roselyn Usero plays an important role in advancing scientific practices. As the leader of an ISO/IEC 17025:2017 accredited environmental laboratory, she strives to set high standards for laboratory services.

Her commitment to excellence has been recognized with the 2018 Chemical Industries Award from the Philippine Federation of Chemical Societies and the 2019 Outstanding Chemist of the Philippines award from the Professional Regulation Commission. She actively fosters innovation in the Philippine Shrimp Industry, earning accolades at the Philippine Shrimp Congresses for her work on successful culture techniques.

In addition to her laboratory leadership, she serves as an Associate Professor in the Chemistry Program at the Technological University of the Philippines-Visayas and contributes to the Industry Advisory Council. Her evaluative work with the Department of Science and Technology's Small Enterprise Technology Upgrading Program further reflects her dedication to enhancing agricultural productivity.

The Nexus: Nutrients – Human Diet – Health – Physical Environment

Jan-Olof Drangert

Linköping University, Sweden

Improved global data allows for a new understanding of the impact of what food we produce, eat and dispose of for the environment, human health and Nature's resources. The rapid population growth and urbanization make clear cities pivotal impact on urban as well as all agricultural areas in this century. Today, it is not famine that worries urban residents, but the food sector's contribution to climate change, biodiversity loss and harmful chemicals as well as poor human health. Therefore, their food demand rather than farmers, fishermen or loggers will be guiding remedial measures to be taken by individuals, industry and the public sector. Some 17 million people die each year due to poor diets, more than double the 7 million deaths since the onset of the COVID-19 pandemic. A return to more plant-based diets with unchanged intake of proteins and less calories, sugar, salt and fat combined with less red meat and ultra-processed food would reduce foremost non-communicable diseases and prolong life. Eating less meat-based diets and more soilless food, as well as reducing food waste and recycling urban-disposed nutrient as fertilizers could reduce agriculture's land use by 50 to 70 per cent while still securing a healthy food supply. Thus, we could avoid the current clearing of new fields needed under a business-as-usual regime. Less land under cultivation and pasture would allow Nature to reclaim more areas in order to catch carbon and rejuvenate biodiversity. Smart cities fitted with infrastructures to recycle macro- and micro- nutrients and organic matter will also ameliorate human-induced impacts such as emissions to air and water bodies, reverse crossing other planetary boundaries, and reduce polluting extraction of N, P and K. Rapid results are within reach since dietary change and the turn-around time of nutrients in food is very short: months rather than decades or centuries as for recycled materials in cars or buildings.

Biography

Dr. Jan-Olof Drangert is an Assoc. Prof. at Linköping University. His area of studies started with water issues in rural areas, then to urban sanitation challenges, and presently global environmental impacts of food systems. He has published more than 50 articles in reputed journals and has been serving as Guest Editor to several publications.

Antimicrobial Activity and Low *Daphnia* Toxicity of Si/PVP Hybrid Material Combined with Antibiotics

Iliana A. Ivanova[1], Lilia Yordanova[1], Yoanna Kostova[2], Elica Pavlova[3], Elena Nenova[1], Vasilena Stoichkova[1] and **Albena Bachvarova-Nedelcheva[4]**

[1]Faculty of Biology, Sofia University "St. Kliment Ohridski", Bulgaria
[2]Institute of Metal Science, Equipment and Technologies with Hydro and Aerodynamics Centre "Acad. A. Balevski", Bulgaria
[3]Faculty of Physics, Sofia University "St. Kliment Ohridski", Bulgaria
[4]Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Bulgaria

Silica has been approved by the FDA agency as Generally Recognized as safe, due to its marked biocompatibility, inertness, low toxicity, resistance to acidic conditions and temperature. The main route of silicon nanoparticles entry into the cell is through endocytosis. It can be phagocytosis, pinocytosis, clathrin-dependent, caveolae-mediated and clathrin-caveola-independent route. The activation of cell necrosis or apoptosis depends on the size of the particles. For silica nanomaterials around 20 nm in size, toxicity levels are high, but nanoparticles between 30-50 nm did not activate such processes. Silica nanoparticles with a size of 50 nm cause a stronger and longer-lasting negative effect on calcium metabolism, which is followed by apoptosis, compared to particles of 200 nm. Silica particles with a size greater than 135 nm do not exhibit cytotoxicity, which defines them as promising drug carriers.

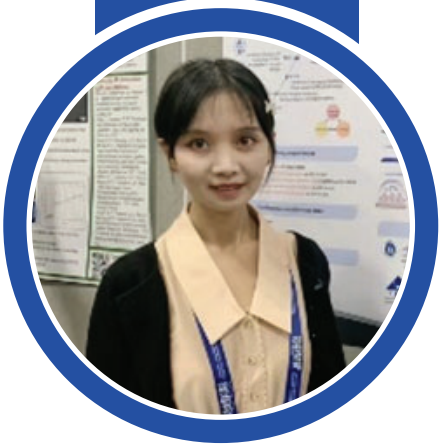
In the present study antimicrobial activity of Si-15PVP hybrid material on Gram-positive, Gram-negative bacteria and yeasts *Candida albicans* and *Saccharomyces cerevisiae* in combination with antibiotics: Vancomycin for Gram-positive bacteria, Ciprofloxacin for Gram-negative bacteria and Nystatin for yeast has been tested. The results confirm a concentration dependent synergistic effect of the antibiotic in combination with the TM15-PVP hybrid particles, especially at their highest concentration of 100 mg/mL on Gram-positive and for the Gram-negative bacteria. On *Candida albicans* and *Saccharomyces cerevisiae* effect is synergistic again and fungicidal effect was observed at 6.25 and

1.50 mg/mL for the antibiotic concentration and concentrations of hybrid material at 100 mg/mL. The prooxidant and antioxidant activity, as well the toxicity on *Daphnia magna* was tested. The toxicity on *Daphnia magna* in acute tests was not detected at concentration of 0.01 mg/mL.

The obtained results demonstrate the possibility of clinical application of new synthesized hybrid material.

Biography

Iliana Ivanova graduated from medical college and worked for two years as a pharmacist in Stara Zagora. She then completed a master's degree in molecular and functional biology at Sofia University, Bulgaria. After two years at the Institute of Genetics and one year at the Department of Plant Physiology at the Faculty of Biology, she defended her doctoral degree at the Department of Microbiology on the topic "Microflora of the Tyulenovo oil field and opportunities for its application". She worked for 3 years as a biotechnologist in an oil and gas exploration and production company before starting as an assistant professor at Sofia University. For the past 15 years, Ivanova has been working on nanostructured thin films and nanocomposites of metals, metal oxides, graphene and zeolites and tested their antimicrobial activity. She is interested in green synthesis of nanomaterials and this is her latest project.



Restructurable Materials for Soft Actuators

Qing Chen[1,2]

[1]Spallation Neutron Source Science Center, China
[2]Institute of High Energy Physics, Chinese Academy of Science, China

Soft actuators are widely employed in the fabrication of soft robotics and human–machine interfaces. Being assembled from materials which are responsive to environmental stimuli, the state-of-the-art soft actuators not only perform robotic tasks, but also exhibit a long service life. Although meeting these requirements could be a challenge for traditional actuators, restructurable materials could be a solution to it, since both the actuation and healing functions rely on the stimuli-responsive structural rearrangement of these materials. In this work, we employed the technique of layer-by-layer assembly to combine a hygro-restructurable and a thermal-restructurable materials which are composed of neither the same polymer matrix nor of the similar chemical crosslinking. The double-layered actuator is responsive to four types of stimuli, and could be repaired by the sequential treatment of heating and humidifying. This represents a promising strategy of assembling reprogrammable soft actuators by laminating materials of distinct chemical sources without sacrificing their stimuli-responsiveness through the manufacturing procedure.

Biography

Dr. Qing Chen is currently employed as an associate professor at the China Spallation Neutron Source (Chinese Academy of Sciences). She was employed at Photon Science Department, Deustches Electronen-Synchrotron as a postdoc from 2019 to 2022, and a scientist at the High-Performance Ceramics Laboratory, Swiss Federal Laboratory of Material Science and Technology from 2022 to 2024, respectively. Her work is focused on using synchrotron techniques to decipher the nano- and micro-structures of soft materials, including colloids, biopolymers, and stimuli-responsive polymers, for correlating the structure-function relationships of smart devices, such as stimuli-responsive actuators, wearable sensors, and human-machine interfaces. In the past 6 years, Dr. Chen has published 19 peer-reviewered articles, including three articles as the first-author in the journal of Advanced Functional Materials. Dr. Chen had delivered an invited talk in Seattle at the MRS 2024 Spring meeting, and is nominated as one of the “Distinguished Invited Speaker” in the Symposium of “Biomimetic and bio-based materials for soft robotics”. Besides, she is also one of the reviewer boards in journals including ACS Applied Material & Interfaces, ACS Applied Nano Materials, and Soft Science.

Determination of PAHs in Grilled Marshmallows and their Selected Metabolites in Urine Samples

Krystyna Tyrpień-Golder[1], Maciej Maciejczyk[1], Beata Janoszka[1], Magdalena Szumska[1], Aleksandra Damasiewicz-Bodzek[1], Agnieszka Nowak[1], Beata Pastuszka[2] and **Sławomir Waligóra[1]**

[1]Department of Chemistry, Medical University of Silesia, Poland
[2]Silesia LabMed Research and Implementation Centre, Medical University of Silesia, Poland

Objective: Grilling marshmallows is a favorite activity for children and young people. Marshmallows are also available in many supermarkets ready to be grilled. As such, grilled marshmallows can be a source of exposure to carcinogenic polycyclic aromatic hydrocarbons (PAHs). That is why hydroxy-PAH concentrations in the urine of volunteers before and after eating grilled marshmallows, as biomarkers of exposure to PAHs, has been determined.

Scope: The surveys were performed among 300 children and adolescents regarding the consumption of grilled marshmallows. PAH8 (recommended for the determination in food) were analyzed in “raw” and grilled marshmallows. 1-hydroxypyrene and 9-hydroxyphenanthrene were determined in urine of volunteers who ate grilled marshmallows.

Methods Used: The analysis of PAHs in grilled marshmallows included a dilution step, liquid-liquid extraction with cyclohexane and solid phase extraction (SPE columns with silica gel). PAHs fractions were initially analyzed by planar chromatography (HPTLC) and Fourier-transform infrared spectroscopy (FTIR). PAH concentrations were determined by gas chromatography-tandem mass spectrometry (GC-MS/MS) with selected reaction monitoring (SRM). Hydroxy-PAHs were analyzed in urine, after enzymatic hydrolysis, using the high-performance liquid chromatography with fluorescence detection (HPLC/FLD).

Results: The results of HPTLC, FTIR and GC-MS/MS analyzes indicate that "raw" marshmallows do not contain PAHs. However, survey suggest a lack of awareness of the risks of carcinogenic PAHs from grilled marshmallows, whose presence was confirmed by chromatographic techniques. Higher concentrations of PAHs were determined in multicolored

marshmallows compared to white ones. Moreover, statistically significant differences were found between the concentrations of selected hydroxy-PAHs in urine samples before and after eating grilled marshmallows.

Conclusion: The vast majority of respondents' parents allow their children to grill marshmallows, which proves their insufficient knowledge about the harmful substances they contain. High correlation coefficients indicate the co-occurrence of these most carcinogenic PAHs in grilled marshmallows to which children are exposed.

Biography

Krystyna Tyrpień-Golder is an analytical chemist and teacher of medical students. Prof. at the Department of Chemistry, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice (Poland). Her research includes assessing the exposure of patients with various diseases and children to environmental pollutants and searching for methods for determining their biomarkers in biological material.

She has authored 280 papers including original researches, books and book chapters, and conference reports. Several doctoral theses were written under her supervision. She received many awards, including: Award of the Polish Minister of Health for a series of publications on the development and application of a methodology for determining biomarkers in urine to assess exposure to tobacco smoke and Medal of the National Education Commission. Since 2000, she has been a member of the Chromatographic Analysis and Related Techniques Committee of the Polish Academy of Sciences and a member of the Polish Society of Toxicology.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Hydrogeochemical Evolution Processes, Groundwater Quality and Non-Carcinogenic Risk Assessment of Nitrite-Enriched Groundwater to Human Health in Different Seasons in the Hawler (Erbil) and Bnaslawa Urbans, Iraq

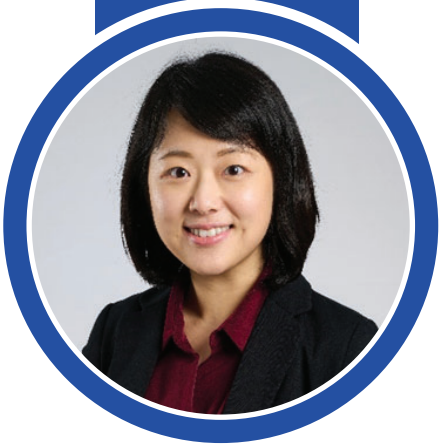
Jawhar Mohamaed Shukur Tawfeeq[1], Erkan Dişli[2] and **Masoud Hussein Hamed[3]**

[1]Department of Environmental Engineering, Van Yüzüncü Yıl University, Turkey
[2]Department of Geology, University of Salahaddin, Iraq

The main objectives of this research are to assess groundwater, a primary source of drinking water in the urban areas of Hawler (Erbil) and Bnaslawa in northern Iraq, and the non-carcinogenic human health risks of nitrate contamination associated with drinking water quality. For this purpose, twenty-seven groundwater samples were collected from wells to assess the hydrogeochemical characteristics and groundwater quality for both natural and anthropogenic purposes during the wet (May 2020) and dry (September 2020) seasons. During the wet and dry seasons, NO^{3-} in groundwater ranged from 14.00 to 61.00 mg/L and 12.00 to 60.00 mg/L, with an average value of 35.70 and 29.00 mg/L, respectively. Approximately 25.92% of the samples exceeded the permissible limit of the WHO (2011) drinking water standard. The ratios of NO_3-/Na^+ vs. Cl^-/Na^+ and SO_4^{2-}/Na^+ vs. NO_3-/Na^+ indicate the effect of agricultural activities and wastewater leaking from cesspools or septic tanks on the quality of groundwater during the wet and dry seasons. The EWQI method ranked 62.5% and 75% of the urban groundwater as not recommended for drinking and the remaining samples are moderately suitable in both wet and dry seasons. The non-carcinogenic human health risk assessment displayed that during the wet and dry seasons, 29.6% and 25.9% of adults, 48% and 30% of children, and 48.1% and 29.6% of infants were exposed to increased concentrations of nitrate in groundwater. Due to high nitrate in drinking water, non-carcinogenic human health risk levels vary as infant>child>adults.

Biography

Jawhar Mohamaed Shukur Tawfeeq works as Hydrogeological researcher since 2019 in Van Yuzun Cu Yill University, Department of Environmental Engineering, Turkey. He also works, as a Hydro geologist Expert in GDWS /KRI/Iraq Since 2010. He presented his researches in Germany in Berlin Free University during international conference (GeoBerlin2023) and in the University of Sulaymania, Iraq during (GeoKurdistan2022). Master degree in Hydrogeology in Van Yuzun Cu Yill University, Department of Environmental Engineering, Turkey, 2021. He is working now with water and sanitation group with UN agency in Erbil, Iraq as a Hydro geologist expert.



Assessment of Glycidyl Esters and 3-Monochloropropanediol Esters Contamination and Exposure Risks in Food

Wei-Ju Lee

School of Food Safety, College of Nutrition, Taipei Medical University, Taiwan

Glycidyl esters (GEs) and 3-monochloropropanediol esters (3-MCPDEs) are contaminants formed during high-temperature oil processing. Once ingested, they are metabolized into compounds identified by the International Agency for Research on Cancer (IARC) as potentially carcinogenic—glycidol and 3-MCPD. Our research evaluated contamination levels and health risks of GEs and 3-MCPDEs in edible oils, processed foods, infant formula, and brined meat in Taiwan. Our findings showed that whereas refined oils often exhibited elevated contaminant contents owing to processing, certain unrefined oils demonstrated detectable contamination levels because of high-temperature treatments like roasting. Analysis of processed foods showed processed oils like margarine had the highest contaminant contents, followed by cookies and spreads, due to refined oils being used extensively in food products. Moreover, palm oil-containing products, such as processed oils, baked goods, and instant noodles, had particularly high 3-MCPDE and GE contents, indicating palm oil was a key contamination source. Risk assessments indicated elevated GE exposure in cookies and baked goods, posing risks for children due to their lower body weight. For Taiwanese infants, exposure to GEs was within safe limits, while high intakes of 3-MCPDEs among consumers surpassed the tolerable daily intake, indicating a potential health risk. In cooked and cured meats, pork showed the highest 3-MCPDE contents, followed by salmon, beef, and chicken. Higher NaCl contents increased 3-MCPDE contents and oxidative degrees, indicating that salt and unsaturated fats promote lipid oxidation. These results indicate the widespread presence of GEs and 3-MCPDEs in food, along with potential risks, which require ongoing monitoring and attention.

