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2nd World Congress on Nanotechnology & 2nd Global Event on Materials Science and Engineering

LONDON, UK

NOVEMBER 06-07 2025

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Thank You All

DAY- 01

ORAL PRESENTATIONS

06-07, NOVEMBER 2025

LONDON, UK

Agne Kairyte

Vilnius Gediminas Technical University
Lithuania

Sustainable utilization of tire textile waste for the production of high-quality thermal insulation mats for building industry

Abstract:

Waste tire textile fiber is a byproduct of the processing of end-of-life tires. It is commonly disposed of through incineration or landfilling-both of which present significant environmental hazards. However, having a fibrous structure, waste tire textile can find potential applications in the production of thermal insulation materials. It has been discovered that 80% of waste tire textile fiber is utilized in the manufacturing of thermal insulation mats using non-woven technology. The remaining 20% of the raw material was strategically used for twining, stabilizing, and enhancing the mats' properties, and this portion comprised of bicomponent polyester fiber, recycled polyester fiber and hollow polyester fiber. Studies on these mats have shown that their thermal conductivity ranges from 0.0338 W/(m·K) to 0.0412 W/(m·K). The tensile strength, measured parallel to the direction of formation, varies from 5.60 kPa to 13.8 kPa, while the strength measured perpendicular to the forming direction ranges from 7.0 kPa to 23 kPa. Additionally, both the fibers and the finished product exhibit low water absorption values, which depend on the composition and range from 1.5% to 4.3%, as well as higher water contact angles.

Biography

Agne Kairyte has completed her PhD at the age of 29 years from Vilnius Gediminas Technical University in the field of Materials Engineering. She has published more than 60 papers in reputed journals and participated in international and national conferences.

Abbas Alshehabi

Bahrain Polytechnic
Kingdom of Bahrain

Magnetic behavior of honeycomb electrode structures for battery optimum performance

Abstract:

Since Li-ion batteries have been commercialized in 1991 by a Sony and Asahi Kasei team, they have found a wide range of applications in industry and everyday life. The demand on lithium is increasing. Due to limited supply, researchers are moving to battery technologies that do not require lithium (i.e., beyond lithium-ion battery technologies). Future goals for Beyond Li-ion batteries (BLIs: Na+, K+, Mg2+, Zn2+, Al3+, etc.) research have to include high-density and low cost, safety, nontoxicity, high density packing with thin films, large cycle durability with high temperature, light weight and smaller volume. In addition to their lower price, these ions have other advantages. Larger monovalent ions (Na+ and K+) require lower desolation energy than the smaller Li+ ion, thus improving the kinetics of the ion insertion process at the electrode/electrolyte interface, which is important for high power. In addition, unlike lithium, sodium does not form an alloy with aluminum. Therefore, heavy and expensive copper current collectors can be replaced with aluminum for anodes in Na-ion batteries. High energy density can be achieved by combining multivalent ions (Mg+2 and Al+3), which is effective in small device battery performance. However, beyond Li ions are either larger in size than Li, or carry a higher charge; which limits their diffusion in the crystal lattice of electrode materials. Because they operate at lower voltages than Li-ion batteries, higher capacity cathode materials are necessary to increase the energy storage of Na-ion batteries as well as Mg-ion batteries. Larger beyond Li-ions e.g., Potassium ions, shuttle back and forth through the electrolytes to the electrodes. The cathode principally restricts the energy density of potassium-ion batteries. However, magnetic field applied to the magnetically active electrodes may speed up charging and increase battery performance. In this paper; transition metals, typically Mn, Fe, Co, and/or Ni, allow for the cathodes to make use of their magnetic properties. Candidate electrode materials doped with magnetic elements are proposed and analyzed to make use of their magnetic properties.

Biography

Abbas Alshehabi has completed his PhD in Materials Science & Engineering in 2012 from Kyoto University. He worked as a research engineer for several corporations in Japan before he joined the National Institute of Technology (NIT)- Japan, and then Bahrain Polytechnic-Bahrain as an assistant professor. Worked on grazing X-ray analysis, including total reflection X-ray spectroscopy (TRXPS) which, for the first time, investigated chemical properties of hard disk top layer fluorocarbon by TRXPS. Conducted XPS plasmon intrinsic and extrinsic analysis beside angle resolved XPS. Worked on SEM-EDX and XRR (X-ray reflectivity) and Energy materials where he published research in Q1 journals.

Jakub Tomasz
Poznan University of Technology, Poland

The Application of Choline Salts Based Electrolytes in Electrochemical Capacitors

Abstract:

Choline salts, most commonly occurring as choline chloride, have recently attracted considerable scientific interest due to their unique structural and electrochemical features. Their high ionic conductivity and ability to decrease the crystallization temperature of electrolyte systems make them highly promising candidates for use in advanced energy storage devices. Furthermore, their low toxicity and biodegradability allow them to be classified as environmentally friendly materials, which is an additional advantage in the search for sustainable electrolyte solutions. In this study, a series of novel salts containing choline cation combined with various carboxylic anions, including tartaric, maleic, citric, and others, were synthesized. Their physicochemical properties were systematically examined, with a particular focus on solubility in selected organic solvents such as acetone, ethanol, dimethyl sulfoxide, ethylene glycol and isopropanol. The resulting solutions, with solvents capable to dissolve selected salts, were further subjected to preliminary electrochemical characterization, among others temperature-dependent ionic conductivity measurements. Based on these results, electrolytes displaying the most favourable conductivity were identified and subsequently applied in the assembly of electrochemical capacitors. The obtained results of electrochemical investigation highlight the significant potential of application of choline-based electrolytes in supercapacitors, demonstrating their capability for further optimization and possible application in next-generation electrochemical energy storage systems. The study has been financed by the Minister of Science and Higher Education, Republic of Poland, under the Programme "Studenckie koła naukowe tworzą innowacje"

Biography

Jakub Tomasz is a master's student in chemical technology at Poznań University of Technology, specialising in applied electrochemistry. He is an active member of the "Poli-MERitum" student's scientific grup, focusing on polymer materials, their synthesis, applications, and advanced characterisation. As one of the project leaders, he contributes to the research initiative "Studenckie koła naukowe tworzą innowacje," funded by the Polish Ministry of Science and Higher Education. His engineering thesis concerns the synthesis of electrode materials based on metal sulphides and their application in sodium-ion cells. As a young researcher, he has had the opportunity to present the findings of his work at scientific conferences.