Biography

Dr. Wei-Lu Lee, Associate Prof. in the School of Food Safety at Taipei Medical University, holds a Ph.D. in Agricultural Chemistry from National Taiwan University. She has published over 20 research papers, with a focus on edible oils and food safety. Dr. Lee's work investigates processing contaminants, such as glycidyl esters (GEs) and 3-monochloropropane-1,2-diol esters (3-MCPDEs), and research issues of oil adulteration and oxidative stability in oil-containing foods. In addition to her research, Dr. Lee is a lecturer on regulatory education for auditors of certification authorities at TFDA. She possessed Soybean Oil Master Certification (USSEC) and Level 1 Olive Oil Taster Certification (OLEA), highlighting her expertise in edible oils. Her contributions advance the understanding of oil contamination and oxidation to ensure food safety and quality in oils and oil-derived products.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Development of Multiwalled Carbon Nanotube-Bacterial Cellulose Acetate Coated Polyethersulfone Membrane for Enhanced Dye Removal in a Submerged Membrane Reactor

Sukanya Karuppannan[1], Sivarajasekar. N[1] and **Saranya Karuppannan[2]**

[1]Department of Biotechnology, Kumaraguru College of Technology, India
[2]Department of Electrical and Electronics Engineering, Kalaignarkarunanidhi Institute of Technology, India

Water scarcity is a pressing global issue due to technological advancements leading to increased water demand and wastewater generation from various industries. This underscores the significant concern for developing cost-effective technologies for enhancing water resources and addressing water pollution. Dyes, a major toxic pollutant, are released from the textile, leather and pharmaceutical industries. The proposed work focuses on enhancing Polyethersulfone (PES) membrane with a cellulose acetate (CA) and multiwalled carbon nanotube (MWCNT) composite for effective dye removal. CA synthesized from food waste exhibited superior mechanical properties and hydrophilicity, while MWCNTs contributed high surface area and mechanical strength. Plasma-treated PES membranes are coated with the CA/MWCNT composite using airbrush techniques. FTIR (Fourier Transform Infra-Red) and XRD (X-Ray Diffraction) analyses confirmed the composite structure and SEM (Scanning Electron Microscopy) revealed improved surface morphology.

A 20 Litre pilot-scale Submerged Membrane Reactor (SMR) is employed (Figure 1) to treat dyes such as Tartrazine, Brilliant Blue, Sunset Yellow and Acid Yellow 17 under varying pH (4–8), dye concentrations (10^{-30} mg/L), and contact times (Hour). Comparative studies (Table 1) showed uncoated PES membranes achieved 80% removal efficiency, whereas CA/MWCNT-coated membranes reached up to 95.24% efficiency, as optimized by Response Surface Methodology (RSM) and Artificial Neural Networks (ANN). The Levenberg-Marquardt algorithm determined optimal conditions: pH 6, contact time 4 hours and dye concentration 10 mg/L.

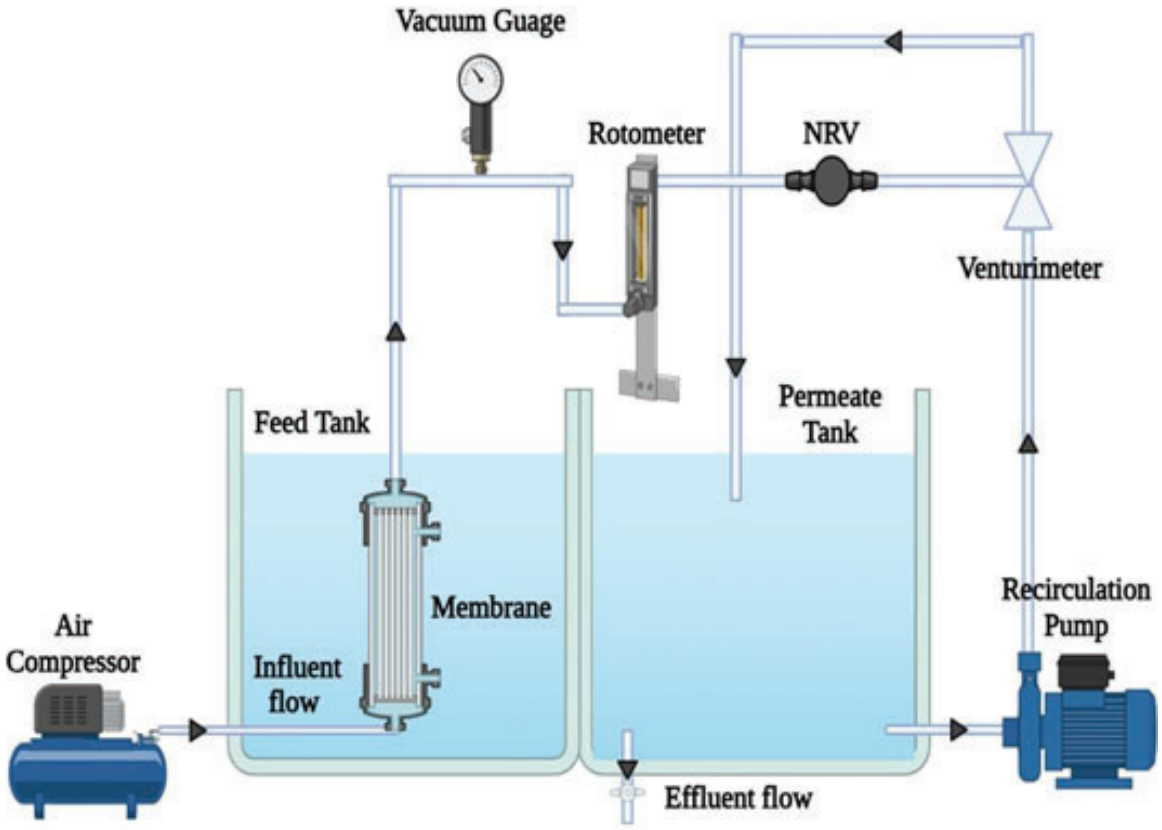


Fig-1: Schematic representation of Submerged Membrane Reactor

The study demonstrates the sustainability and efficacy of CA/MWCNT-coated PES membranes for industrial wastewater treatment. Key future directions include enhanced functionalization of MWCNT for improved selectivity, scale-up studies to evaluate industrial feasibility, testing multi-pollutant removal capabilities (e.g., heavy metals and pharmaceuticals), long-term assessments of membrane durability, fouling resistance and regeneration.

Table 1: Comparative dye removal efficiencies for PES and CA/MWCNT-coated PES membranes under optimal conditions.

Dye	PES Experimental %	PES Predicted %	PES/CA/ MWCNT Experimental %	PES/CA/MWCNT predicted %
Acid yellow 17	47.89 - 88.90	47.11 - 86.73	57.91 - 97.74	56.86 - 96.69
Brilliant Blue	27.00 - 65.00	34.87 - 65.63	39.10 - 75.00	38.75 - 76.25
Sunset Yellow	28.30 - 80.00	28.69 - 81.00	40.50 - 91.00	39.91 - 89.56
Tartarzine	36.12 - 80.24	34.82 - 79.79	48.12 - 93.54	46.12 - 93.54

This research highlights the potential of advanced membrane technology in addressing water pollution, providing a pathway for cleaner water resources and sustainable industrial practices.

Biography

Ms. Sukanya Karuppannan is a dedicated researcher specializing in Biotechnology, currently pursuing her doctoral research at Kumaraguru College of Technology, Coimbatore, India. Her work focuses on developing advanced composite membranes by integrating cellulose acetate (CA) synthesized from food waste and multiwalled carbon nanotubes (MWCNT) for enhanced dye removal efficiency in wastewater treatment. Sukanya's research explores the optimization of membrane properties using artificial neural networks (ANN) and response surface methodology (RSM) to improve dye removal performance, addressing global water pollution challenges.

Her publications on “Influence of Domestic Food Waste Intrusion on Microbes Producing Cellulose” in Biomass and Biorefinery - Springer Nature Journal, contribute to advancing in microbial interactions and cellulose production for sustainable applications. Sukanya's research interests include sustainable water treatment solutions, optimization techniques and the application of innovative materials in environmental remediation. Sukanya aims to bridge the gap between lab-scale innovations and industrial applications, that reflects her commitment in promoting environmental sustainability.

Challenges for Selective Catalytic Naphtha Reforming Products using Response Surface Methodology (RSM)

Rand Q. Al-Khafaji, Duha Khalid and **Muthana K. Al-Zaidi**

Midland Refineries Company, Al-Daura Refinery, Iraq

Catalytic naphtha reforming is a critical process in petroleum refining aimed at producing high-octane reformates essential for gasoline production. This study investigates the optimization of continuous catalytic reforming (CCR) products such as C_{5+}, C_1, C_2, C_3, and C_4 using Response Surface Methodology (RSM). The primary variables considered in this research include Research Octane Number (RON), Naphthenes and Aromatics. A quadratic polynomial equation was developed to predict the yield of reformate products, and experimental validation was performed using Design of Experiment (DOE) and ANOVA analysis. The results demonstrated a good correlation between experimental and predicted values, with C_{5+} yields ranging from 77.27 to 109 vol% and hydrogen (H_2) yields varying from 0 to 1.37. The study also established that increasing Naphthenes and Aromatics enhances reformate production, while RON reduction impacts the yield negatively. The application of RSM enabled a comprehensive understanding of variable interactions and process optimization, ensuring an efficient catalytic reforming operation. This research provides valuable insights for refinery engineers and decision-makers aiming to enhance product quality and efficiency.

Biography

Rand Qusay Kadhim Al-Khafaji, is a dedicated chemical engineer with a strong background in petroleum refining and wastewater treatment. She holds a PhD in Chemical Engineering from the University of Baghdad, where her research focused on the treatment of Iraqi oilfield-produced water using electro-Fenton processes. She also earned her MSc and BSc degrees in Chemical Engineering from Al-Nahrain University, specializing in optimal batch distillation and process optimization. Rand professional experience includes working as a team leader at Zynova Pharmaceutical Company and supervising undergraduate laboratories at Al-Nahrain University. She has presented her research at international conferences and published in renowned journals on topics related to electrochemical water treatment and advanced oxidation processes. Additionally, she has a registered patent for the treatment of oilfield water using an electro-Fenton process. Her technical expertise includes process simulation software such as MATLAB, LABVIEW, CHEMCAD, and ASPEN.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

DFT Analysis of Electronic, Magnetic and Elastic Behavior in $SmMnO_3$

Mohammed S. Abu-Jafar[1], Rowaa S. AL-Jallad[1], A. Samih[2], R. El Fdil[2], Z. Fadil[2], E. Salmani[2], Mahmoud Farout[1], Chaitany Jayprakash Raorane[3] and **Ahmad A. Mousa[4,5]**

[1]Department of Physics, An-Najah National University, Palestine
[2]Laboratoire de Matière Condensée et Sciences Interdisciplinaires (LaMCScI), Mohammed V University in Rabat, Morocco
[3]School of Chemical Engineering, Yeungnam University, Republic of Korea
[4]Middle East University, Jordan
[5]Applied Science Research Center, Applied Science Private University, Jordan

The integrated exploration of electronic, magnetic and elastic properties in cubic and orthorhombic phases provides a holistic characterization of the rare-earth perovskite compound, $SmMnO_3$. Through a comprehensive DFT study, this research explores the electronic, magnetic and elastic behaviors of the material in different phases. Using GGA-PBE and mBJ-GGA_PBE methods, the analysis confirms the semi-metallic nature of both structural forms, highlighting their potential applications in spintronics and magnetic devices.

According to electronic band structure calculations, it was found that in $SmMnO_3$ compound, the cubic structure has a metallic behavior in GGA-PBE and half-metallic in mBJ-GGA-PBE. On the other side, the orthorhombic structure was found to be half-metallic in GGA-PBE and semiconductor in mBJ-GGA-PBE. Therefore, the cubic phase of the $SmMnO_3$ is classified as half-metallic, while the orthorhombic phase of the $SmMnO_3$ is classified as a semiconductor. The electronic study reveals intriguing spin-dependent phenomena, making $SmMnO_3$ a promising candidate for future spintronic applications. The stability of the ferromagnetic phase was attributed to significant exchange interactions in the ascending and descending spin sub-bands, with interactions between Sm+3 and Mn+3 playing a crucial role. The pronounced magnetism of Sm+3 atoms, as indicated by

the effective magnetic moment of $SmMnO_3$, enriches our understanding of the material's magnetic landscape. Furthermore, our analysis of the elastic properties, particularly in the cubic phase, shows compliance with Born's criteria for mechanical stability, confirming the robustness of $SmMnO_3$. In essence, our study advances the understanding of $SmMnO_3$ and paves the way for subsequent investigations and potential technological advances in the field of spintronics and magnetic devices.

Biography

Prof. Mohammed Abu-Jafar achieved his PhD degree in Physics from Southern Illinois University (S.I.U.) at Carbondale-U.S.A. in 1991. He has been awarded a teaching assistant during his master and PhD studies in Jordan University and S.I.U. He was a Chairman of Physics Department between 2001-2003. He was also a chairman of graduate studies for natural sciences between 2004-2007. He was the Dean of the Faculty of Graduate Studies between 2008-2014. He spent his sabbatical leave as a Postdoc at La Sapienza university, Rome, Italy in 2015 for one year. Twenty-seven master & PhD students have been graduated under his supervision. Four conferences have been held under his supervision too. His research of interest currently is related to the computational condensed matter physics using FP-LAPW method (WIEN2k code). Prof. Abu-Jafar has published more than 68 papers in a well-known international journal. He is cooperative with many international journals as a reviewer.

Sun-Powered Synthesis: Harnessing Multiwall Carbon Nanotube-EB Photocatalytic Magic in a Unified Photocatalytic-Biocatalytic System for Solar-Driven L-Glutamate Production from α-Ketoglutarate

Sunita Singh[8], Abhishek Mishra[1], Rajesh K. Yadav[1], Shaifali Mishra[1], Rehana Shahin[1], Satyam Singh[1], Abhishek Kumar Gupta[2], Rajat Singhal[3], Navneet K. Gupta[3], Jin-OoK Baeg[4], Gamal A. El-Hiti[5] and **Krishna Kumar Yadav[6,7]**

[1]Department of Chemistry and Environmental Science, Madan Mohan Malaviya University of Technology, India
[2]Department of Physics, Harcourt Butler Technical University, India
[3]Centre for Sustainable Technologies, Indian Institute of Science, India
[4]Korea Research Institute of Chemical Technology, South Korea
[5]Department of Optometry, King Saud University, Saudi Arabia
[6]Faculty of Science and Technology, Madhyanchal Professional University, India
[7]Environmental and Atmospheric Science Research Group, Al-Ayen University, Iraq
[8]Department of Biochemistry, University of Delhi, India

Artificial photosynthesis, which mimics the natural process used by plants, offers a promising strategy for harnessing solar energy to produce valuable fuels. One intriguing approach is the photocatalyst-enzyme attached system, where a photo-catalyst captures light energy and transfers it to an enzyme to drive specific chemical reactions. This study describes the synthesis of a novel photocatalyst (MWCNTCEBr) formed by coupling multiwall carbon nanotubes (MWCNTs) with a dye ethidium bromide (EBr) *via* a condensation reaction. The resulting photocatalyst exhibits excellent charge separation and migration abilities, leading to enhanced photocatalytic activity. Notably, MWCNTCEBr photocatalyst successfully converts α-Ketoglutarate to L-Glutamate (81.9%) and photo-regeneration of NADH (76.20%) under the influence of solar radiation. Therefore, the study demonstrates the development and the application of MWCNTCEBr photocatalyst for impressive NADH regeneration and bio-transformation.

This study presents a novel and efficient method for synthesizing an MWCNTCEBr photocatalyst with promising properties for potential applications.