Humaira Khan

University of Campania,
Italy

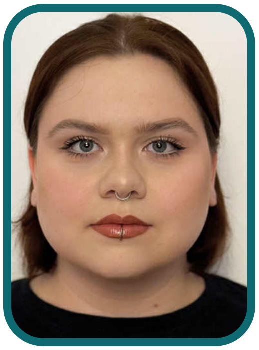
Camellia Japonica flower mediated green synthesis of silver nanoparticles and its combination therapy with antimicrobial polymer against multi-drug-resistant bacteria

Abstract:

Multidrug-resistant (MDR) bacteria are a growing global threat, diminishing the efficacy of conventional antibiotics. This study presents a novel combination therapy involving green-synthesized silver nanoparticles (AgNPs), mediated by Camellia japonica flower extract, and the cationic polymer PONI-C11-TMA. Camellia genus, belonging to the Theaceae family, exhibits significant potential as biogenic reducing and stabilizing agents for synthesis of metallic nanoparticle. AgNPs, renowned for their broad-spectrum antimicrobial activity, were characterized by UV–Vis spectroscopy (single peak at 400 nm), dynamic light scattering (DLS), and transmission electron microscopy (TEM), confirming a uniform spherical morphology (20–30 nm). The molecular weight of polymer with poly(oxanoborneneimide) (PONI) backbone with a C11 alkyl chain and trimethylamine-TMA functional group, was determined via gel permeation chromatography (GPC). Minimum inhibitory concentrations (MICs) were tested against two gram-negative strains: Acinetobacter baumannii (CD-575) and Escherichia coli (CD-2), with MICs of 10 µg/mL for AgNPs and 2.5 µg/mL for the polymer. Cytotoxicity assessment using Alamar Blue on NIH 3T3 fibroblasts showed >90% cell viability at antimicrobial-effective doses, indicating strong biocompatibility. Synergistic potential was evaluated through checkerboard assays, revealing increased MICs under combination treatment, 2–4 fold for A. baumannii and 4–8 fold for E. coli. The calculated fractional inhibitory concentration (FIC) index of 0.75 indicated an additive interaction. Overall, this phytochemically capped nanoplatform combined with cationic polymer assemblies demonstrates enhanced antimicrobial activity, and additive therapeutic effect, suggesting a promising approach to combat MDR infections while minimizing resistance development.

Biography

Humaira Khan is currently pursuing her PhD in Technologies for Resilient Living Environments at the University of Campania, Italy, with a research focus on plant-extract-functionalized nanomaterials. She recently completed a visiting research fellowship at the University of Massachusetts, USA, where she explored polymeric nanomaterials for antimicrobial applications. Her interdisciplinary background in chemistry and nanotechnology spans Pakistan, Turkey, Italy, and the United States, and she has received multiple government-funded scholarships and awards for academic excellence and international research collaboration.



Xymena Gross

Poznan University of Technology
Poland

Natural materials to electrochemistry: functional carbon materials for sustainable supercapacitor applications

Abstract:

The development of sustainable energy storage technologies requires the integration of environmentally benign and renewable materials into high-performance electrochemical devices. Among the available options, electrochemical double-layer capacitors (EDLCs), commonly referred to as supercapacitors, have attracted considerable attention due to their high-power density, rapid charge-discharge capability, and long cycle life. However, the performance of EDLCs is critically dependent on the physicochemical properties of the carbon-based electrode materials, including their surface area, pore size distribution, conductivity, and surface functionalities. Lignin, as the second most abundant natural polymer and a by-product of the pulp and paper industry, provides a renewable and underutilized carbon source. Through controlled carbonization and activation processes, lignin can be converted into porous carbon frameworks with tunable textural and chemical properties suitable for electrochemical applications. The presence of heteroatoms in the lignin backbone further enables the introduction of surface functionalities, which may enhance charge storage mechanisms beyond pure double-layer capacitance by contributing pseudocapacitive effects. In this work, lignin-derived carbons were synthesized and evaluated as electrode materials for supercapacitors. Electrochemical testing demonstrated specific capacitances on the order of ~70 F/g in aqueous electrolytes, and high cyclic stability. These findings highlight the potential of lignin-based carbons not only as cost-effective and environmentally friendly materials.MDR infections while minimizing resistance development.

Biography

Xymena Gross is a master's student in Chemical Technology at the Poznań University of Technology. She specialises in applied electrochemistry. She works in an interdisciplinary manner, combining chemistry, green chemistry and energetics science. As a young scientist, she stands out from her peers by regularly publishing her results in scientific journals and presenting them at international conferences.

Yinbo Gan

Zhejiang University
China

Bioderived green carbon quantum dots boost plant growth and photosynthesis in Maize

Abstract:

The process of photosynthesis accounts for 90 % of the dry matter produced in crops. To improve photosynthesis, it is more sustainable to employ ecologically safe nanomaterials in order to reduce the risks associated with using metallic or inorganic nanoparticles in plants. This work demonstrates a sustainable method of employing green synthesized fluorescent nitrogen-functionalized carbon quantum dots (NCQDs) produced from a bioderived carbon precursor (whole-grain wheat flour) using a unique two-step green synthesis approach. The organic NCQDs application to maize seedlings significantly improved photosynthetic efficiency and upregulated genes (ZmPEPC, ZmRUB, ZmPPDK, ZmNADP-ME, ZmNADP-MDH and ZmCA) involved in CO2 fixation and carbon assimilation, which greatly increased maize biomass and carbohydrate synthesis. Interestingly, application of NCQDs improved chlorophyll, root-shoot fresh weights, dry masses, and plant height in both hydroponics and seed priming. The UV – vis spectrum of NCQD exhibited excitation dependent emission and strongest emission observed in the range of blue light (445 nm) at the excitation between 360 – 390 nm. After receiving NCQD treatment, the amount of total soluble carbohydrates was 32.8 % greater than in the control group due to increased photosynthetic efficiency, stomatal conductance, electron transport rate (ETR), effective quantum yield of PSII (ΦPSII) and CO2 fixation. The ETR, maximum quantum efficiency (Fv/Fm), maximum fluorescence (Fm), ΦPSII, chlorophyl a (Ca), chlorophyl b (Cb) and carotenoid (Cx+c) contents were also higher in NCQD treated plants exposed to UV (A, B and C) as compared to the control group. However, UV light harvesting ability was greater under UV-A and UV-B exposure as compared to UV-C owing to the harvesting ability of NCQD falls under UV-A and UV-B wavelength ranges. The MTT assay demonstrated that the NCQD cytotoxicity towards HeLa cells was also negligible. This novel study proved that bioderived non-toxic fluorescent NCQDs, by supplementing light harvesting capacity of chlorophyll (in vivo), enhanced the efficiency of the photosystem, improved the electron transport chain, upregulated the expression of genes related to CO2 fixation and carbon assimilation, and improved the machinery responsible for photosynthesis in maize.

Biography

Yinbo Gan has completed his PhD at the age of 30 years from Groningen University and postdoctoral studies from National University of Singapore, Lancaster University and University of York, Department of Biology. He is the director of Plant Molecular Biology Lab from College of Agriculture and biotechnology, Zhejiang University. He has published more than 100 papers in reputed journals and has been serving as an editorial board member for four SCI journals.

DAY- 01

KEYNOTE PRESENTATIONS

06-07, NOVEMBER 2025

LONDON, UK

Pedro Fonte

University of Algarve
Portugal

Multifunctional Nanomaterials at the Interface of Cancer Diagnosis and Therapy

Abstract:

Nanomaterials are reshaping the landscape of cancer diagnosis and therapy by enabling early detection, targeted delivery, and enhanced therapeutic efficacy. This presentation showcases two complementary nanomaterial-based platforms designed to advance cancer theranostics. The first system involves a novel hydrogel composed of carboxymethyl cellulose (CMC) incorporated with nanographene oxide (nGO) for bioimaging-assisted cervical cancer diagnostics. Leveraging the distinctive optical and electrical properties of nGO, this hybrid hydrogel exhibits superior bioimaging performance, allowing early-stage detection of malignant cells. The CMC/nGO hydrogels display outstanding antioxidant activity (~90%) and excellent biocompatibility (>90%), underscoring their potential as multifunctional biomaterials for combined diagnostic and therapeutic applications. The second approach focuses on a targeted drug delivery system using camptothecin (CPT)-loaded mesoporous silica nanoparticles (MSNs) functionalized with CpG oligodeoxynucleotides (CpG ODN) for skin cancer treatment. The chitosan-coated MSNs achieve high drug encapsulation efficiency (≈95%) and targeted release, while the CpG ODN component stimulates antitumor immune responses. In vitro and in vivo results demonstrate enhanced cytotoxicity toward cancer cells and significant tumor regression. Collectively, these findings illustrate how nanomaterial-driven platforms can integrate bioimaging, immunomodulation, and controlled drug delivery into a single therapeutic strategy, paving the way for the next generation of precision cancer therapies.

Biography

Pedro Fonte is an Assistant Professor at the Faculty of Sciences and Technology, University of Algarve, and a researcher at CCMAR and iBB–Institute for Bioengineering and Biosciences, University of Lisbon. His research focuses on the design of nanocarriers for targeted and controlled drug delivery, overcoming biological barriers to enhance therapeutic precision. He has led multiple funded research projects and authored over 60 peer-reviewed papers, book chapters, and an edited volume. Recognized among Stanford University's Top 2% Scientists, he has received numerous international distinctions.

Muhammad Omar Shaikh

Tunghai University
Taiwan

Multiplexed Nanocomposite Immunosensor for Point-of-Care Cancer Diagnostics

Abstract:

Early detection and monitoring of cancer remain a major global health challenge, as existing point-of-care (POC) diagnostic tools often suffer from qualitative outputs, high false-positive rates, and limited multiplexing capabilities, restricting their clinical utility. To address these limitations, we present a multiplexed electrochemical immunosensor engineered for the simultaneous detection of clinically relevant cancer biomarkers in complex biological fluids. The platform leverages a novel multifunctional 3D nanocomposite coating, composed of a porous bovine serum albumin (BSA) matrix integrated with highly conductive carbon nanotubes (CNTs). This nanostructured interface enables oriented antibody immobilization, suppresses nonspecific adsorption, facilitates unhindered analyte diffusion, and enhances electron transfer, thereby achieving high sensitivity and specificity in complex sample environments. As a demonstrator for clinical translation, the immunosensor was validated for bladder cancer biomarkers—APO-A1, VEGF, and IL-8—showing broad dynamic ranges (0.1–1000 ng/mL) and ultralow limits of detection (22–44 pg/mL). The sensor exhibited excellent reproducibility (n = 5, RSD = 2.2%), robust antifouling properties against common urinary interferents, and remarkable stability after one month of storage in serum and urine. Implemented on a low-cost, disposable screen-printed platform, this approach enables rapid, non-invasive biomarker profiling directly at the POC. These findings highlight the transformative potential of multiplexed nanocomposite immunosensors for cancer diagnostics, offering a viable alternative to invasive procedures and paving the way toward accessible, sensitive, and specific early-stage cancer detection at the point of care.

Biography

Muhammad Omar Motamid Shaikh is Associate Professor of Sustainability Science and Management at Tunghai University, Taiwan, and Director of the Advanced NanoTech Laboratory (ANT Lab). He holds an MEng in Materials Science and Engineering from Imperial College London and a PhD in Mechatronic Science and Engineering from Southern Taiwan University of Science and Technology. His interdisciplinary research integrates nanotechnology, electrochemistry, flexible electronics, and AIoT, with a focus on developing high-performance functional nanomaterials for applications in medical diagnostics, sustainable energy, and carbon-neutral technologies. He previously served as Chief Technology Officer at BiTAPE Logistics, a university spin-off that pioneered smart printed tape technology for real-time supply chain visibility and AI-enhanced logistics services.

Assunta Borzacchiello

National Research Council of Italy
Italy

Polysaccharide-Based Biomaterials: From molecular design to therapeutic translation

Abstract:

Polysaccharides represent one of nature's most versatile classes of biopolymers, combining structural complexity, biofunctionality, and chemical tunability. Their intrinsic biocompatibility, hydration capacity, and receptor-mediated bioactivity make them ideal candidates for the design of advanced biomaterials and targeted delivery systems. This lecture will explore the path "from molecular design to therapeutic translation," focusing on natural polysaccharides such as hyaluronan, chitosan, and alginate as functional building blocks for biomedical technologies. Through chemical modification and physical structuring—ranging from hydrogels to nanoparticles—these polymers can be engineered to achieve precise control over viscoelasticity, degradation, and bio-interactivity. Integrating rheological and microfluidic analyses, our research elucidates how polysaccharide organization governs cell–matrix crosstalk and drug transport within complex biological environments. By exploiting receptor-specific interactions (e.g., CD44 for HA-based systems) and multiscale material design, we aim to bridge the gap between fundamental polymer science and precision therapeutics. This keynote highlights recent advances in the development of polysaccharide-based platforms for regenerative medicine and nanomedicine, emphasizing how molecular insights and materials engineering converge to enable the next generation of bioinspired therapeutic systems.