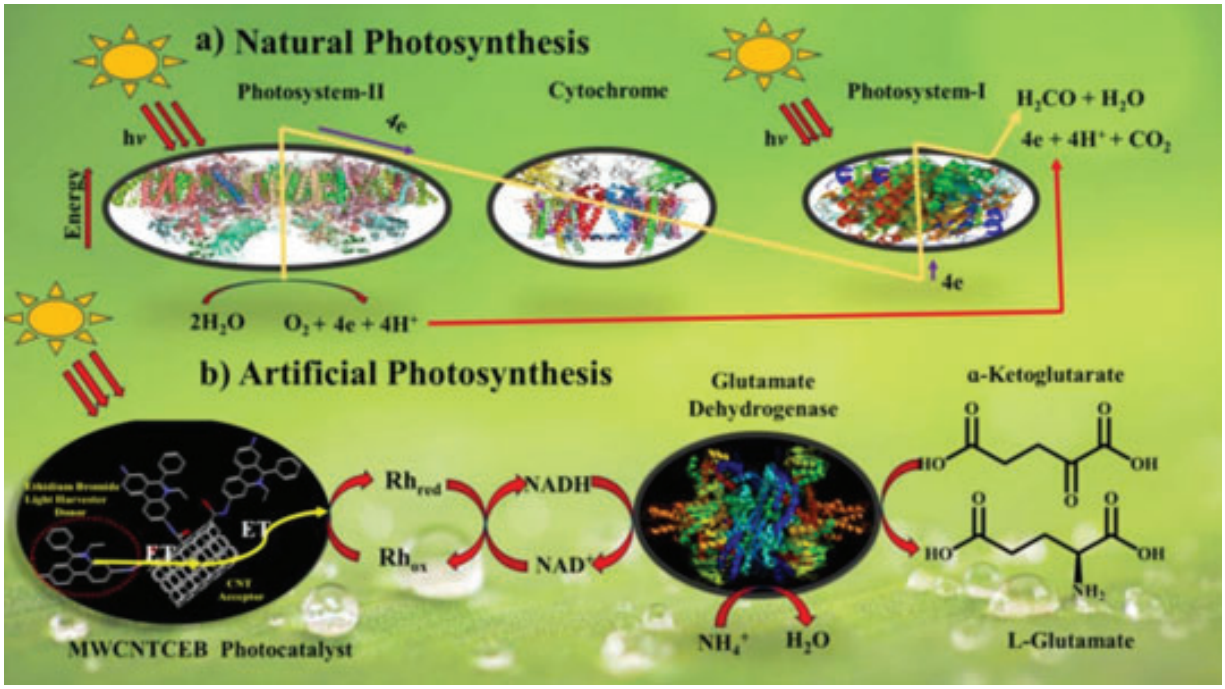


Fig:

a): Schematic representation of a natural photosynthesis that involves a transfer of electron from PS -II to PS -I for the production of carbohydrates and oxygen.

b): Artificial photosynthesis contains a photocatalyst (MWCNT) which is used for conversion of α-Ketoglutarate to L- Glutamate.

Biography

Dr. Sunita Singh, Associate Professor, Department of Biochemistry, Shivaji College, University of Delhi, Raja Garden, New Delhi 110027, India

Academic Qualifications:

1. Post-Doc research experience of seven years from Department of Chemistry, Indian Institute of Technology (IIT), Delhi, India.
2. PGDB (Post Graduate Diploma in Bioinformatics), Directorate of Open & Distance Learning (DODL), Jamia Hamdard University, New Delhi, India.
3. PhD (Medical Biochemistry), SN Medical College, Dr. B.R. Ambedkar University, Agra (UP), India
4. M.Sc. Biochemistry, University of Allahabad, Allahabad (UP), India

Area of Research Interests: Bioremediation, Nano biocatalysts, Nano formulations, Bioinformatics, Protein Interactions and Molecular Biology.

Papers Published in International Journals: 32

Papers Published in National Journals: 5

Other Publications in National and International Journals: 4

Published/Co-published the following chapter/book: 5

Research Awards: 3

- Woman Scientists Scheme (SR/WOS-A/LS-181/2007) of Department of Science Technology (DST) for Research in Basic/Applied Sciences, project titled "Three Phase Partitioning for Selective Permeation of Microbial Cells".
- Young Scientist Award of DST (under SERC FAST Track Scheme for Young Scientists 2001-02; project titled Applications of free bioligands in two phase separations of enzymes and cells.
- Senior Research Associate (Pool Officer) of Council of Scientific and Industrial Research (CSIR) (Pool no. 7446 A) from May 10, 1999 to May 09, 2002.

Research Projects (Completed & ongoing): 8

Resource Person: Delivered lectures in Workshops, Conferences and Faculty Development Programmes.

Participated/Attended refresher courses, orientation courses, research methodology workshop/Syllabus up-gradation, teaching learning-evaluation, technology programmes and Faculty Development Programme.

Co-ordinator / Convener: 10

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Studies of the Extraction Efficiency of Gallium in Bauxite Ore Deposits from Sefwi Awaso, Ghana, using the Bayer Process

Nafiu M. Zainudeen[1,2], Dennis K. Adotey[2,3], Andrew Nyamful[3,5], Latifatu Mohammed[4] and **Shiloh K. Osae[2]**

[1]CSIR - Institute for Scientific and Technological Information, Ghana
[2]Department of Nuclear Sciences and Applications, University of Ghana, Ghana
[3]NNRI, Ghana Atomic Energy Commission, Ghana
[4]Institute of Industrial Research, Council for Scientific and Industrial Research, Ghana
[5]Department of Nuclear Engineering, University of Ghana, Ghana

Gallium is regarded as a linchpin of the electronic industry due to its overwhelming application in the semiconductor industry; gradually replacing silicon (Si) as the most preferred metal used for most semiconductor in electronic gadgets. Ghana's bauxite ore are exported for its alumina content even though it contains other precious metals like gallium and scandium. The continuous export in its raw state without any value addition; denies the country full economic benefits of the ore. The study assessed the economic viability of Gallium in Bauxite Ore Deposits at Sefwi-Awaso. The achievement of this endeavour was through: (a) geochemical and mineralogical characterization of the bauxite ore; (b) estimation of percentage recovery of gallium from bauxite ore after autoclave digestion and solvent extraction of gallium; with subsequent characterization of gallium extract; (c) evaluation of $Al(OH)_3$ masking efficiency prior to solvent extraction; and characterization of masked $Al(OH)_3$ for presence of residual gallium; and, (d) comparative estimation of the economic viability of gallium in the ore. Extraction of Ga was done using the Bayer process (autoclave digestion of ground homogenate of the ore, and subsequent liquid-liquid extraction of the Ga from spent liquor, using extractant made up of *kelex-100*, ethanol as modifier and kerosene as diluent). The levels of Ga and Al in the various fractions were assessed using XRF spectrometry and k_0-INAA. From the XRD analysis, the mineral constituents of the ore are gibbsite [Al $(OH)_3$], Kaolinite [$Al_2Si_2O_5(OH)_4$], Rutile [$Al_{0.08}Cr_{0.01}Nb_{0.01}Ti_{0.91}O_2$], Quartz [$SiO_2$], Hematite; Goethite [$Fe_2O_3$; Fe

$(OH)_2$] and Alabandite [MnS]. Gibbsite (82.7-98.6%) was identified as the dominant mineral; with the others present in trace amounts [0.6-9.8% (Hematite & Goethite), 0.3-1.9% (Quartz), 0.4-1.8% (Rutile), 3.7% (Kaolinite), and 0.1% (Alabandite)]. About 63.5% of Ga present in the bauxite homogenate (38.934 mg/kg) was recovered. Percentage yield of Ga in the final organic extract ranges between 41.62%-48.23%. Considering the good stability of the yield for several replicate bauxite samples over a period of time shows a promising prospect for Ga extraction in bauxite ore from Sefwi-Awaso using the Bayer process.

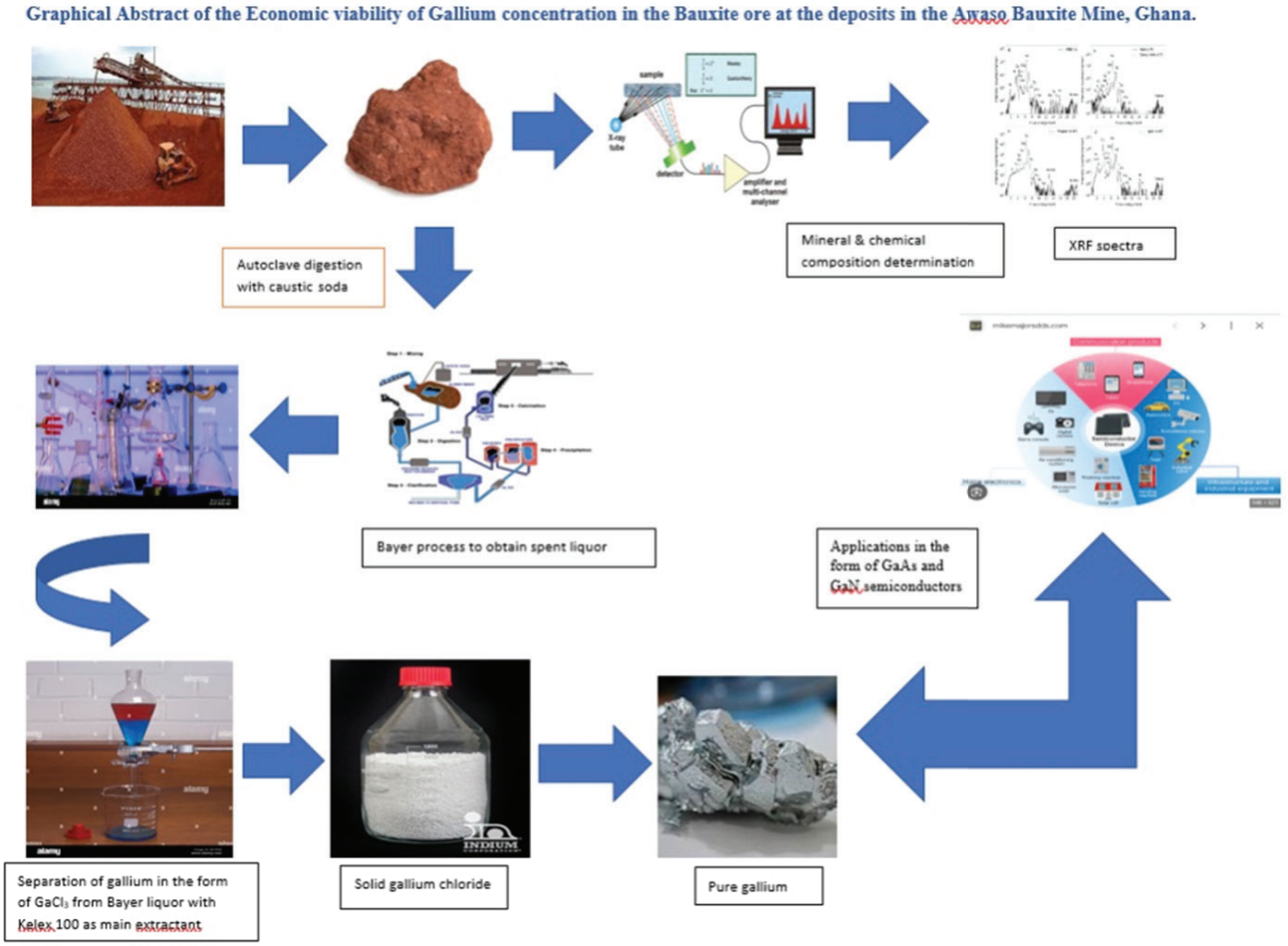


Fig: Graphical representation of the process of recovery of Gallium from bauxite ore deposit through the autoclave digestion of the ore followed by Liquid-liquid extraction of the Ga from the aqueous digestion liquor with organic extractant.

Biography

Nafiu Mohammed Zainudeen is a Chemical Engineering Research scientist with Institute of Scientific and Technological Information (INSTI); and one of the 13 institutes of the Council for Scientific and Industrial Research (CSIR), Ghana. He is currently the Lead Scientist at the Fluid Science Division of INSTI. His research interests have been from Renewable energy with emphasis on Biogas production, Fuel cell development and Separation process where ethanol-water mixtures are separated into fuel grade to power vehicles.

His bachelor's degree was from Middle East Technical University, Ankara, Turkiye. He completed his master's programme from Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, where he specialized in Separation processes.

He obtained his Ph.D. from the University of Ghana, Legon, in Nuclear & Environmental Protection where his research centred on the extraction techniques of Gallium from Bauxite. He is currently also researching into the remediation of polluted water due to artisanal gold mining (galamsey).

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Subchronic Toxicity Study of Herbal Tea of *Moringa Stenopetala* (Baker f.) Cudof. and *Mentha Spicata* L. Leaves Formulation in Wistar Albino Rats

Abinet Admas[4], Abdu Hassen Musa[1,2], Asfaw Debella Hagos[2], Girmai Gebru Dimsu[1], Eyasu Makonnen Eshetu[3], Mesfin Asefa Tola[4], Abiy Abebe Gelagle[2] and **Boki Lengiso Tullu[5]**

[1]Department of Anatomy, Addis Ababa University, Ethiopia
[2]Traditional and Modern Medicine Research Directorate, Ethiopian Public Health Institute, Ethiopia
[3]Department of Pharmacology and Clinical Pharmacy, Addis Ababa University, Ethiopia
[4]Department of Pathology, Saint Paul's Hospital Millennium Medical College, Ethiopia
[5]Directorate of National Reference Laboratory for Clinical Chemistry and Hematology, Ethiopia

Background: *Moringa stenopetala* (Baker f.) Cudof. and *Mentha spicata* L. are widely used in the traditional system of medicine for the treatment of diabetes, hypertension, digestive problems and various disorders. The leaves formulation of *M. stenopetala* and *M. spicata* herbal tea showed better antidiabetic and antihypertensive effects in rodent models. However, its long-term safety profile has not been investigated yet. Thus, this study investigated the subchronic (90 days) oral toxicity of the leaves formulation of *M. stenopetala* and *M. spicata* herbal tea in Wistar albino rats.

Methods: Four groups of rats (n = 10, with 5/sex/group) were randomly assigned into a control (vehicle) group and three test groups (559.36, 1118.72 and 2237.44 mg/kg, respectively). The three test groups received the herbal tea of *M. stenopetala* and *M. spicata* leaves blend daily for 90 days. The control group received distilled water. During the treatment period, clinical signs were observed daily and food consumption and body weight changes of the rats were measured weekly. At the end of the experiment, macro-pathological, hematological and biochemical parameters were evaluated. Furthermore, histopathology of liver, kidney, heart, stomach and pancreas were examined.

Results: Subchronic oral administration of the herbal tea of *M. stenopetala* and *M. spicata* leaves blend did not result in death or significant toxicity signs in the treated group rats.

Moreover, the herbal tea caused no significant changes on body weight, food intake, organ weight, hematological and biochemical parameters in either sex. However, the serum AST, CK and LDH levels were significantly elevated in rats treated with 2237.44 mg/kg of herbal tea in both sexes. There was no significant alteration in the histology of organs, only minor lesions in the liver, kidney and pancreas were observed.

Conclusion: The study results indicate that the herbal tea of *M. stenopetala* and *M. spicata* leaves blend is relatively safe/low toxic to rats in subchronic exposure. However, further pre-clinical (chronic, teratogenic, reproductive and developmental toxicity) studies in animals are required in order to have sufficient safety and toxicity profiles for its use in humans.

Biography

Abinet Admas was born and raised in Addis Ababa, Ethiopia. After the completion of her higher education, she joined in Hayat Medical School to complete her Doctorate Degree. Then, she won a scholarship to continue her residency in Pathology at Saint Paul's Hospital Millennium Medical College.

She has been working as a pathologist for the Ethiopian Federal Police Referral Hospital and in several private hospitals for the past four years. Abinet participate in several research projects, including the effects of traditional herbal leaves on internal organs and cervical cancer screening programs. She also engaged in teaching undergraduate students and residents.

She is hard-working and always eager to learn new things and improve her skills. She has been awarded as 'best-practicing pathologist of the year 2022 G.C.' from Onco Pathology Diagnostic Center in Ethiopia.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Development of Methodology for The Pilot-Scale Ultrasound Treatment for the Removal of Pesticides Residues from Fresh Leeks

Eliot Botosoa[1], Valentin Jorand[1], Jérôme Bony[2], Mathieu Vanderriele[3], Giovanni Caria[4], Gaoussou Karamoko[1], Nicolas Proix[4], Elise Pelzer[3], Christine Chèné[2] and **Romdhane Karoui[1]**

[1]University of Artois, France
[2]ADRIANOR, Tilloy Les Mofflaines, France
[3]INRAE, Laboratoire D'analyses des Sols, Saint Laurent Blangy, France
[4]Chambre d'Agriculture de Hauts-de-France, France

The development of innovative technique in the framework of pesticides treated vegetable cleaning represents a huge stake and different challenges in the sector of food industries and their equipment manufacturers. This project was carried out on the development of ultrasound technique for cleaning leeks after pesticides treatment.

Our approach considered the whole itinerary from the field to the cleaning step. Leeks were cultivated at the station of the regional center for experimentation in vegetable crops by Pôle Légume Région Nord to allow the control of the cultivation itinerary of the samples. They were treated in the field with fungicides composed of boscalid and pyraclostrobin.