Biography

Assunta Borzacchiello earned her M.S. degree in Chemical Engineering cum laude and the PhD degree in Material Technologies (1998) at University of Naples "Federico II." She was a Research Scientist at QMWC University of London (1996) and at University of Connecticut, USA (1997). She was Professor of Biomaterials at the University of Naples "Federico II" from 2002 to 2011. She was a visiting professor at McGill University, Canada (2018-2019). She is currently the Research Director at IPCB-National Research Council of Italy. She is the author of about 120 peer-reviewed papers (H-index 40). The Borzacchiello research activities focus on Biomimetic materials and natural polymers for biomedical applications and nanomedicine, microfluidic techniques, rheology and microrheology of complex fluids.

Nesrin Hasirci

Middle East Technical University, Turkey

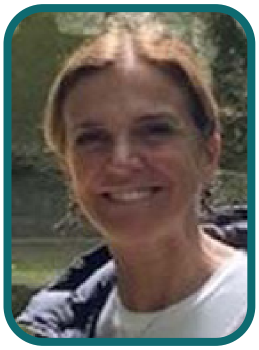
Medical Devices Having Nano System

Abstract:

There are various materials used for the treatment of the damaged or malfunctioning tissues and organs. Generally, these materials are manufactured in macro size. On the other hand, in many cases, there is a need for micro or nano modifications for these medical devices. The most important application is related to the surface since the surface of an implant is the first part come in contact with tissue. Surface should have high biocompatibility and/or bioactivity. A nano level coating of a vascular graph with an antithrombogenic material prevent blood coagulation; or adding nano size hydroxyapatite crystals in a bone filler enhance its bioactivity and attachment of bone cells on the implant leading fast formation of natural bone. Meantime, there are nano particles, capsules or spheres used for targeting drugs to the desired area (mostly to the cancer tumor tissue) and release the active agent over there at effective dose in a sustained way. In tissue engineering applications, generally polymeric materials are used for the preparation of scaffolds. In general, these scaffolds have micron size pores and nano size fibers or membranes. One important point is the adhesion of cells on the scaffold, and then migrate and proliferate to form a new tissue over there. Nano designs on the implant surfaces can also maintain proliferation of cells in a certain direction.

Biography

Nesrin Hasirci is a member of Middle East Technical University BIOMATEN-Center of Excellence in Biomaterials and Tissue Engineering (Turkiye), and Near East University (TRNC). Her research covers: micro and nano modifications of polymers and composites used in medicine. She has more than 250 scientific publications, 7 patents (4 pending), 21 chapters, 2 books (as one of the two authors of the 'Fundamentals of Biomaterials' and one Turkish lecture book). She received 'Science Award' given by M.Parlar Foundation and 'Technology Award' given by Elginkan Foundation. Her h-index is 53 (Google Scholar). She is Honorary Member of 'European Society of Biomaterials'; and Fellow of the Science Academy' (Turkiye).



Gabriella Fiorentino

University of Naples Federico II
Italy

Microbial synthesis of silver nanoparticles: Characterization and applications in environmental science

Abstract:

Silver nanoparticles (AgNPs) are widely recognized for their unique physical and chemical properties, making them valuable in various fields, including antimicrobial coatings for medical devices, water purification technologies, and biosensors for electronics and bioimaging. However, traditional physical and chemical synthesis methods are often environmentally harmful, generating substantial side products. This has led to increasing interest in eco-friendly alternatives, particularly those leveraging microorganisms. Among these, bacteria isolated from extreme environments are particularly promising, as their resilience to harsh conditions enables the synthesis of nanoparticles under a broad range of parameters often inaccessible with conventional techniques. In this study, AgNPs were biosynthesized using the cell-free secretomes of different thermophilic microorganisms belonging to our collection. The synthesis process was monitored using UV-Vis spectrophotometry and the resulting nanoparticles characterised through transmission electron microscopy, Fourier transform infrared spectroscopy, and dynamic light scattering with zeta potential analysis. Their catalytic potential was also assessed by evaluating their ability to degrade dyes, highlighting their potential for environmental applications. These findings position extremophilic microorganisms as biological sources for the sustainable production of nanomaterials, further emphasizing their role in developing eco-friendly biotechnological processes.

Biography

Gabriella Fiorentino is an Associate Professor of Biochemistry at the University of Naples Federico II. She has published about 60 papers in reputed journals and has been serving as an editorial board member of repute. Over the years, research activities have fostered international collaborations, contributing to the leadership and participation in funded projects. Additionally, they have enabled the organization and participation of national and international scientific workshops and conferences. Currently, her major research focuses on the identification and characterization of novel microorganisms from extreme environments and their ability to produce metal nanoparticles as a cost-effective and environmentally sustainable process for biotechnological applications in various fields.

Thomas J. Webster
Brown University
USA

30,000 Nano Implants in Human with No Failures...And Still Counting

Abstract:

Nanomedicine is the use of nanomaterials to improve disease prevention, detection, and treatment which has resulted in hundreds of FDA approved medical products. While nanomedicine has been around for several decades, new technological advances are pushing its boundaries. For example, this presentation will present an over 25year journey of commercializing nano orthopedic implants now in over 30,000 patients to date showing no signs of failure. Current orthopedic implants face a failure rate of 5 – 10% and sometimes as high as 60% for bone cancer patients. Further, Artificial Intelligence (AI) has revolutionized numerous industries to date. However, its use in nanomedicine has remained few and far between. One area that AI has significantly improved nanomedicine is through implantable sensors and neurological applications. This talk will present research in which implantable sensors, using AI, can learn from patient's response to implants and predict future outcomes. Such implantable sensors not only incorporate AI, but also communicate to a handheld device, and can reverse AI predicted adverse events. Examples will be given in which AI implantable sensors have been used in neurology to inhibit implant infection and promote prolonged neural function. Moreover, in vitro and in vivo experiments will be provided that demonstrate how nanotechnology can be incorporated into neurology to help human health.

Biography

Thomas J. Webster's (H index: 130) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has formed over a dozen companies who have numerous FDA approved medical products currently improving human health in over 30,000 patients. His technology is also being used in commercial products to improve sustainability and renewable energy. He is currently helping those companies and serves as a professor at Brown University, Saveetha University, Hebei University of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies. Prof. Webster is a former President of the U.S. Society for Biomaterials and has over 1,350 publications to his credit with over 55,000 citations. He was recently nominated for the Nobel Prize in Chemistry. Prof. Webster also recently formed a fund to support Nigerian student research opportunities in the U.S.

DAY- 02

KEYNOTE

PRESENTATIONS

06-07,
NOVEMBER
2025

LONDON, UK

Mehmet Odabasi

Aksaray University
Turkey

New Preparation Method for Biopolymer-Based Nanomaterials: Preparation, Characterization and Applications

Abstract:

Dipeptide- and protein-based nanomaterials (NMs) have emerged as promising platforms in nanomedicine due to their biocompatibility, biodegradability, and functional versatility. These biomolecule-derived nanostructures enable precise drug delivery, molecular imaging, and targeted therapy, particularly in cancer and neurodegenerative diseases. Dipeptide-based nanoparticles offer structural simplicity and tunable self-assembly properties while protein-based NMs, especially derived from natural sources cost-effective proteins like albumin and lysozyme, offer defined architectures and intrinsic biological functions that enhance cellular uptake and therapeutic efficacy. Despite significant progress, challenges remain in large-scale production, stability, and immune responses. Denatured protein-based NMs, recently developed by our group, stand out as an important development in the field of therapy, especially since they enable more effective encapsulation and longer release of hydrophilic and hydrophobic drugs. Future developments will likely focus on rational design using computational modeling, functional hybrid materials, and stimulus-responsive systems to enhance selectivity, safety, and clinical translation. The integration of these biopolymer-based NMs with personalized medicine promises to revolutionize therapeutic strategies and diagnostics in the near future.

Biography

Mehmet Odabasi (PhD) is Professor of Biochemistry at the Department of Chemistry, Aksaray University, Aksaray, Turkey. He is the author of more than 80 articles in peer-review journals with a h-index of 29. He has authored chapters in 7 books, 5 of which are international. Dr. Odabasi has completed many national and international high-grant projects. His research interests are preparation and surface modification of bio- and synthetic polymeric micro and nanomaterials, and their applications in biomedicine, affinity chromatography, biosensors regarding molecular imprinting, food safety, and the environmental sciences.

Abrukov Victor

Chuvash State University
Russia

Data Science for Solving Inverse Problems: The Materials Genome and Beyond

Abstract:

The intensive development of Data Science and artificial intelligence methods opens up new possibilities for fundamental and applied research in the field of high-energy materials. The accumulated significant volume of experimental data on the combustion characteristics of such materials, particularly solid rocket propellants (SRPs) with nano additives, creates the prerequisites for building intelligent predictive models in the framework of world famous "Materials Genome Initiative" (USA). Traditionally, experimental research and modeling are aimed at solving the direct problem: determining the burning rate for a given material composition and conditions (e.g., pressure). However, for the efficient development of new compositions with required properties and the optimization of existing ones, solving inverse problems is critically important. In this work, the authors present an approach based on the application of Data Science methods, particularly neural networks, for solving key inverse problems in the field of SRP combustion. Based on extensive experimental data, including results on the burning rate of various SRP compositions with micro- and nano-sized additives (metals, metal oxides, composite catalysts, thermites, organic metal salts, carbon nanomaterials), multifactor computational models based on neural networks were built.

These models are capable of identifying complex, nonlinear dependencies between the component composition, combustion conditions, and the achievable burning rate. The developed models allow solving inverse problems, such as:

- Determining the optimal component composition of SRP ensuring a specified burning rate under specific conditions.
- Predicting the conditions (e.g., pressure) necessary to achieve a desired burning rate for a given composition.
- Conducting "virtual experiments"-predicting the burning characteristics for compositions and additive combinations that have not been directly studied experimentally.

The developed models demonstrate the potential for creating a digital platform, which can be considered a basis for forming a "Genome of High-Energy Materials". Such a platform will accelerate the material development cycle through rational design and a reduction in the number of expensive physical experiments.

A key direction for further development of this approach is enriching the predictive models with fundamental data about component properties (metadata), including quantum, physicochemical, and thermodynamic characteristics, which will increase prediction accuracy and expand the applicability of the models beyond the training sample. The presented approach is of significant importance for the development of technologies for designing and additive manufacturing of modern energetic materials.

Biography

Victor Sergeyevich Abrukov is a Russian physicist and Head of the Department of Applied Physics and Nanotechnology at Chuvash State University. He is known for his work in combustion science, nanotechnology, and the use of AI in material research. His research focuses on computational models of high-energy materials, with numerous international collaborations and publications in interdisciplinary fields.

Bernd Blobel

University of Regensburg
Germany

Managing healthcare transformation towards 5P medicine supported by technologies

Abstract:

Healthcare systems around the world are undergoing an organizational, methodological and technological transformation towards personalized, preventive, predictive, participative precision (5P) medicine ecosystems. These ecosystems consider individual health status, conditions, genetic and genomic dispositions in personal social, occupational, environmental, and behavioral contexts. For designing and managing the resulting highly interdisciplinary, complex, distributed and dynamic ecosystem, we must formally and consistently represent the system and its components at necessary granularity levels from the perspective of all actors including the subject of care. As those actors from different domains have different education, skills, and experiences, using different methodologies, languages and terminologies, communication and cooperation, i.e. interoperability, must advance from the data level (data sharing) to the knowledge level (knowledge sharing). To understand the business system, it must formally represent each considered use case structurally and functionally. Therefore, the design, implementation and management of intelligent and ethical transformed ecosystems must be realized, using a system-theoretical, architecture-centered, ontology-based and policy-driven approach, developed by the author over the last 30 years. The related model and framework have been meanwhile standardized as the ISO 23903 Interoperability and Integration Reference Architecture, defined as mandatory for any specification or project at ISO, CEN, IEEE, OMG, etc., addressing more than one domain. Thereby, it manages also security, privacy and trust in detail. The Keynote introduces necessary standards and methodologies for designing and managing 5P medicine ecosystems as well as practical examples.