Fresh treated leeks collected from the field were cleaned by using a pilot-scale ultrasound bath containing tap water. An experimental design of the treatment was applied by playing with parameters such as time and use or non-use of ultrasound technique. After cleaning, the dynamic of fungicides removal from the leeks to the cleaning water was monitored by using two techniques of injection on gas chromatography coupled to mass spectrometry (GCMS), namely liquid injection (LI) and Stir Bar Sorption Extraction (SBSE). For this purpose, fungicides molecules remained on leeks and those taken down in the cleaning water were monitored by using LI and SBSE, respectively. The results obtained showed that the use of ultrasound technique allowed to increase the yield of removal

efficiency of molecules such as fungicides when compared to the normal treatment.

This yield can reach a value varying between 58% and 85% for boscalid depending on the level of the field treatment of leeks and the duration of cleaning. The same tendency was obtained with pyraclostrobin. Looking ahead, food quality assessment represents the next strategy to be addressed along with the development of an environmentally friendly method to decontaminate pesticide-laden cleaning water.

Biography

Eliot is an associate professor at the University of Artois (Arras-FRANCE). His background is analytical chemistry with a strong development of method in spectral techniques including ^{13}C NMR, 2D and 3D Fluorescence spectroscopy and Infrared spectroscopy and chromatography analyses such as UHPLC and SPME-GCMS. His expertise is in food engineering with a particular focus on cereal food and fat, food quality, food formulation, and food safety. Eliot research interests are focused on food chemistry/biochemistry with emphasis on bioactive compounds mainly from plant, animal and other sources. For this purpose, his research works address different areas related to lipids (omega-3 and other specialty oils), lipid oxidation, lipid biotechnology, natural antioxidants, seafood quality, by- product valorization, carbohydrates (use of gums), impact of contaminants on food quality, and process induced chemical changes in foods.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Effect of Cathode Surface Area on the Electrodeposition Rate, Composition and Microhardness of Co–W Coatings Deposited from a Citrate Bath

A. V. Gotelyak[1] and **A. I. Dikusar**[2]

[1]Shevchenko Pridnestrovie State University, Moldova
[2]Institute of Applied Physics, Moldova State University, Moldova

Interest to tungsten and its alloys is due its unique properties. Tungsten is the most refractory metal. Tungsten can form alloys with cobalt, iron, nickel, and other metals and react with various chemical elements, thus eliminating negative effects of some of them (sulfur and phosphorus) in alloys, which is very important in production of quality steel. In theory, however, tungsten, which is more negative than hydrogen in the electrochemical series of metals, cannot be obtained from aqueous solutions. Therefore, electrochemical deposition of tungsten from its aqueous and aqueous–organic solutions is quite challenging. It is for this reason that the development of methods for electrochemical deposition of alloys of iron group metals with tungsten, as well as with other refractory metals (Mo, Re), is one considerable problem in expanding the area of its industrial application; it will also lead to cost reduction of deposited coatings. Here, by the example of galvanostatic electrodeposition of Co–W coatings from a citrate bath, we demonstrate experimentally that when using the results on the deposition rate and the composition and properties (microhardness) of resulting coatings observed under laboratory conditions to develop this type of an electrodeposition process on a larger (industrial) scale the bath volume must be scaled in proportion to the increase in the cathode area. In this case, the current loading on the electrolyte, which is quantitatively expressed as the volume current density, does not increase.

Biography

Gotelyak Alexander Vyacheslavovich was born on July 26, 1989 in Ukraine and graduated in 2011 from the Pridnestrovian State University named after T.G. Shevchenko. In 2022, in Ivanovo, Russia, he defended his dissertation on the topic “Induced coprecipitation of alloys from iron group metals with tungsten and the mechanical properties of coatings.” He works in the research laboratory "Electrochemical Technologies". The research results were implemented at an existing enterprise for the production of electric motors. His areas of interest: refractory metals and alloys, induced coprecipitation, production of electrochemical coatings with the possibility of their practical application.

Forensic Discrimination of Blue Fountain Pen Inks Based on Dielectric Constant Property

Ozlem Simsek[1] and **S. Selim Seker**[2,3]

[1]Department of Chemical Engineering, Faculty of Engineering and Natural Sciences, Üsküdar University, Turkey
[2]Department of Electrical-Electronic Engineering, Üsküdar University, Turkey
[3]Department of Electrical and Electronics Engineering, Boğaziçi University, Turkey

This study seeks to examine and compare fountain pen inks, which are essential in forensic document inspection of items such as checks, marriage certificates, and birth and death records and are particularly susceptible to fraud in developing nations. This context addresses the dielectric characteristics of the substance. The assessment of dielectric constant is an innovative and thorough technique for differentiating fountain pen inks. To accomplish this objective, the dielectric constant of blue fountain pen inks commercially available in Turkey was analysed, hence assessing the inks' distinguishability.

The results were acquired by an experimental configuration utilizing alternating current (AC), a function generator, and an oscilloscope, with the resistance values of each fountain pen ink sample examined. The measurements were conducted at ambient temperature within the frequency range of 1 Hz to 3 MHz. The dielectric constant was determined using the acquired resistance values. To corroborate the findings, the identical samples were additionally examined using conventional techniques of TLC. In a novel approach to TLC analyses, image analysis (IA) was utilized to segregate samples based on red, green, and blue (RGB) intensity profiles using PyCharm Community 2024.1.1 software. The outcomes derived from both strategies were congruent.

Upon examining TLC-IA similarity rates, it was found that the average value was 78%. Furthermore, the latest technique, the dielectric method, enabled the differentiation of samples according to their dielectric constants within the frequency range of 2–2.5 MHz and their loss factors within the 0–1 MHz range. The analysis of dielectric characteristics,

a novel technique, facilitates the identification of various fountain pen inks based on the acquired data.

The study concluded that the analytical results for the Dielectric Constant offer a novel perspective for application in forensic sciences.

Biography

Dr. Ozlem Simsek is a forensic chemist and academician with a PhD in Forensic Sciences from Üsküdar University. She has extensive experience in chemistry, forensic sciences, and sustainability research, specializing in forensic ink analysis, dielectric properties in forensic investigations, and sustainable materials.

Currently, she is a Graduate Research and Teaching Assistant in the Chemical Engineering Department at Üsküdar University. She integrates data science and computational tools, including Python and MATLAB, into forensic and sustainability research.

Dr. Simsek has international research experience from the University of Central Lancashire (UK) and Dublin City University under Erasmus+ programs. She is a member of the Royal Society of Chemistry and the Chartered Society of Forensic Sciences. Believing that “science is exploring the invisible behind the visible” she is committed to advancing forensic science and sustainability through research and education.

Biochar Synthesis using Sawdust and its Effect on Tomato Plants

Rachna Bhateria, Meenu Yadav and **Kiran**

Department of Environmental Science, Maharshi Dayanand University, India

Biochar, a carbon-rich material, has been used as a sustainable amendment to mitigate environmental risks, improve plant growth and soil properties. The tomato is an important economic crop that is a main ingredient of some prepared food and an agricultural industry focus. This study investigates the impact of sawdust-derived biochar on the growth and yield of tomato plants (*Solanum lycopersicum*), a key horticultural crop with high economic and nutritional value. Biochar, was synthesized under controlled pyrolysis conditions at 4500C and characterized using SEM, FTIR and XRD to identify functional groups and crystalline structures. The material's high porosity, surface area, and cation exchange capacity (CEC) were found to enhance soil properties and plant growth. Applying 2%, 4%, and 6% biochar significantly accelerated fruit production and improved plant growth. Soil analysis revealed significant improvements with 6% biochar, including increased moisture content, electrical conductivity, organic carbon content, CEC, and water-holding capacity, highlighting biochar's role in enhancing soil fertility and water retention. Comparative analyses revealed that biochar-amended soils resulted in a 26.4% higher leaf count and a 15% rise in fruit yield compared to untreated soils. These findings highlight biochar's potential to improve crop productivity, especially in regions with arid and degraded soils. This research provides a compelling basis for incorporating biochar as a sustainable strategy to enhance crop yield and soil health, offering a scalable solution to mitigate challenges posed by conventional farming practices.

Biography

Dr. Rachna Bhateria is currently working as an Associate Professor in the Department of Environmental Science, Maharshi Dayanand University, Rohtak (Haryana) India. She has published several research articles in peer-reviewed international journals and book chapters. She has experience of teaching post graduate students of more than 15 years. Till now, 4 research scholars have successfully completed their doctorate degree under her supervision. She has contributed in e-content development on national platforms like e-PG Pathshala, SWAYAM Prabha, e-gyan kosh etc.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Recent Advances in Utilization of Biochar in Wastewater Treatment

Meenakshi Nandal

Department of Environmental Science, Maharshi Dayanand University, India

Agricultural residues pose significant environmental challenges due to their accumulation and improper disposal. Turning these residues into biochar, a carbon-rich substance made by pyrolysis, is one possible and promising option. It also contributing towards long-term carbon sequestration and mitigating climate change impacts as biochar has potential to acts as a carbon sink. To address pollution and waste management challenges, biochar made from agricultural waste has demonstrated considerable potential in the adsorption and removal of dyes from wastewater. Its porosity, large surface area, and functional groups enable it to effectively trap dye molecules. Using biochar offers an environmentally benign way to address the worldwide issue of dye pollution in wastewater treatment and provide a sustainable strategy for managing agricultural residues. The objective of this study is to employ rice straw biochar to remove crystal violet (CV) and methylene blue (MB) dye from aqueous solutions simultaneously. Different parameters, such as pH, contact time, adsorbent dosage, and initial pollutant concentrations, were assessed in order to determine the adsorption capability of biochar for various pollutants. The results showed that rice straw biochar efficiently removed MB and CV dye, with maximum removal percentages of 90.47% and 90.32%, respectively. Using scanning electron microscopy (SEM) and fourier-transform infrared spectroscopy (FTIR) to characterise the biochar both before and after adsorption, the result showed that functional groups on the surface of the biochar interacted with MB and CV dye. This research demonstrates that biochar made from rice straw is a promising tool for removing organic dyes from wastewater, offering an affordable and environmentally friendly solution.

Biography

Dr. Meenakshi Nandal is an Associate professor in Department of Environmental sciences, Maharshi Dayanand University, Rohtak, Haryana, India. She has completed her Ph.D. in Biosciences from Maharshi Dayanand University. To her credit one major and one minor research project funded by Radha Krishnan funds and BRNS (Board of Research in Nuclear Sciences) completed by her. To widen her academic attainments and credits she has published two editorial books, more than 25 research articles and book chapters in reputed national and international journals. She is actively engaged in the research field and guided many M.Sc. dissertation students and research scholars. Her areas of expertise are solid waste management, water quality analysis, soil contamination, monitoring of natural radiation, air pollution, human health impact, etc.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

A Novel Approach to Measure the Untraceable Amount of Cetirizine and Fexofenadine in Drinking Water

Yasaman Parvisi[1], Maryam Shekarchi[2], Hosein Rastegar[2], Muhammad Irfan-Maqsood[3], Azra Izanloo[4] and **Masoud Mirkazemi[5]**

[1]Department of Pharmaceutical Research, Islamic Azad University, Iran
[2]Food and Drug Control Laboratories, Ministry of Health and Medical Education, Iran
[3]Azerbaijan Technical University, Azerbaijan / IMAQ Transdisciplinary Research Support Center, Canada
[4]Imam Reza International University, Iran / Department of Financial Engineering, Islamic Azad University, Iran
[5]Department of Orthopediconcoloy Surgery, Islamic Azad University of Medical Sciences, Iran

Background: Pharmaceutical residues in the drinking water have become a major challenge of the modern urban life because bioaccumulation of these residues in human bodies has been considered the major cause of trending disorders such as infertility, drug resistance, hormonal imbalance etc. Although protocols have been implemented to detect and eliminate these residues to purify the drinking water but inspite of huge efforts, the untraceable amount of these substances remains intact.

Purpose of Study: Considering the significance of detection of pharmaceutical residues in drinking water, the current study was performed to develop a novel approach to measure the untraceable amount of Cetirizine and Fexofenadine by using an in-lab developed nanosheets of graphene oxide to act as suitable adsorbents of compounds of the antihistamine family.

Methods: These graphene nanosheets were characterized following the adsorption kinetics, contact time, temperature, pH, desorption rate, volume effect on adsorption and desorption concentration. FT-IR and XRD methods were also used to detect the nanoparticles.

Results and Conclusion: It was observed that the best pH for Cetirizine and Fexofenadine adsorption is 3 and 6, respectively by using methanol as an optimal solvent. The quadratic equation of both drugs paints a clearer picture of absorption. The validation test of the sample condensation by graphene oxide adsorbent exhibited that using the synthesized adsorbent, the analysis power of these drugs in water samples can be enhanced from mg/L units to µg/L, which helps analyze very small amounts of these compounds in aquatic environments. On the other hand, the maximum adsorption capacity of 28.2 and 26.42 mg/g for Cetirizine and Fexofenadine, respectively, indicates the high adsorption capacity of this substance to treat pollution of waste water discharged by pharmaceutical factories.

Biography

Yasaman Parvisi received her doctorate degree in pharmacy from Islamic Azad University, Pharmaceutical Sciences Branch, Tehran, Iran in 2015. Since then, she has served as the pharmacy manager at Erfan Niayesh Hospital. Her research interests include pharmaceutical chemistry, the environmental impact of pharmaceuticals, and the clinical therapeutic efficacy of various drugs.

ADV. CHEMISTRY 2025

DAY 02

6th EDITION OF

ADVANCED CHEMISTRY WORLD CONGRESS

LONDON, UK

MARCH 27-28, 2025

SPEAKER TALKS

Improved Technology for Production of High-Quality Dore from Ores with Gold / Silver and Host Minerals with Copper and Lead

Jose Refugio Parga Torres

Department of Metallurgy and Materials Science, TecNM-ITS, Mexico

Worldwide, people have been recovering Dore as the primary metal in ores that contain gold and silver since 1887. The process involves three steps: cyanidation leaching, cementation with zinc dust, and smelting the precipitate. However, the operation time and consumption of reagents (cyanide, zinc dust, smelting fluxes, and used crucible) are higher due to the impurities in the ore and in the rich solutions.

In this regard, this study presents a simultaneously oxidation/cyanidation leaching for recovery gold and silver in 90 minutes. Then, two processes are used to clean the high concentrations of iron, copper, zinc, and lead metals from the sludge of the electrocoagulation (EC) process to produce, in the next step, on the induction furnace a Dore of high quality (99%). The first step in this EC is to recover gold and silver in the form of sludge contaminated principally with magnetic iron, in a hermetic reactor using AC, air injection, and iron electrodes, where HCN (gas) is also formed, and simultaneously in another hermetic reactor also regenerating the NaCN with sodium hydroxide with efficiencies of 90%.

Finally, to remove efficiently the remaining copper, iron, and lead in the Dore, in the induction furnace we used a crucible that has a ceramic tube with oxygen injection that makes the current gas efficiently agitate the melt Dore with the fluxes and hydroxyapatite to remove all remaining of the last impurities (Cu and Pb) in the Dore, and then finally we had a product of 99% quality in 24 hours.

Biography

Prof. José R Parga Torres obtained a degree in Chemical from the TecNM-ITL and a M Sc from Colorado School of Mines and a Metallurgical Ph D from University of Utah respectively. He is best known for his research contributions associated of 45 years focused on the recovery of gold and silver, non-ferrous metals, Dr. Parga's scientific merits are numerous with over 45 awards at both national and International for his laudable contributions, he has more than 200 papers with ISSN, 16 books with ISBN, 13 registered patents. His research expertise currently has 7,250 citations from the scholar google account.

Nanotechnologies for Bio Chemicals Detection

Ajay Agarwal

Department of Electrical Engineering, Indian Institute of Technology Jodhpur, India

Biochemical detection is key to Point-of-Care (PoC) and early diagnostic devices which are major contributors to the healthcare market. These applications include kits for glucose monitoring, infectious diseases testing including COVID-19, cardio-metabolic monitoring, coagulation monitoring, urinalysis, cholesterol test strips, tumor/ cancer markers, pregnancy and fertility testing and many other products. The use of nanotechnologies to realize highly sensitive sensors, along with micro-fluidics, are leading to sample-to-answer operations on a chip, suitable for healthcare applications. These lab-on-a-chips are also integrated with readout electronics, embedded with AI based algorithms.

Nanotechnologies consorted with micro-fabrication and MEMS have enabled novel nano-dimensional materials, structures and eventually devices which find several applications in the field of early-stage and point-of-care diagnostics and therapeutics.

Among various nanomaterials realized, CNT, Nano-Gap and Nanowire based bio-chemical sensors are most utilized for the diagnostic applications. Nano-Gap sensors work on two principles; either on the 'change of the conductivity' of the sensing layers between the nano-electrodes when exposed to analytes or based on 'Electro-magnetic enhancement' using micro-Raman spectroscopy. Nanowire sensors work on the principle of 'Field Effect Transistor' (FET) where charges associated with the chemical molecule, or the biological specie is attached on the nanowire surface and acts as chemical or bio-gate; the devices are hence termed as CHEM-FET or BIO-FET. MEMS based gas detectors, as breathe analyzer are also being explored for various diagnostic/ screening applications.