Biography

Bernd Blobel studied Mathematics, Technical Cybernetics and Electronics, Bio-Cybernetics, Physics, Medicine and Informatics at the University of Magdeburg and other universities in the former GDR. He received his PhD in Physics with a neurophysiological study. Furthermore, he performed the Habilitation (qualification as university professor) in Medicine and Informatics. He was Head of the Institute for Biometrics and Medical Informatics at the University of Magdeburg, and thereafter Head of the Health Telematics Project Group at the Fraunhofer IIS in Erlangen. Thereafter, he acted until his retirement as Head of the German National eHealth Competence Centre at the University of Regensburg, as well as Head of the globally unique International Interdisciplinary PhD and PostDoc College. He was and is still leadingly involved in many countries' health digitalisation as well as electronic health record strategy. He published more than 600 papers, published/edited many books and supervised a large number of PhD students from all around the world. He was a German Representative to many SDOs, such as HL7, ISO, CEN, OMG, IEEE, ASTM, SNOMED, etc., also chairing the national mirror groups. Furthermore, he is still engaged in international higher education. He is a Fellow of several international academies.

Osman Adiguzel

Firat University
Turkey

Memory Characteristics and Crystallographic Transformations governing reversibility in shape memory alloys

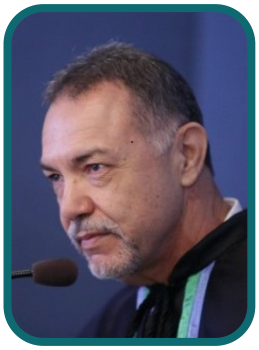
Abstract:

Shape memory alloys take place in a class of advanced smart materials by exhibiting dual memory characteristics, shape memory effect and superelasticity, with the recoverability of two shapes at different conditions. Shape Memory Effect is initiated with thermomechanical treatments on cooling and deformation and performed thermally on heating and cooling, with which shape of the material cycles between original and deformed shapes in reversible way. Therefore, this behavior can be called thermal memory or thermoelasticity. This phenomenon is governed by the crystallographic transformations, thermal and stress induced martensitic transformations. Thermal induced martensitic transformations occur on cooling with cooperative movement of atoms in <110 > -type directions on {110} – type close packed planes of austenite matrix, along with lattice twinning and ordered parent phase structures turn into the twinned martensite structures. The twinned structures turn into detwinned martensite structures by means of stress induced martensitic transformations with deformation in the low temperature condition. Superelasticity is performed by mechanically stressing and releasing in elasticity limit at a constant temperature in the parent phase region, and material recovers the original shape upon releasing, by exhibiting elastic material behavior. Superelasticity is also result of stress induced martensitic transformation, and the ordered parent phase structures turn into the detwinned martensite structures with stressing. However, lattice twinning and detwinning reactions play important role in martensitic transformations, and they are driven by internal and external forces by means of inhomogeneous lattice invariant shears. These alloys are functional materials with these properties and used in many fields from biomedical application to the building industry.Copper based alloys exhibit this property in metastable β-phase region. Lattice twinning and lattice invariant shear are not uniform in these alloys and cause the formation of complex layered structures. These structures can be described by different unit cells as 3R, 9R or 18R depending on the stacking sequences on the close-packed planes of the ordered lattice. In the present contribution, x-ray and elec-

tron diffraction studies were carried out on copper based CuAlMn and CuZnAl alloys. X-ray diffraction profiles and electron diffraction patterns exhibit super lattice reflections. Critical transformation temperatures of these alloys are over room temperature. The specimens were aged at room temperature and taken a series of x-ray diagram during aging. X-ray diffractograms taken in a long-time interval show that diffraction angles and intensities of diffraction peaks change with the aging duration at room temperature. This result refers to the rearrangement of atoms in diffusive manner.

Biography

Adiguzel graduated from Department of Physics, Ankara University, Turkey in 1974 and received PhD- degree from Dicle University, Diyarbakir-Turkey. He studied at Surrey University, Guildford, UK, as a post-doctoral research scientist in 1986-1987, and studied on shape memory alloys. He worked as research assistant, 1975-80, at Dicle University and shifted to Firat University, Elazig, Turkey in 1980. He became professor in 1996, and he has been retired on November 28, 2019, due to the age limit of 67, following academic life of 45 years. He published over 80 papers in international and national journals; He joined over 120 conferences and symposia in international and national level as participant, invited speaker or keynote speaker with contributions of oral or poster. He served the program chair or conference chair/co-chair in some of these activities. In particular, he joined in last six years (2014 - 2019) over 60 conferences as Keynote Speaker and Conference Co-Chair organized by different companies. Also, he joined over 230 online conferences in the same way in pandemic period of 2020-2024. He supervised 5 PhD- theses and 3 M. Sc- theses. Dr. Adiguzel served his directorate of Graduate School of Natural and Applied Sciences, Firat University, in 1999-2004. He received a certificate awarded to him and his experimental group in recognition of significant contribution of 2 patterns to the Powder Diffraction File – Release 2000. The ICDD (International Centre for Diffraction Data) also appreciates cooperation of his group and interest in Powder Diffraction File.



Paulo Cesar De Morais

Catholic University of Brasilia
Brazil

Using nanocomposites for radiofrequency modulation in cancer therapy

Abstract:

In this keynote talk, it will be explored the use of the Hill model to assess the Benchmark dose (BMD), the lethal dose 50 (LD50), the cooperativity (E) and the dissociation constant (K) while analyzing cell viability data using nanomaterials. The presentation is addressed to discuss the antitumor potential while combining radiofrequency (RF) therapy in and selected nanomaterials. In particular, it will be discussed the use of nanocomposites, for instance comprising graphene oxide (GO) surface functionalized with polyethyleneimine (PEI) and decorated with gold nanoparticles (GO-PEI-Au). Data collected from the cell viability assays using different tumor cell lines (e.g. LLC-WRC-256 and B16-F10) will be presented and discussed. The findings will demonstrate that while the tested nanocomposite (e.g. GO-PEI-Au) may be biocompatible against different cancer cell lines in the absence of radiofrequency (nRF), the application of radiofrequency (RF) enhances the cell toxicity by orders of magnitude, pointing to prospective studies with the tested cell lines using tumor animal models.

Biography

Paulo Cesar De Morais (H60), PhD, was full Professor of Physics at the University of Brasilia (UnB) – Brazil up to 2013. Appointed as UnB's (Brazil) Emeritus Professor (2014); Visiting Professor at HUST – China (2012-2015); Distinguished Professor at AHU – China (2016-2019); Full Professor at the Catholic University of Brasília (UCB) – Brazil (2018); CNPq-1A Research Fellow since 2010; 2007 Master Research Prize from UnB. He held two-years (1987-1988) post-doc position with Bell Communications Research, New Jersey – USA and received his Doctoral degree in Solid State Physics (1986) from the Federal University of Minas Gerais (UFMG) – Brazil. With more than 13,500 citations, He has published over 500 papers, presented more than 200 international invited talks (35 countries), and filled 16 patents.Powder Diffraction File – Release 2000. The ICDD (International Centre for Diffraction Data) also appreciates cooperation of his group and interest in Powder Diffraction File.