The technology details suitable for mass realization of the sensor platforms like Nano-Gap arrays for Surface Enhanced Spectroscopy (SERS) and Silicon nanowires arrays, along with their use cases in point-of-care and early diagnostic applications will be discussed in detail.

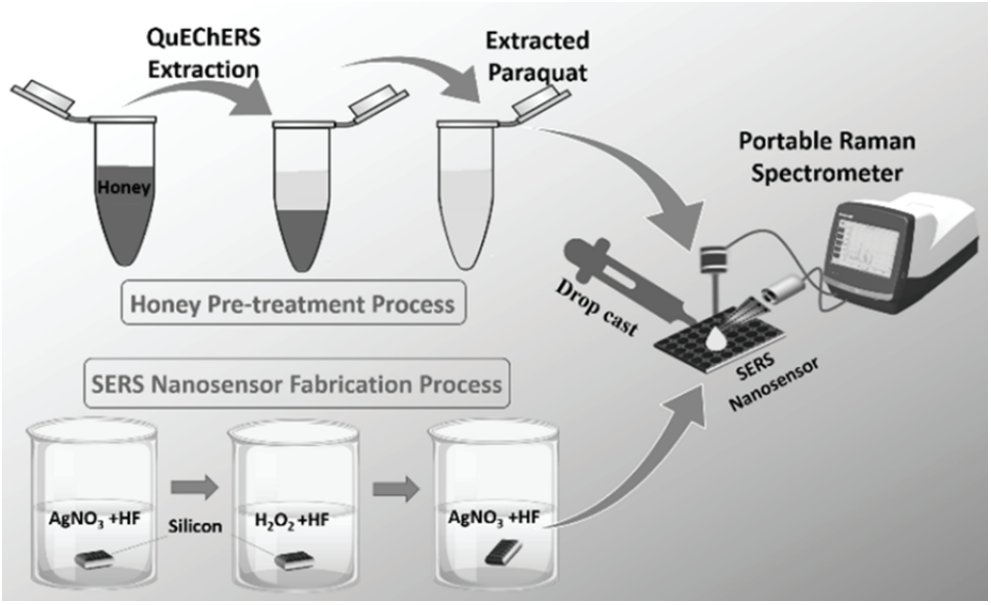


Fig: Snapshot representing SERS nano chip fabrication, sample processing and testing protocols using portable Raman Spectrometer.

Biography

Ajay Agarwal is Professor at Dept. of Electrical Engineering, Indian Institute of Technology Jodhpur, India; an adjunct faculty at Division of Interdisciplinary Research Program (IDRP); Core committee member of Medical Technologies. He is Joint-PI for CoE in "AYURTECH for Integrative Precision Health and Medicine". Prof. Ajay is also Director, Electronics Sector Skills Council of India (ESSCI), New Delhi, founding Director of a startup – 'Sarbit Innovations' & mentor of another startup – 'Caldor Health Technologies'. Earlier, he worked at CSIR-CEERI, Pilani as Coordinator-Smart Sensors Area and Associate Dean, at AcSIR, New Delhi. He also served at A*Star - Institute of Microelectronics, Singapore, Semiconductor Complex Ltd., Chandigarh & USHA India, Faridabad.

He has ~300 research publications, >100 invited/ plenary/ keynote talks and 40 patents. He has supervised or guided 29 Ph.D. students. He is a member / fellow of various professional societies and is bestowed with various awards.

A Survey of Intelligent Reflecting Surfaces: Performance Analysis, Extensions, Potential Challenges and Open Research Issues

Adil Khan[1], Syed Agha Hassnain Mohsan[2], Abdelrahman Elfikky[3], Ayman I. Boghdady[4], Shabeer Ahmad[5] and **Nisreen Innab[6]**

[1]School of Information Engineering, Xi'an Eurasia University, China
[2]Ocean College, Zhejiang University, China
[3]Baskin School of Engineering, University of California, USA
[4]Arab Academy for Science, Technology and Maritime Transport, Egypt
[5]Beijing University of Posts and Telecommunications, China
[6]College of Applied Sciences, AlMaarefa University, Saudi Arabia

The rapid advancements in wireless communication have underscored the need for innovative solutions to enhance network performance, spectral efficiency, and energy savings. Intelligent Reflecting Surface (IRS) technology has emerged as a transformative approach that passively reconfigures wireless propagation environments, offering significant improvements without active power consumption. This survey provides a comprehensive analysis of IRS technology, covering its architecture, operational principles, and integration into next-generation wireless networks as shown in Fig.1. We examine key performance metrics in various application scenarios, demonstrating IRS's potential to improve coverage, signal quality, and energy efficiency, with up to 40% higher spectral efficiency and substantial energy savings over traditional networks. The survey also explores the integration of IRS with advanced multiple access techniques such as Non-Orthogonal Multiple Access (NOMA) and Terahertz (THz) communication, positioning IRS as a critical enabler in future 6G networks. This survey contributes by offering an in-depth review of IRS design principles and operational mechanisms, presenting a performance analysis in various scenarios that highlights IRS's ability to improve network efficiency, and identifying practical challenges and open research areas, such as the need for robust channel estimation methods, effective interference management in dense networks, and IRS solutions scalable for urban and rural deployments. Additionally, we discuss the future

trajectory of IRS standardization and the regulatory frameworks essential for large-scale deployment. By summarizing advancements and identifying key research directions, this survey aims to serve as a valuable reference for researchers and practitioners seeking to advance IRS technology in future wireless networks.

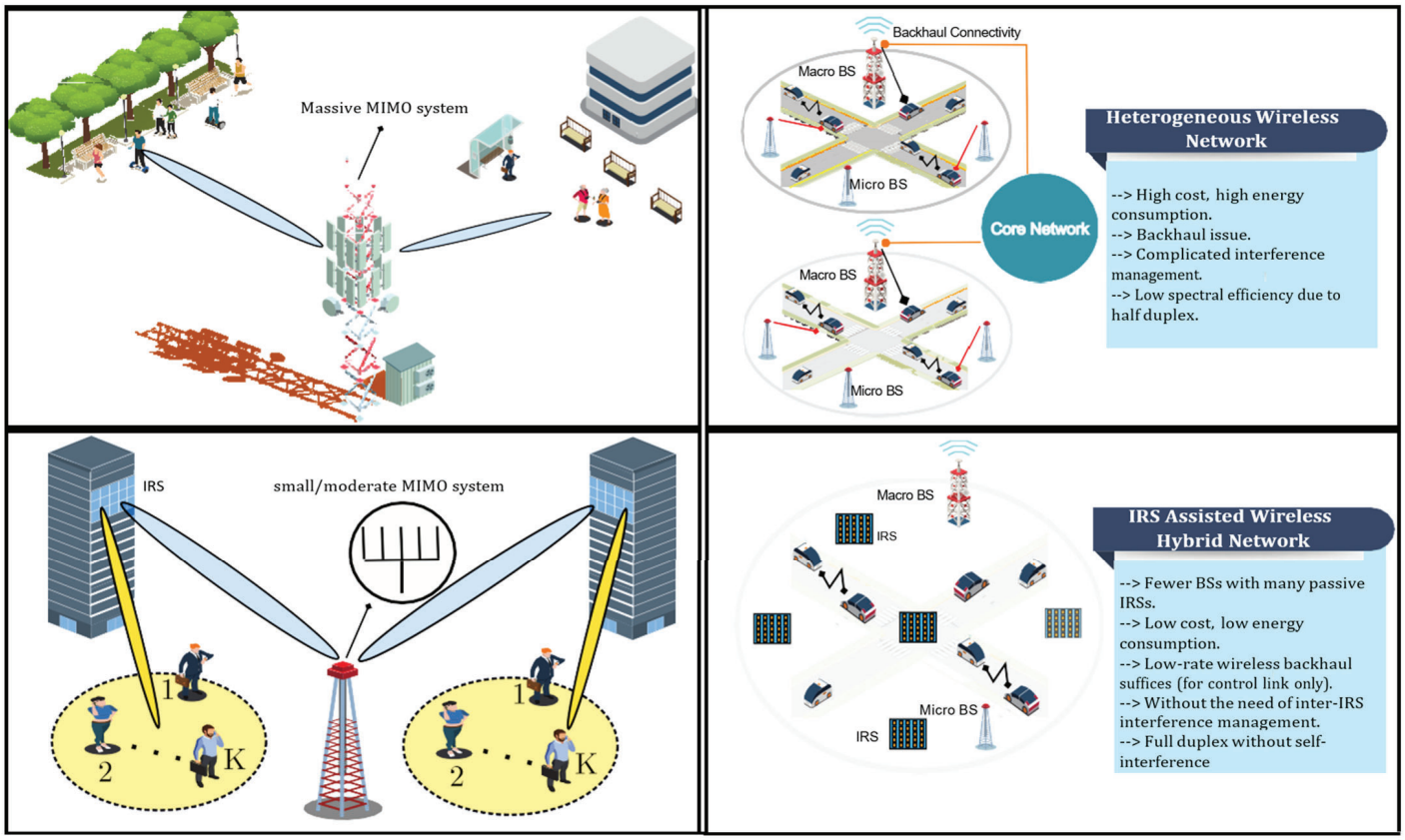


Fig: Key paradigm shifts of wireless network architecture using IRS

Biography

Adil Khan received his MS degree in electronics and communication engineering and Ph.D. degree in Electronic Science and Technology from Beijing University of Posts and Telecommunications, Beijing, China. He is currently an associate professor with the Department of Information Engineering at Xi'an Eurasia University. His research interests include the Intelligent reflecting surface, application of machine learning in wireless communication, performance analysis of UAV-enabled wireless networks, Mobile edge computing, and vehicular ad-hoc networks.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Application of Dry Grinding as an Optimisation Tool for the Surface Area Development in Geopolymer Cement Manufacturing

Zvikomborero Lazarus Duri[1], Rajesh Arora[1] and **Naveen BP[2]**

[1]Department of Mechanical and Electronic Engineering, Amity International University, Haryana, Gurgaon (Manesar), India

[2]Department of Civil Engineering, Amity International University, Haryana, Gurgaon (Manesar), India

Geopolymer materials have improved physical and chemical properties when adequately ground. A small hammer crusher was designed that crushes stones to produce very high surface areas required for optimised strength development in their dry state. The maximum feed size, moisture, blade clearances, blade numbers and blade speed were identified as key variables. Fineness of the output was measured for various crushing speeds and sieve sizes. Residues of the milled product were measured using a 90-micron sieve. The Dry grinding method was found to be 45% more efficient than the wet method. It was also observed that it requires less energy that the wet process. Overall research findings indicate that it is economic for both small scale and large-scale grinding for optimised particle size reduction of raw materials used in the manufacture of geopolymer cements.

Biography

Zvikomborero Lazarus Duri is a seasoned Process Engineer who has worked in various fields in the construction material manufacturing industry. He has experiences in rubber processing, plastics processing, electric cable manufacturing for both copper cables and overhead aluminium cables, asbestos cement pipes and sheets manufacturing, cement manufacturing, and gold processes redesigns. He is a pioneer Quality, Safety and Environmental Management Practitioner and holds a certificate in quality Assurance, City and Guilds and Diploma in Management. He has experience in heavy manufacturing gold processes, Power Plant Audits and Recommissioning. He is a fully trained Cement Professional by Lafarge Cement. He is also a Refractory Champion, and Alternative Fuels and Alternative Raw Materials Champion in Cement Manufacturing processes. He holds three patents related to Design of Large Scale Geopolymer Manufacturing System, Design of Fibre Reinforced Geopolymer Cement Bricks, and Design and Manufacture of a High-Speed Blade Dry Grinding Machine Tool for Improved surface Area development in Geopolymer Cements. This machine is also applicable to gold mining processes. He has installed at least five quality, environmental and safety management systems in different companies that have been successfully certified by various international certification bodies.

He has held various positions from Process Engineer, Quality Engineer, Quality Manger, Production Manager. Technical Manager -National Tyre Services (a division of Dunlop Tyres), Prodorite, William Smith and Gourock, BICC CAFCA, Turnall Fibre Cement, Lafarge Cement and Technology Centre Director at Harare Institute of Technology. I have over 32 years of industrial experience.

He is a current Acting Plant Director for a local Cement Plant.

Zvikomborero Lazarus Duri hold a Bachelor of Engineering in Industrial and manufacturing Engineering, and a Master's Degree in Manufacturing Engineering and Operations Management from the National University of Science and Technology (NUST) in Zimbabwe.

Now he is final year PhD scholar at Amity International University Haryana Campus, Gurgaon, India in Machine Design under the Department of Mechanical and Electronics Engineering (ASET).

He has presented papers at various international conferences in Egypt, Turkey, India and Zimbabwe.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Dependence of the Flowability of Fine Powders of Tool Steel on the Shape of Particles as Determined by the Method of Dynamic Image Analysis

Oleksandr Radchenko and **Kazbek Gogaev**

Frantsevich Institute for Problems of Material Science NAS of Ukraine, Ukraine

In various processes of chemical production, pharmaceutical and food technologies, mechanical engineering, agriculture, powder metallurgy, and additive technologies (mainly Powder Bed Fusion) where powder and granular materials are used, during dosing, mixing, filling into molds and other containers, as well as obtaining of a thin layer of powder, the ability of powders to flow is important. One of the main parameters on which the flowability of powders depends is the shape of the particles that make up the powder. 4 powders of high-speed steel grade P6M5K5 of different production methods were studied: powder 1 - spraying according to the usual mode of production; powder 2 – rolling of the fraction larger than 50 μm of powder 1, which had a significant number of particles with adhered satellites; powder 3 – spraying at high gas pressure; powder 4 – obtained by grinding the coarse fraction of powder 3. All powders were sieved through a 50 μm sieve. Arrays of shape factor values of shadow images obtained on the Bettersizer S3 Plus image analyzer were used for calculations. Pixel images were subjected to computer processing, obtaining parameters that allowed calculating the factors of the flat image of particles. 4 shape factors Circularity, Convexity, Solidity, Compactness, and 5 shape descriptors of an ellipse constructed using the Ferret diameter were obtained. The flowability of the powders was measured using a standard technique using a Hall funnel. The results of the calculation of the values of the shape factors of the powders and their flowability are given in the table. From the 1st to the 4th powder, the flowability decreased by 2.6 times (the flow time of 50 grams of powder increased from 22.49 to 58.81 seconds, respectively). At the same time, the Convexity factor changed the least (decreased by 2.2%), and the Compactness factor changed the most (decreased by 12%). Of the descriptors of the shape of the ellipse, it changed the least. Ellipse similarity (decreased by 6.6%), and Ellipse elongation changed the most (increased by 128.6%).

No of powder	Circularity	Convexity	Solidity	Compactness	Aspect ratio	Ellipse elongation	Ellipse similarity	Ellipse ratio	Eccentricity	Flowability s/50 g
1	0,91	0,93	0,97	0,89	0,92	0,07	0,90	0,93	0,30	22,49
2	0,89	0,93	0,96	0,86	0,88	0,11	0,89	0,89	0,39	30,38
3	0,89	0,93	0,96	0,89	0,89	0,07	0,90	0,93	0,30	23,10
4	0,84	0,91	0,94	0,79	0,79	0,16	0,84	0,84	0,49	58,81

Biography

Oleksandr Radchenko is a Doctor of Technical Sciences and a leading researcher in the department of "Dispersion of materials and plastic deformation by rolling" of the Institute for Problems of Materials Science named after I.N. Frantsevich NAS of Ukraine. The main scientific and practical activities are related to the study of the properties of powders and their relationships. His works laid the scientific foundations for the formation of multicomponent powder systems. Many works are devoted to the study of the laws of rolling and pressing powders. He has published more than 200 scientific papers, including more than 40 copyright certificates and patents. In 2011, he co-authored the book "Formation of Powder Systems" with Kazbek Gogaev. For the last 5 years, he has been developing technology for gas atomization of metal alloy powders for additive technologies.

Developments of Antibacterial Textiles: A New Horizon in Context of Hazardous Pollutant Degradation

Tanu Arefin[1] and **Monabbir Rafsan Fahim**[2]

[1]Department of Physics, Bangladesh University of Textiles, Bangladesh
[2]Department of Textile Engineering Management, Bangladesh University of Textiles, Bangladesh

Considering waste reduction as one of the major events today, this study revealed the surface modified Cotton and Flax fabrics *via* Silver Nanoparticles for the degradation of organic pollutants found in industry wastewater. In-situ synthesis was applied for the development of Ag-treated fabrics by dipping into the silver nitrate solution prepared by chemical reduction. The characterization *via* SEM revealed a good presence of AgNPs with average particle sizes of silver being 53.5 nm and 132.75 nm for silver treated Cotton and Flax fabrics respectively. Analysis of weight loss behavior showed lower thermal consistency for Fx-Alk-Ag fabric rather than Co-Alk-Ag. The bacterial resistance against E.coli recorded by ZOI value for Co-Alk-Ag and Fx-Alk-Ag were 12 mm and 10 mm respectively. The Co-Alk-Ag and Fx-Alk-Ag fabrics explored an outstanding degradation performance of Methylene Blue (MB) with 90.45 % and 99.37 % within 60 min without using any reducing agent that made them effective as adsorbents and photocatalysts. Prominent adsorption phenomena have been noticed in Flax fabrics rather than in Cotton fabrics. Linear fittings and R^2 values gave conclusive evidence that the Langmuir model is better suited for isotherm phenomenon in the treated fabrics than the Freundlich model. The adsorption phenomenon was evaluated using the Intraparticle Diffusion model where quick adsorption and continuous slow diffusion were found responsible for dye removal. According to these research results, Co-Alk-Ag and Fx-Alk-Ag would have a great opportunity in the degradation of textile pollutants as well as the antimicrobial properties of these composites.

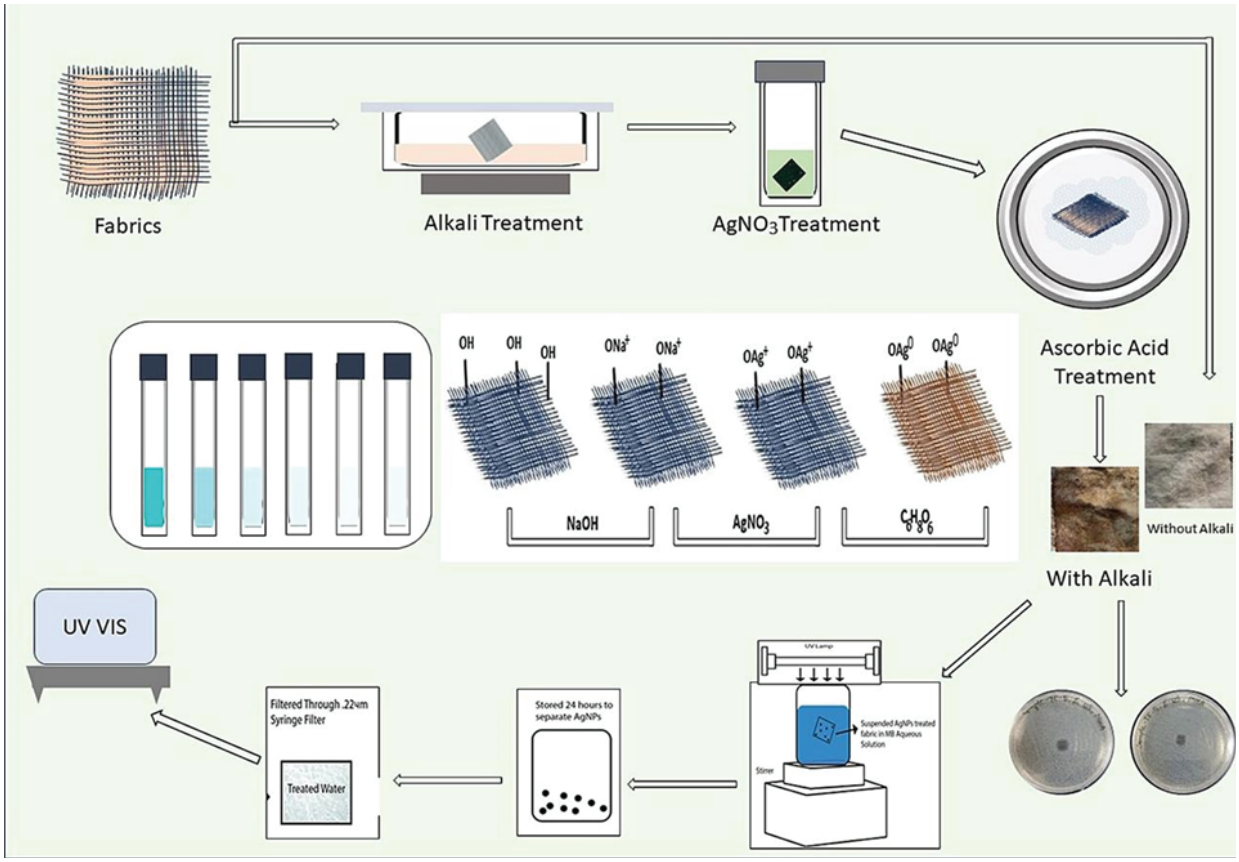


Fig: Graphical Representation of Degradation of MB from Aqueous Medium Using Anti-Bacterial Fabrics Loaded by AgNPs.

Biography

Dr. Tanu Arefin has completed her doctoral degree in Condensed Matter Nano Physics at Jahangirnagar University, where her research focused on the Development of Ag/ZnO nanoparticles: Coating fabrics and removing antibiotics addressing medical and environmental issues. Throughout her doctoral studies, she has gained a deep understanding of different types of nanoparticle synthesis methods and coating techniques on fabrics and the Advanced Oxidation process for removing antibiotics from an aqueous medium. Her research has been published in reputable journals. She has presented her work at several conferences, such as the 5th Edition of the Advanced Chemistry World Congress (Adv. Chemistry 2024), the International Conference on Science and Technology for Celebrating the Birth Centenary of Bangabandhu (ICSTB-2021) and BCSIR Congress 2019. Now she is working as an Associate Professor in the Department of Physics at Bangladesh University of Textiles. She has completed her M.Sc. and B.Sc. in Physics at Jahangirnagar University.

Bringing Cell Biology into Classroom: Tips to Culture and Observe Skeletal Muscle Cells in High School and College

Ryoichi Matsuda and **Fumiko Okiharu**

Department of Science Education, Tokyo University of Science, Japan

It is often difficult for high school students and teachers to observe live cultured cells because they need more expensive equipment such as inverted phase contrast microscopes and CO_2 incubators. Therefore, students and teachers often rely on textbook images of cells for learning, missing out on the experience of observing live cells firsthand. While commercially available smartphone microscopes work well for observing organisms like Euglena or planktons s, they may be less effective for viewing cultured cells. Using L-15 culture medium and flasks to culture cells without needing a CO_2 incubator is a fantastic initiative. Live cells can be observed with a standard upright microscope commonly found in high schools by simply inverting the culture flask.

Additionally, attaching a CD lens to a smartphone's selfie camera demonstrates that students can achieve cell observation and photography equivalent to an inverted phase contrast microscope. Students can now observe live cells grown in culture flasks at home using a smartphone microscope during their free time. These methods make conducting cellular biology studies in high schools much more feasible.

During my talk, I will provide the audience with CD lenses and stained cultured cell samples so you can use your smartphones to experience firsthand cellular observation at the single-cell level. These methods are simple enough that even elementary school students could easily observe live cells if provided with the necessary resources. By observing cells undergoing daily changes in morphology, proliferating cells, and even pulsating cardiac muscle cells, I am confident we can inspire scientific curiosity in the next generation. By seeing the real living cells for themselves, students can truly be inspired by the wonders of the natural world. "Study Nature not Books" (J.L.R. Agassiz 1807-1873) can come true.

Biography

- Born in 1952 in Yokohama, Japan
- B.A. 1976 Tokyo Metropolitan University
- M. Sc.1979 Chiba University, Graduate School of Biology
- D. Sc. 1982, Graduate School of Biology
- Postdoc. 1980-1983 University of California, Berkeley, Department of Zoology
- Assistant Professor 1983-1988 Tokyo Metropolitan University
- Senior Scientist 1988-1991 The W. Alton Jones Cell Science Center, Lake Placid, NY
- Associate/Full Professor 1991-2018 The University of Tokyo
- Full Professor 2018-2023 Tokyo University of Science
- Professor Emeritus 2018 The University of Tokyo
- Visiting Professor 2023- Tokyo University of Science
- Chairman of the International Biology Olympiad 2018-2022

His notable publications include:

Matsuda, R. et al. (1995). Visualization of dystrophic muscle fibers in mdx mouse by vital staining with Evans blue: evidence of apoptosis in dystrophin-deficient muscle. Journal of Biochemistry, 118, 959-963. https://doi.org/10.1093/jb/118.5.959

Ryoichi Matsuda, Fumiko Okiharu. Bringing cell biology into the classroom: tips to culture and observe skeletal muscle cells in high school and college. *In Vitro* Cellular and Developmental Biology-Animal. https://doi.org/10.1007/s11626-024-00906

Wada E, Hamano T, Matsui I, Yoshida M, Hayashi YK, Matsuda R. (2019). Renal involvement in the pathogenesis of mineral and bone disorder in dystrophin-deficient mdx mouse. The Journal of Physiological Sciences, 69(4), 661-671.

Masaki Tsuchiya et al. (2018). Cell surface flip-flop of phosphatidylserine is critical for PIEZO1-mediated myotube formation. Nature Communications. https://doi.org/10.1038/s41467-018-04436-w

Mitsuru Sasaki-Honda et al. (2018). A patient-derived iPSC model revealed oxidative stress increases facioscapulohumeral muscular dystrophy-causative DUX4. Human Molecular Genetics, 27(23), 4024-4035.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Recent Advances on Plant-Based Acid-Base Indicators

Germildo Juvenal Muchave[1,2], Chalosse João Raimundo[3], Neuana Fernando Neuana[3,5], Célio Matias Airone Macalia[3,4], Domingos Lusitâneo Pier Macuvele[3,6] and **Taualia Achira Aly[3]**

[1]Department of Research, ISCED Open University (UnISCED), Mozambique
[2]Universidade Federal do Rio de Janeiro, Brazil
[3]Department of Science, University of Rovuma, Mozambique
[4]PPGCEM, Universidade Federal de Amazonas, Brazil
[5]Federal de Santa Catarina, Brazil
[6]Departamento de Engenharia Química e de Alimentos; Universidade Federal de Santa Catarina, Brazil

Modern societies face diverse concerns. These concerns include environmental issues. For these reasons, all production fields make their processes ecological and sustainable. In general, synthetic acid-base indicators are efficient in various chemical applications. However, there are environmental concerns to reduce the consequences of toxic compounds. In recent years, plant-based acid-base indicators have emerged in the literature as a solution to address these concerns. Despite these advances in research into applying plant extracts as environmentally friendly acid-base indicators, some fundamental challenges must be addressed to accelerate the development of standardized acid-base indicators from these extracts. Some of these challenges refer to identifying new plants that can be tested as potential acid-base indicators and deepening research on the determination, stability and mechanical aspects of pKa of the few plants currently identified. In this context, this work aims to report the latest advances in green acid-base indicators, highlighting the role of Mozambican plants focusing on determining pKa and application in acid-base titration. Euclea natalensis root extracts were obtained by heating at 60°C for 1h in water and applied for acid-base titration. The pKa value was determined and compared to bromothymol blue and methyl orange, conventional acid-base

indicators. The pKa of naphthoquinones previously identified in the root of Euclea natalensis was predicted using a web server, MolGpKa and compared with the experimental pKa value. The results obtained in the present study reveal that aqueous extracts of Euclea natalensis are very promising and have high potential as synthetic and standard acid-base indicators. The best performance of the extract based on the pKa value is in the strong acid-base titration. Therefore, the extract has the potential to be a green and locally available acid-base indicator. However, additional work is still needed to understand the stability and which compound, or compounds are the core of the color change.

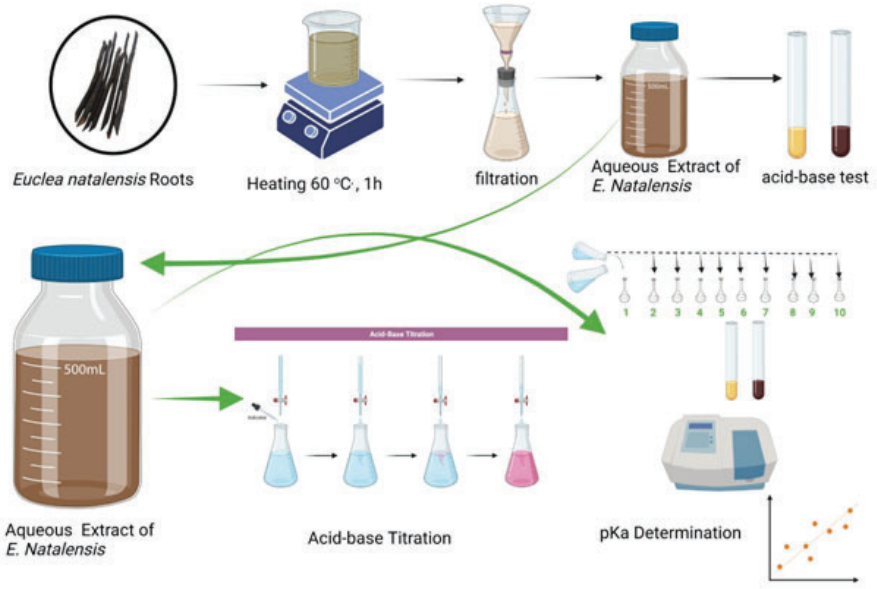


Fig: Schematic illustration of the main steps followed in this work

Biography

Germildo Juvenal Muchave, Mozambican, Coordinator of the Research Centre at the Open University ISCED, Mozambique. He has a degree in Chemistry from UP-Mozambique, a Master's and PhD in Chemical and Biochemical Process Engineering with an emphasis on Catalysis and Reactors from the Federal University of Rio de Janeiro (UFRJ) - Brazil and a Post-doctorate in Chemical Engineering with a focus on Chemical Technology, Petroleum and Petrochemistry, from the UFRJ - Brazil. Germildo has experience in the areas of Chemistry and Chemical Engineering, with an emphasis on Catalysis, Kinetics, Green Chemistry, Valorization of biomass, Alternative and Renewable Energy Sources, Petroleum Chemistry and its derivatives, Biofuel and Bioproduct Production Technologies (aviation biokerosene and green diesel, bio gasoline, biodiesel, fatty alcohols). Currently, he works with applied research in the production of hydrogen through the reforming of ethanol and natural gas, synthesis of green hydroxyapatite (through extracts from local plants), valorization of biomass and waste.

Wiener Sausage and Particle Collision Frequency Factor

Lyakishev Vladislav[1] and **Perfileev Mikhail**[2]

[1]Irkutsk State University, Russia
[2]International Academy of Natural History, Russia

In this paper, for the first time, the Wiener sausage (which is a non-Markovian Brownian motion functional) is applied to the field of chemical kinetics. Using the Wiener sausage, probability theory and mathematical analysis, the collision probability of two reactant particles moving along Brownian trajectories in an inert medium is estimated. Then the transition to a set of particles is carried out and a new formula for the collision frequency factor of particles moving in an inert liquid or gas medium is obtained. The obtained formula contains three summands, has a deep physical meaning and by value exceeds all known to the world science formulas for the frequency factor in the Arrhenius equation and its modifications. Thus, the results obtained in this work are very relevant for chemical kinetics and physical chemistry in general.

Biography

Lyakishev Vladislav Konstantinovich was born on November 14, 2002 in Irkutsk. Studied at high school (lyceum №47) in Irkutsk from 2008 to 2020. From 2020 to 2021 studied at MSTUCA. From 2021 to 2025 he studied at the Department of Chemistry at ISU. Since 10th grade he started writing scientific articles with Mikhail Sergeevich Perfileev, doctor of the International Academy of Natural Sciences, PhD in mathematics. He is one of the top 150 living mathematicians according to Clay State University. He has been awarded 2 Euler and Lomonosov medals for his achievements in mathematics. In 2016 he solved the Millennium Problem (Riemann Hypothesis) and in 2024 he solved the Brocard Problem.

Below are all the articles (there are 11 so far, including this one):

1. Software for calculating the degree of ionicity and polarity of chemical bonding in binary compounds.
2. Estimation of the maximum ionic strength of a solution.
3. Resonant wave contribution to chemical kinetics.