Rakesh M. Patel

Gujarat Arts & Science College
India

Comparative analysis of Kozeny Carmon based grounded short bearing with the inclusion of viscosity variation and deformable roughness

Abstract:

The study investigates the effects of elastic deformation in a porous, rough, short bearing lubricated by a ferrofluid, incorporating viscosity variation. It employs Rosensweig's viscosity expression to evaluate how changes in viscosity impact the system and uses the Neuringer-Rosensweig model (NRM) to describe magnetic fluid flow. An averaged stochastic modified Reynolds equation has been developed to determine pressure distribution based on parameters such as elastic deformation, viscosity variation, porosity, and aspect ratio, followed by load calculation. The analysis of Load Carrying Capacity (LCC) is presented graphically, considering different bearing parameters. The findings suggest that increasing magnetization and viscosity variation can enhance the LCC if the aspect ratio is appropriately selected. Conversely, LCC decreases with higher elastic deformation, roughness, and porosity. The combined effects of porosity, transverse roughness, and deformation further reduce load-bearing capacity. However, viscosity variation can partially mitigate these reductions, especially when deformation is minimal.

Biography

Rakesh Manilal Patel is a distinguished academician and researcher in the field of Mathematics, currently serving in the Department of Mathematics, Gujarat Arts & Science College, Ellis Bridge, Ahmedabad, Gujarat, India. With a strong commitment to teaching, research, and scholarly excellence, Dr. Patel has contributed significantly to mathematical sciences through his academic work, publications, and mentorship of students. His areas of interest encompass various branches of pure and applied mathematics, and he actively engages in promoting mathematical education and innovation at both undergraduate and postgraduate levels.

DAY- 02

ORAL PRESENTATIONS

06-07, NOVEMBER 2025

LONDON, UK

Rodrigo Ce

Centro Universitario Avantis
Brazil

Advances in Lipid-Core Nanocapsules: From antimicrobial and antifungal applications to cancer therapy

Abstract:

Nanotechnology has revolutionized drug delivery systems, with lipid-core nanocapsules (LNCs) emerging as a promising platform for encapsulating hydrophobic and hydrophilic drugs, enhancing bioavailability, and enabling targeted therapy. This work reviews recent advances in LNCs, highlighting their applications in antimicrobial, antifungal, and anticancer therapies. Methodologies included the preparation of LNCs using lecithin, polysorbate 80, and chitosan, with active agents such as dapsone, fusidic acid, and doxorubicin. Characterization techniques like laser diffraction, dynamic light scattering, and transmission electron microscopy (TEM) were employed, alongside biological assays to evaluate efficacy. Key findings include the significant antimicrobial and antifungal activity of dapsone-loaded LNCs against multidrug-resistant Staphylococcus aureus and filamentous fungi, as well as the enhanced antibacterial performance of fusidic acid-loaded LNCs against Gram-positive bacteria. In cancer therapy, doxorubicin-folic acid-conjugated LNCs demonstrated improved cytotoxicity, apoptosis induction, and inhibition of cancer cell migration in triple-negative breast cancer. Double-functionalized LNCs also showed superior efficacy in ovarian and bladder cancer models, with improved cellular uptake and stability. Lipid-core nanocapsules (LNCs) represent a transformative advancement in drug delivery, demonstrating remarkable efficacy in antimicrobial, antifungal, and anticancer therapies. By enhancing drug bioavailability, targeting specific tissues, and overcoming resistance, LNCs hold significant promise for clinical translation and future applications in nanomedicine. Further optimization and research are essential to unlock their full therapeutic potential.

Biography

Rodrigo Ce is a researcher and educator with a degree in Biomedicine, as well as a Masters and Ph.D. in Pharmaceutical Sciences from the Federal University of Rio Grande do Sul (UFRGS), where he received a Vote of Praise for his doctoral accomplishments. Specializing in nanostructured systems, particularly lipid-core nanocapsules, he currently serves as the Teaching Manager and Professor of the Biomedicine program at Centro Universitario Avantis Uniavan, and as Coordinator of the Postgraduate Program in Clinical Analysis and Laboratory Diagnostics. Dr. Ce is also a member of the editorial board for several scientific journals.

Sachin Sharma Ashok Kumar

Taylors University
Malaysia

A study on the corrosive performance of acrylic-epoxy based coatings: The significance of its electrochemical impedance evaluations

Abstract:

Since few decades, researchers have continuously devoted significant efforts to develop coatings as an alternative approach to protect corrosion. Herein, a series of coatings containing various ratios of acrylic and epoxy resins were developed to investigate the corrosion protection on mild steel substrates. In addition, 1 wt.% polydimethylsiloxane (PDMS) solution was incorporated as a modifier to enhance the corrosion protection performance and the hydrophobicity of the coatings. The chemical structures, degree of transparency and surface wettability of the fabricated coatings were evaluated by the Fourier-Transform Infrared Spectroscopy (FTIR), ultraviolet-visible (UV-Vis) spectroscopy and water contact angle (WCA) instrument respectively. In addition, Cross hatch test (CHT) method was employed to analyze the coating surface adhesion in accordance with the ASTM D3359 B standard. Furthermore, the electrochemical impedance spectroscopy (EIS) was employed to evaluate the corrosion protection performance of the coatings. Among all the coating samples, the EIS results revealed that the T1, T5, and T7 coating samples containing higher ratios of acrylic resin exhibited pronounced impedance modulus (|Z| _(0.01 Hz)) values exceeding 10^10 Ω cm ^2 throughout 60 days of exposure to the corrosive medium, 3.5 wt.% NaCl solution. Moreover, this finding was supported by the breakpoint frequency measurement which showed that the T1 and T5 coating samples performed at a full capacitive region even after 60 days of immersion. From this investigation, it was concluded that the T5 coating sample exhibited optimum results, thus enhancing the overall corrosion protection performance.