4. Calculation of the diameter of a hydrogen molecule within the framework of classical electrodynamics.
5. Improvement of the model of the hydrogen molecule as a spherical capacitor.
6. Positronium molecule geometric model in the context of the Hopf link.
7. Computer verification of the positronium molecule model as a two tori Hopf link.
8. Quantum model of anharmonic vibrations of a diatomic molecule with a variable force constant and a small value of the anharmonicity coefficient.
9. Theorem on rates of alignment of electronegativities of atoms in the process of formation of a chemical bond in a binary molecule.
10. Mathematical modeling of changes in electrical potential energy during the formation of covalent polar and ionic chemical bonds in a two-atomic molecule.
11. Wiener sausage and particle collision frequency factor.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Two-Dimensional MOF–Based Materials: Preparations and Applications as Electrodes in Li-ion Batteries

Narges Nobakht[1,2], Seyyed Ahmad Etghani[1], Mohammad Hosseini[1] and **Seyed Hamed Aboutalebi[1]**

[1]Condensed Matter National Laboratory, Institute for Research in Fundamental Sciences (IPM), Iran
[2]BattScout Company, UK

Two-dimensional (2D) metal-organic frameworks (MOFs) are rapidly emerging as a unique class of mushrooming family of 2D materials offering distinctive features, such as hierarchical porosity, extensive surface area, easily available active sites, and versatile, adaptable structures. These promising characteristics have positioned them as highly appealing alternatives for a wide range of applications in energy storage technologies, including Lithium batteries. Nevertheless, the poor conductivity and limited stability of 2D MOFs have limited their real applications in electrochemical energy storage. These limitations have therefore warranted ongoing research to enhance the performance of 2D MOFs. Given the significance of 2D MOF-based materials as an emerging class of advanced materials, a multitude of strategies have been devised to address these challenges such as synthesizing 2D conductive MOFs and derivatives along with 2D MOF hybridization. One promising approach involves the use of 2D MOF derivatives, including transition metal oxides, which due to their abundant unsaturated active metal sites and shorter diffusion paths, offer superior electrochemical performance. Additionally, by combining pristine 2D MOFs with other materials, hybrid 2D MOF materials can be created. These hybrids, with their enhanced stability and conductivity, can be directly utilized as active materials in lithium batteries. In the present review, we categorize 2D MOF-based materials into three distinct groups: pristine 2D MOFs, 2D MOF-derived materials, and 2D MOF hybrid materials. The synthesis methods for each group, along with their specific applications as electrode materials in lithium-ion batteries, are discussed in detail. This comprehensive review provides insights into the potential of 2D MOFs while highlighting the opportunities and challenges that are present in this evolving field.

Biography

Narges Nobakht works as an associate prof. in Condensed Matter National Laboratory of Institute for Research in Fundamental Sciences (IPM), with a Doctor of Philosophy (PhD) focused in nano chemistry. She is co-founder of BattScout, an independent battery consulting start-up company specialized in researching and analyzing scientific and patent information in materials science and energy storage. Her current research interests are focused on synthesis and design of metal organic frameworks and new 2D materials for biological and energy applications.

Novel Preparation of p-Sb_2O_3: CuO/n-Si Solar Cell: Improvement in Efficiency as a Function of Thickness

Khalid Haneen Abass, Ali A. Attia, Fouad Sh. Hashim and **Khalid Alammar**

Department of Physics, College of Education for Pure Sciences, University of Babylon, Iraq

Antimony trioxide (Sb_2O_3) exhibits unique physical and chemical properties, rendering it beneficial in various device applications, such as solar cells. Nanofilms of pure and Sb_2O_3:0.06wt.% CuO was successfully prepared on silicon substrates etched by laser utilizing a thermal evaporation process under a vacuum atmosphere with various thicknesses of approximately (20, 30, and 40 nm). X-ray diffraction examination of the formed nanofilms shows no characteristic patterns. The peak broadens due to the absence of long-range symmetry. The nanocrystalline structure consequently becomes disordered. According to scanning electron microscopy (SEM), the produced nanofilms had a uniform, smooth surface, and free of islets and gaps. The particles were all about the same size, and the new structures were created with a thickness of 40 nm. AFM analysis showed homogeneous surface morphology in the nanofilms, which exhibited a granular shape. The optical energy gap decreased with increasing thicknesses of pure nanofilms and Sb_2O_3:0.06wt.% CuO. The Wemple–DiDomenico-derived energy gap value was comparable to that calculated from the Tauc relation. The significant improvement in solar cell efficiency is shown by the results obtained at 40 nm, where the conversion efficiency (η) is about 5.965% for Sb_2O_3 and 7.625% for Sb_2O_3:0.06wt.% CuO nanofilms.

Biography

- Professor Khalid Haneen Abass, Ph.D
- Affiliation: University of Babylon, College of Education for Pure Sciences, Department of Physics.
- Mobile phone no.: Viber, WhatsApp: +964 7802565767
- E-mail: pure.khalid.haneen@uobabylon.edu.iq

Academic Background:

- Ph.D. in Nano-material Physics from the University of Al-Mustansiriyah, Baghdad, Iraq.

Research Contributions:

- Published over 100 research papers in international journals.
- Contributed to five conferences outside Iraq.
- Participated in more than 40 conferences within Iraq.

Certifications:

- Received over 10 certificates from Elsevier Publishing Campus webinars.

Patents:

- Novel preparation of antireflection film from Ai-Ni-Cr alloy (2013)
- Novel Preparation of Solar Cell from MgO-doped TiO2 Deposited on Silicon Substrate by PLD Method (2016)
- Novel Preparation of a Solar Cell from ZnO Doped with Aluminum and Deposited on a Silicon Substrate by Thermal Evaporation (2018)

Supervision Experience:

- Supervised three Ph.D. students outside Iraq.
- Supervised five Ph.D. and thirteen M.S. students within Iraq.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

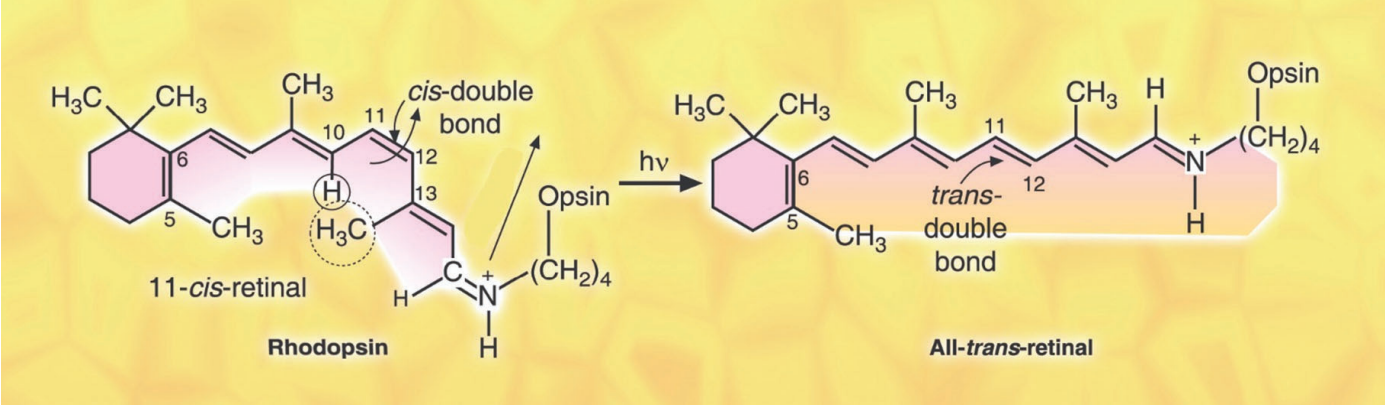
Photochemistry of the Retinal Chromophore in the Process of Seeing (Vision)

Ruhi Das[3], Udita Das[1], Ankita Das[2] and **Asim K. Das[1]**

[1]DST INSPIRE Scholar, PG (Department of Chemistry), Visva Bharati University, India
[2]DST INSPIRE Research Fellow, School of Chemical Sciences, Indian Association of Cultivation for the Science (IACS), India
[3]Department of Chemistry, Bolpur College, Burdwan University, India

Vision process is a complex biochemical process that involves the participation of two types of retinal photoreceptor cells: rod cells and cone cells. These visual pigments possess the chromophore, 11-cis-retinal, linked through a Schiff base linkage to the opsin protein. Absorption of light by the visual pigment leads to the photoexcitation followed by photoisomerization, 11-cis-retinal (Z) to all-trans-retinal (E) for the activation of transducing, a heterotrimeric G-protein, to generate a nerve signal that is transmitted to the brain to produce the sense of vision. The photoisomerized pigment undergoes rapid hydrolysis to produce the opsin protein and all-trans-retinal that can be reconverted enzymatically to 11-cis-retinal for recharging the opsin protein to regenerate the active visual pigment to maintain the Wald's visual cycle.

The visual Schiff base pigments rhodopsin and photopsins in rod and cone photoreceptor cells respectively isomerize the chromophore, 11-cis-retinal (Z) to all-trans-retinal (E) configuration upon absorption of photons. This isomerization process of the chromophore associated with a conformational change in the tertiary structure of the protein of the visual pigment is responsible for the activation of transducing, a heterotrimeric G-protein, to generate the visual nerve signal transmitted to brain for translation. After photoisomerization responsible for the generation of visual nerve signal, the photoexcited pigment undergoes rapid hydrolysis to produce the opsin protein and all-trans-retinal that subsequently isomerizes to 11-*cis*-retinal to regenerate the visual pigments in Wald's visual cycle.



Biography

Sl. No.	Subject contains	No. of Events/Programme/Publication etc.
1	Academic qualification	MP (1stDivision), HS (1stDivision.), B.Sc. (1st Class), M.Sc. (1st Class), CSIR-NET (All over India Rank 69), GATE, Ph.D.
2	Honors & Awards	National Scholarship Award
3	Teaching experience	(i) More than Nine years in under graduate level at Bolpur College
		(ii) More than five years in Integrated M.Sc. level as a Guest Faculty at Visva-Bharati University
4	List of Publication	9
5	List of Book Chapters	3
6	List of Papers presented in the Seminar/ Conference/Symposium	11
7	Seminar/Webinar Attended	24
8	Refresher Course, Orientation Course	3
9	Orientation programme, Short-Term Course, Faculty development Programme, Workshop, Winter Camp & Add-On Course Attended	21
10	Appointed as Internal/External Examiner / Scrutinizer	71
11	Completed Certificate course on Hindi	1
12	Performed all assigned job like administrative, academic etc. efficiently	
13	Actively coordinated and participated in various activities for our college	

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Adobe Improvement Proposal using Cassava (Manihot Esculenta) as a Stabilizer Applied to Luena-Moxico-Angola

Daniela Gourgel Malamba[1], Antonia Dorzan Norman[1] and **Antonio Olímpio Gonçalves[2]**

[1]Instituto Superior Politécnico de Tecnologias e Ciências - ISPTEC, Angola
[2]Faculdade de Ciências da Universidade Agostinho Neto - FACUAN, Angola

The present research consists of the study of earth construction techniques, specifically Adobe, aiming to improve its performance in compression and humidity, with the application of low-cost local material, as stabilizer. The research was carried out in the small village named Sacassanje, at Luena City, in Moxico province. The houses in the village are mainly in Adobe and unfortunately, they have a short lifetime that leads to constant rebuild of them. Earth/Soil as an anisotropic material, does not always have suitable characteristics for earth construction. Studies on the subject led to the development of soil stabilization methods, which promote the improvement of some properties. Cassava, a local, accessible and low-cost product, was chosen as the stabilizer to be used. The work had begun with the characterization of the village soil, through in-situ and laboratory tests, where it was possible to identify the composition of the soil and other parameters. The found results served as a basis for comparison and evaluation of soil's quality. The research presented the study of the Cassava and how adobe behave on both cases (plain and stabilized) in terms of resistance to compression (Illustration 1) and water absorption (Illustration 2).

The results obtained in the soil's characterization shows that it doesn't have a suitable granulometric distribution. From the tests carried out on the samples, it was found that the stabilized adobe presented better performance comparing to the non-stabilized adobes. These results indicate that the use of cassava is effective in stabilizing the soil in the region, functioning as a binding element and thus improving the final properties of the adobe. In summary, the use of this stabilizer is viable and objectively meets the need of the population as well as the technical standards governing earthen constructions.

Illustration 1- Compression Resistance Test Results

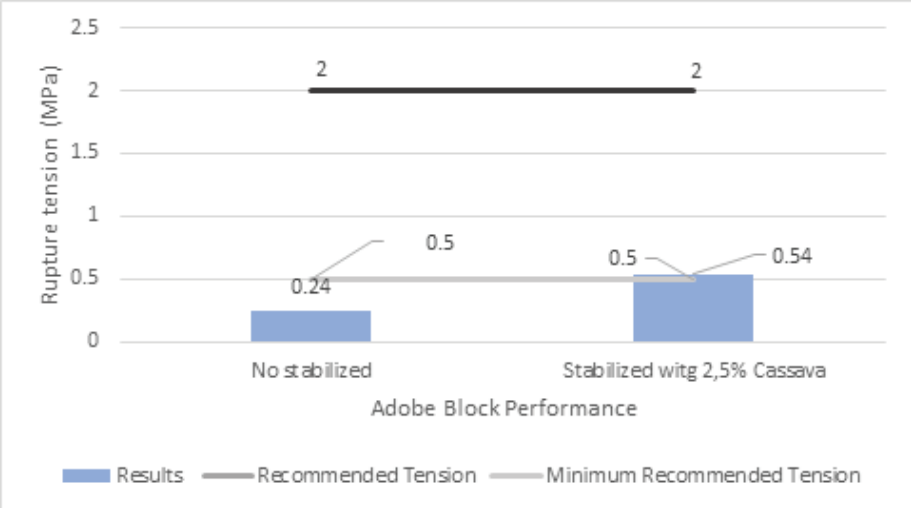


Illustration 2- 3.1 Water absorption test by capillarity

Test Time: a) 13h:14; b) 13h:17; c) 13h:37 e d) 14h:16

Biography

Daniela Malamba is a Civil Engineer, graduated from ISPTEC, Angolan University, on 2021. From her academic journey she highlights her participation in Engineering for Sustainable Development Fair, where her group and she presented their thought on how Topography can be applied to reduce Desertification and Drying on South of Country.

In 2021 she has started her professional journey working as Project Engineer in a Road Project at Mota-Engil Company. The project consisted on refurbish the road to provide safer and faster trips from country West side to East, allowing better essential resources distribution to further cities.

Daniela worked there for 2 years and she had opportunity to grow her capabilities and also build her professional profile. More than that, it was really amazing working on a project that improve the life of people.

In August 2023, she has embraced the opportunity to make an internship on Oil and Gas Industry. So far, she has been learning a lot and working as field engineer. Her job responsibility includes provide technical solutions to engineering problems.

She has a great journey and she hope to have the chance to keep growing professionally and contribute through her job to development of her country.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Management Risk Factors and Associated Causes of Traffic Accidents in Arbil City, Kurdistan - Iraq

Muhsen Kamal Yasen

University of Kurdistan Hewler, Iraq

Traffic accidents are a contributing factor to any loss of life, property, or services. It happens when a car runs into another car or something else. Certain elements will manifest, resulting in harm and potentially preventable incidents, and reduced by using the right strategies. These losses came from lower production and recovery costs. This study aimed to know management risk factors and associated causes of traffic accidents in Arbil city.

This perspective-based study was conducted from January 2008 to December 2023, at Arbil City, Iraq, and all data was calculated by (NIMS). Data was collected and calculated until August 2020 after that some of the cases were not included and collected due to the COVID-19 lockdown.

A total of 41669 traffic cases were recorded during 2008-2023. A high prevalence was found in 2023, and 2022 accounted for 4769 (11.44%), and 4613 (11.07%). While low prevalence was seen in 2012, 2015, 2016, 2014, 2018, 2017, 2021, 2020, 2011, and 2010 years accounted 3320 (7.96%), 3119 (7.47%), 3087 (7.40%), 3066 (7.35%), 3008 (7.21%), 2999 (7.19%), 2871 (6.89%), 2485 (5.96%), 2104 (5.04%), 1943 (4.66%), 1295 (3.10%), 1253 (3%), 1023 (2.45%), and 714 (1.71%) respectively. Among all accidents with high prevalence were crashes 33149 (79.66%), 4343 (10.42%), 3182 (7.63%), bicycles 902 (2.16%), and 85 (0.20%).

Human conduct is linked to a high rate of traffic accidents leading to injuries and fatalities. Road accidents have become a significant public health hazard. A new technique for reducing the occurrence of this issue is required.

Biography

Education & Professional Background:

Dr. Muhsen Kamal Yasen was born in Erbil, Iraqi Kurdistan Region, in 1975. He holds an M.B.Ch.B degree from the College of Science at Polytechnic University in Erbil (2017) and a Ph.D. in Business and Management from University Kurdistan Hawler (2021).

Specialized Expertise:

Dr. Yasen has established himself as a distinguished figure in Business and Management, with particular expertise in the management and planning of mass grave investigations and analysis of conflict incidents in the Kurdistan region. His interdisciplinary approach combines business administration principles with specialized forensic applications.

Additional Training & Qualifications:

In addition to his formal academic credentials, Dr. Yasen has received specialized training in Forensic Medicine and Forensic Anthropology to support his research endeavors.

Research Contributions:

Dr. Yasen has authored 10 research papers published in various high-impact journals with Scopus indexing and DOI registration. His work has garnered 22 citations and an h-index of 5, reflecting the significance of his contributions to his field.

Humanitarian Service:

During the conflict with ISIS, Dr. Yasen demonstrated remarkable dedication by volunteering his professional expertise alongside Peshmerga forces for over four years. His fieldwork on battlefields applied his specialized knowledge in critical humanitarian contexts.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Evaluation of Alkaline Proteases from Rose Snapper (*Lutjanus guttatus*) to their Stability to Chemical Denaturants

Gabriela Miranda Pedroza-Toledo[1], Gissel Daniela Rios-Herrera[2,4], Jesús Aaron Salazar-Leyva[3], Idalia Osuna-Ruiz[3], Jorge Manuel Sandoval-Gallardo[4] and **Emmanuel Martínez-Montaño[3,5]**

[1]Ingeniería en Biotecnología, Universidad Politécnica de Sinaloa (UPSIN), México
[2]Estancias Postdoctorales por, CONAHCyT/UPSIN, México
[3]Maestría en Ciencias Aplicadas, Unidad Académica de Ingeniería en Biotecnología, Universidad Politécnica de Sinaloa (UPSIN), Mexico
[4]Facultad de Ingeniería y Tecnología, Universidad Autonom de Sinaloa, Ave. Universidad S/N Ciudad Universitaria, México
[5]Investigadores Por México CONAHCyT, Consejo Nacional de Humanidades, Ciencia y Tecnología, México

The spotted rose snapper (*Lutjanus guttatus*) is a commercially significant fish species in Mexico. Its processing generates a substantial amount of waste that can be harnessed to transform it into by-products with added value. Among these waste materials, viscera constitute 20% of the total organism weight and serve as a rich source of proteases that can be utilized for various industrial applications. Therefore, the objective of this study was the biochemical characterization of intestinal proteases from the spotted rose snapper. The semi-purified intestinal proteases (ED) extract was obtained through precipitation with 30% and 70% ammonium sulfate saturation, followed by dialysis to eliminate excess salts and low molecular weight proteins. The soluble protein content and total proteolytic activity of *L. guttatus* and the evaluation of their stability against different chemical denaturants (salts, surfactants/reducing agents, organic solvents, and commercial detergent formulations). The APE exhibited maximum activity at pH 12 and 45°C and high stability at pH and temperature ranges from 9 to 12 and 10 to 40°C, respectively. Assays with specific protease inhibitors indicated that trypsin and chymotrypsin are the main types of proteases in APE. An 80% of the proteolytic activity was retained in the presence

of 25% NaCl and was stable in the presence of the reducing agent DTT; however, it lost around 70% of proteolytic activity in the presence of 2-mercaptoethanol. The enzymatic activity of APE was maintained above 60% in methanol, ethanol, and propanol as well as in liquid commercial detergents. These results show intestinal proteases possess catalytic characteristics that endow them with industrial application potential through various biotechnological approaches.

Biography

Gabriela Miranda Pedroza Toledo is a Biotechnology Engineering professional of 23 years old with experience in quality control in both the oil and shrimp industries. Fluent in Spanish, English, and French with proficiency in Thai, Portuguese and German at a conversational level. She worked on the Evaluation of Alkaline Proteases from the Rose Snapper project for over a year, where she applied her biotechnological knowledge to industry-specific challenges. She also had the opportunity to attend the Delfin Scientific Summer Program, which helped expand her research skills. Gabriela personal belief is the power of global collaboration and cultural exchange and her diverse background in biotechnology drives her approach to problem-solving in the field.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Nano-Emulsified Formulation of *Mentha Piperita* Essential Oil: Development, *in vitro* and *in silico* Assessment Against Diamondback Moth, *Plutella Xylostella* (L.) (Lepidoptera: Plutellidae)

Ankur[1], Nida[2], Rupom Pathori[2], Narender Singh[3], Sanjiv Mullick[2] and Alka Gupta[1]

[1]Department of Chemistry, Dyal Singh College, University of Delhi, India
[2]Department of Zoology, Dyal Singh College, University of Delhi, India
[3]Department of Chemistry and Biochemistry, Sharda University, India

Pesticides are chemicals that manage pests. Since they control disease vectors and crop pests, they are crucial to healthcare and agriculture. However, human health issues, significant environmental toxicity, and pest resistance restrict the development and use of pesticides. Hence, there is a compulsive demand to shift from conventional chemical pesticides to eco-friendly pest management strategies. Essential oils (EOs) extracted from plants with their complex mechanism of action are considered potential candidates for environmentally safer 'green pesticides'. Despite the huge versatility of EOs, their application is limited due to lower stability and poor water solubility. The intervention of nanotechnology can be a promising solution to overcome these drawbacks. This research aims to develop the nano-emulsified formulations loaded with *Mentha piperita* EO and its *in vitro* and *in silico* assessment against the destructive pest diamondback moth, *Plutella xylostella*. Peppermint EO was extracted using a hydro-distillation technique and subjected to Gas chromatography coupled with mass spectrometry (GCMS) to identify the constituents of EO. The spontaneous emulsification method was used to develop nanoformulations using a non-ionic emulsifier Tween 80. The obtained formulations were optimized for their stability by monitoring hydrodynamic diameter and polydispersity index (PDI) using Dynamic light scattering (DLS), centrifugal stability, and oil loading assessment studies. Transmission electron microscopy (TEM) was used to further assess the morphology of the obtained nano-emulsified formulation. The nanoformulations showed significant ovicidal and antifeedant activity in a laboratory bioassay. Based on GCMS data, six major components were selected and investigated against the Ryanodine Receptors (RyRs) SPRY2 of *P. xylostella* using molecular docking

studies and promising docking scores were obtained. Thus, nano-emulsified formulations loaded with peppermint EO can be a viable option to be used as a green pesticide for the management of *P. xylostella* to boost agricultural output.

Biography

Mr. Ankur has done his B.Sc. (Hons.) in Chemistry and M.Sc. with a specialization in Organic Chemistry from the Department of Chemistry, University of Delhi. He received a Junior and Senior Research Fellowship funded by CSIR New Delhi, India (2019-2024). Currently pursuing a Ph.D. in Chemistry in the interdisciplinary field of Nano-biopesticide. His research focuses on the development of nano-biopesticides and the evaluation of their efficacy against lepidopteran insect pests. Mr. Ankur has presented his research work at various international conferences and symposiums in both India and abroad and recently won a Best Oral Presentation award at the International Conference on Advances in Chemical and Applied Sciences for Sustainable Development (ACASSD-2024), 29th-30th March 2024, Organized by JECRC University, India. His research work has also been published in various journals of international repute.

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Effect of H_2S Gas Flow Rate on the Stoichiometric Ratio of S:Zn and Transparency of ZnS Nanostructure Ceramic in IR Region

Saeed Zahabi[1], Mohammadreza Hesabi[2], Mohammad Reza Loghman Estarki[1], Saeed Hosseinzadeh[1], Hossein Jamali[1], Amin Ashkian[1], Shahram Alirezaee[1] and **Shahab Torkian[1]**

[1]Department of Materials Engineering, Malek Ashtar University of Technology, Iran
[2]Department of Materials Engineering, Semnan University, Iran

So far, extensive research has been performed on multi-crystalline transparent ceramics with infrared (IR) transmission. Zinc sulfide (ZnS) is the most famous semiconductor of groups II–VI within the wavelength range of 8–14 µm, which is a desired option for IR transparent ceramics, and is used in different applications including night vision cameras, airplane, and satellites domes. In this research, zinc sulfide (ZnS) nanostructure powder was successfully synthesized *via* two-stage annealing (Ar + H_2S). The annealing under argon medium was responsible for eliminating impurities such as SO_4, SO_3 and SO_2. The annealing under Hydrogen Sulfide (H_2S) medium also led to compensation of sulfur and establishment of Zn to S stoichiometric ratio following sintering. Investigation of different flow rates of H_2S gas indicated that 30 mL/min would contribute to optimal Zn to S stoichiometric ratio. The Zn to S stoichiometric ratio before sintering under H_2S medium was 1.28, which increased to 1.55 after annealing under H_2S medium. The ceramic obtained from ZnS powder annealed under H_2S medium at 30 mL/min had density of 99.98% and IR transmission of 62% within 8–12 µm range (wavenumbers of 1250–850 cm^{-1}.

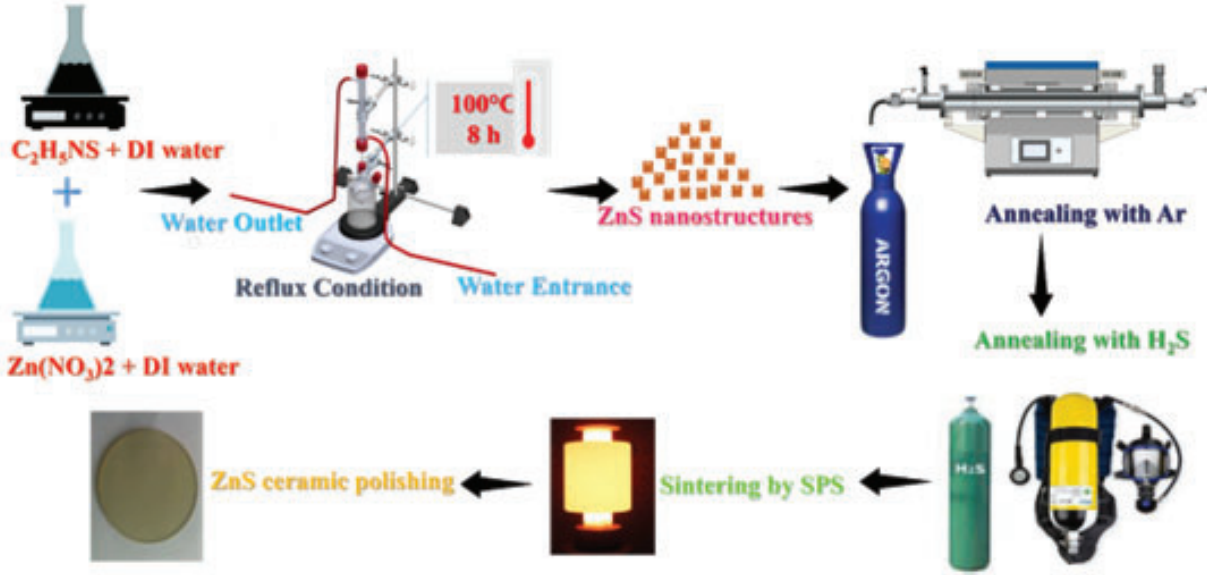


Fig: Schematics of the process of ZnS nanostructure transparent ceramic manufacturing

Biography

EDUCATION

M.Sc. in Nanotechnology, Nanomaterial Engineering **2018 - 2020**

Malek Ashtar University of Technology, Shahinshahr, Isfahan, Iran

GPA: 18.70/20

Thesis Topic: Effect of annealing atmosphere and Zn:S ratio on the microstructure and transparency of ZnS nanostructured ceramics in the IR region. (Thesis Grade: excellent)

Advisor: Dr. Mohammadreza Loghman Estarki

B.Sc. in metallurgy Engineering **2014 - 2018**

Mohajer Technical and Vocational College of Isfahan, Isfahan, Iran

GPA: 17.50/20

HONORS & AWARDS

- Ranked as the best research assistant in Nanomaterial Engineering Department, Malek Ashtar University of Technology, Shahinshahr, Esfahan, Iran, 2020 and 2022
- Ranked as the first top student among 4 students of Nanomaterial Engineering at the end of Master's degree, Malek Ashtar University of Technology, Shahinshahr, Isfahan, Iran, 2020.
- Tuition fully waived for Master's Degree, 2018 – 2020
- Ranked in the top 20% among more than 1000 participants in the Iranian university entrance exam for Master's degree in Nanomaterial Engineering, 2018
- Ranked as the first top student among 36 students of Metallurgy Engineering at the end of Bachelor's degree, Mohajer Technical and Vocational College of Isfahan, Isfahan, Iran, 2018

- Tuition fully waived for Bachelor's Degree, 2014 – 2018
- Accepted as the 20 top researchers in Nano Site, 2015-2017
- Ranked 20th among more than 10000 participants in the Iranian university entrance exam (Technical and Vocational Exam) for Bachelor's degree in Metallurgy Engineering, 2014
- Achieved 175 credits in Khwarizmi Youth Awards, 2012.

SELECTED PROJECTS

- Development of Cf-SIC composite for using in brake discs, Malek Ashtar University of Technology, Isfahan, 2023.
- Development of magnetically behavior of Mumetal alloy for using in magnetic shielding, Malek Ashtar University of Technology, Isfahan, 2022.
- Investigation and fabrication the joining of different non-homogeneous materials by SPS method, Malek Ashtar University of Technology, Isfahan, 2021.
- Investigating and fabrication infrared windows with Zinc Sulphide nanostructure by Hot press and SPS method, Malek Ashtar University of Technology, Isfahan, 2020.
- Investigation and fabrication of YSZ heat barrier coating by spray dryer method, Malek Ashtar University of Technology, Isfahan, 2019.

WORK EXPERIENCE

- Research Assistant
- Malek Ashtar University of Technology
- Feb. 2020 – Present
- R & D
- Nanofaraz Sepahan Company, Isfahan, Iran
- Sep. 2018 – Mar. 2019

6th Edition of

Advanced Chemistry World Congress

March 27-28, 2025 | London, UK

Towards the Understanding of Precipitation Evolution in Two-Phase Steel: Application of a Novel Computational Model to Grain-Oriented Electrical Steel

Vanessa Quaranta[1], Lucas Traina[1], Mikhail Ryazanov[2] and **Denis Saraev[1]**

[1]R&D Department, NLMK Group, Belgium
[2]R&D Department, NLMK Group, Russia

Grain-oriented (GO) electrical steel is an important soft magnetic material used as lamination core in stationary electrical machinery. The superior magnetic properties of this material, namely high magnetic induction and low core losses, mainly depend on the state of secondary recrystallization (SRX). The size, quantity and distribution of precipitates are key factors affecting SRX process and final properties of this material [1]. Despite the development of high performance GO steel has been a scientific focus for several decades, computer models able to predict size distribution and evolution of precipitates in multiple matrix phases are still missing. The lack of a comprehensive computer model mainly originates from the complex phenomena characterizing GO steel, such as partial phase transformation, high temperature deformations, recrystallization, etc. Moreover, the production of this material involves one of the most complex technologies in steel plants in terms of process conditions, control requirements, and metallurgical knowledge. Here a novel computational model able to predict kinetics of precipitates in dual phase steels is presented [2]. The model is applied to a typical industrial GO electrical steel subjected to production steps ranging from continuous casting to coiling after hot rolling. For a straightforward understanding of the proposed method, the abovementioned production steps are represented by a simplified thermo-mechanical profile. We demonstrate that our methodology represents a powerful tool for both qualitative and quantitative assessment of precipitates evolution in dual phase steels. The developed technique allows us to derive relationships between process parameters and microstructure enabling to control microstructure's evolution along the production route of GO electrical steel.

Biography

Vanessa Quaranta is a researcher and project leader at the NLMK Group that is a leading international manufacturer of high-quality steel products. She is employed at the European R&D Center of NLMK that is located in Belgium. Vanessa is a chemist by training specialized in computer simulations combined with a particularly expertise in reactivity, thermodynamics and thermo-kinetics. She gained vast experience in the application of modern tools and development of new techniques to address complex challenges in metallurgy, chemistry, and material science. Vanessa strongly believes that research collaborations between academic and industrial partners are essential for the development of new processes and new products as well as the improvement of pre-existing ones.

Breathing Atom

Navin Khaneja

System and Control Engineering, IIT Bombay, India

Here we discuss a subtle point in quantum mechanics. A nuance are atomic orbitals, correct? Is hydrogen atom true? We claim almost, but in true, the atom breathes. Electron orbital is a linear combination (superposition) of electron waves (plane waves). The waves scatter of the coulomb potential of the nucleus. Electron wave with wave-vector, has momentum and energy and group velocity. The plane wave, acquires a phase and scatters to another wave with scattering amplitude that depends on Coulomb potential. All in all, the orbital acquires a phase, the energy of the orbital. But there is a problem, the electron waves have group velocity, they are running way from each other, they won't stay together, the orbital will become bigger, the orbital will diffuse away and then come back, the atom will pulsate, it will breathe. The physics is rescued by invoking photon mediated electron coupling to vacuum.

Biography

Navin Khanega has completed his B. Tech in Electrical Engineering (EE) from IIT Kanpur in 1994 and Masters in EE and Mathematics from Washington University, St Louis in 1997. He received a Ph.D. in applied mathematics from Harvard University in 2000.

He is recipient of NSF career award, Sloan fellowship and Bessel prize of Humboldt foundation. His research is in areas of control and NMR. He is the author of 90 Journal papers.

INDEX

ADV. CHEMISTRY 2025

PEERS ALLEY MEDIA

ADV. CHEMISTRY 2025

Peers Alley Media
1126 59 Ave East, V5X 1Y9, Vancouver BC, Canada
WhatsApp No: +1 (506) 909-0537

BOOKMARK YOUR DATES

7th Edition of

ADVANCED CHEMISTRY WORLD CONGRESS

MARCH 2026 | ROME, ITALY