Biography

Assoc. Prof. Ir. Ts. **Dr. Sachin Sharma Ashok Kumar** is a material scientist experienced in the development of graphene and graphene oxide nanomaterials incorporated with reinforced composites, supercapattery, batteries, solar cells, fuel cells, hydrogen storage, polymer nanocomposites, corrosion coatings and 3D composites for numerous engineering applications. He received both of his BSc. degree (Hons.) and MSc. (Hons.) in Mechanical Engineering minor in Materials Science from Wichita State University, USA in year 2011 and 2012, respectively. He received his Ph.D. in Advanced Materials Science Engineering in University Malaya in year 2023. His current research involves the synthesis of super-hydrophobic graphene-based polymer nanocomposite coatings for corrosion applications. He has published over 50 articles in various high-ranked ISI/WoS- and Scopus-listed journals, participated in international conferences as a keynote speaker and has received several excellence awards at international/national exhibitions pertaining to his research and inventions. He is currently a member and a Professional Engineer registered with the Board of Engineers Malaysia (BEM) and Institution of Engineers Malaysia (IEM) and a Professional Technologist with Malaysia Board of Technologists (MBOT).

Delia Teresa Sponza

Dokuz Eylul University
Turkey

Photoremoval of some PAHs via Bimetallic NCs of Fe/Ni-K

Abstract:

Catalysts capable of electrochemical overall water splitting in acidic, neutral, and alkaline solution are important materials. This work develops bifunctional catalysts with single atom active sites through a pyrolysis-free route. Starting with a conjugated framework containing Fe sites, the addition of Ni atoms is used to weaken the adsorption of electrochemically generated intermediates, thus leading to more optimized energy level sand enhanced catalytic performance. The pyrolysis-free synthesis also ensured the formation of well-defined active sites within the framework structure, providing ideal platforms to understand the catalytic processes. The as-prepared catalyst exhibits efficient catalytic capability for electrochemical PAH splitting in both acidic and alkaline electrolytes. At a current density of 10 mA cm−2, the overpotential for photodegradation of PAHs.

Biography

Delia Teresa Sponza is currently working as a professor at Dokuz Eylül University, Department of Environmental Engineering. Scientific study topics are; Environmental engineering microbiology, Environmental engineering ecology, Treatment of fluidized bed and activated sludge systems, Nutrient removal, Activated sludge microbiology, Environmental health, Industrial toxicity and toxicity studies, The effect of heavy metals on microorganisms, Treatment of toxic compounds by anaerobic / aerobic sequential processes, Anaerobic treatment of organic chemicals that cause industrial toxicity and wastewater containing them, Anaerobic treatability of wastewater containing dyes, Treatment of antibiotics with anaerobic and aerobic sequential systems, Anaerobic and aerobic treatment of domestic organic wastes with different industrial treatment sludges, Treatment of polyaromatic compounds with bio-surfactants in anaerobic and aerobic environments, Treatment of petrochemical, Textile and olive processing industry wastewater by sonication, Treatment of olive processing industry wastewater with nanoparticles and the toxicity of nanoparticles. She has many international publications with an H index of 43 and 6300 citations.

Shunazia Saquib

QuinTech Sciences
Pakistan

Toxoplasmosis: A common zoonotic parasitic infection responsible for repeated abortions in women

Abstract:

Toxoplasmosis is one of the most successful parasitic infections, caused by the intracellular parasite Toxoplasma gondii. Woman acquiring Toxoplasmosis for the first time during her pregnancy, the disease develops severe parasitemia in mother and life threatening infection to fetus or abortion. Definitive host of T.gondii is cat serving as an important tool for oocysts transmission among human population. 10-50% of cat's owners develop Toxoplasmosis. Cats are exposed to gondii by predation on wildlife or feeding on infected rodents. Once entered the host T.gondii travels to felid intestine and starts sexual reproduction. Human get exposed to Toxoplasma gondii sporulated oocysts by having an accidental contact with contaminated cat feaces. In infected pregnant women, the ingested sporulated oocysts form tissue oocysts in the endometrium of uterus and develop focal lesions in placenta hence fetus gets infected. Primary maternal infection may cause health-threatening sequelae for the fetus, or even cause death in uterus. Clinically, the disease is manifested by high fever, swollen lymph nodes in neck particularly, headache, muscle aches, abortion, still birth and mental retardation of congenitally infected children. Laboratory diagnosis, i.e. PCR and serologic assays, plays the main role in the diagnosis of congenital infection. Treatment usually involves the course of an antibiotic called clindamycin either alone or in combination with corticosteroids. Treatment should ideally be started immediately after the diagnosis and continually for several days after signs have disappeared. In view of the devastating health hazards of Toxoplasmosis, the implementation of effective means for the prevention, diagnosis, and management of this disease should be carried out. A veterinarian should educate the cat owners about importance of in time vaccination of their pets, keeping them indoors and maintaining their health hygiene.

Biography

Shunazia Saquib, Ex-Senior scientific officer, QuinTech Institue of applied Sciences, Lahore, Pakistan, DVM, University of Agriculture Faisalabad, Pakistan, MPhil Pathology, University of Agriculture Faisalabad, Pakistan

Yohannes Shuka Jara
Borana University
Ethiopia

Biosynthesized Nitrogen-Zinc-Codoped Copper Oxide Nanoparticles for Photocatalytic Activity: Bandgap Engineering of Nanomaterials

Abstract:

In the era of science and technology, nanoscience has explored the potential of nanoparticles (NPs) due to their extraordinary properties at nanoscale compared to those of bulk materials. Modifying metal oxide semiconductors through innovative and sustainable approaches is crucial to meet specific requirements for targeted applications. Herein, semiconductor modified N-Zn-codoped CuO NPs was successfully synthesized as highly efficient photocatalyst using Pycnostachys Abyssinica Fresen plant leaf extract as a bioreducing and capping agent for the degradation of methylene blue (MB) under natural sunlight irradiation. Additionally, pure CuO NPs, N-CuO NPs, and Zn-CuO NPs were also biosynthesized for comparison. Characterization via UV Vis, XRD, SEM, and FT-IR revealed that N-Zn codoping narrowed the band gap (1.72 to1.07 eV), reduced the crystallite size (25 to11.23 nm), distorted the monoclinic crystal lattice (rhombus- and diamond-like shapes with an average diameter of 2.25 µm to an irregular shape with an average size of 2.75 µm), and redshifted the Cu O characteristic peaks (617 to 529 cm-1) of CuO NPs, confirming the successful incorporation of dopants into CuO NPs. The effects of key parameters on the photocatalytic degradation efficiency of all biosynthesized NPs were investigated. The optimal conditions for maximum degradation of N-Zn-CuO NPs were a 3% dopant concentration for both N and Zn, a 120 mg photocatalyst dosage, a pH of 11, a 20 ppm initial dye concentration and a 30-minute reaction time. The photocatalytic activity toward MB dye degradation after 30 minutes of exposure to sunlight was 99.75% for the N-Zn-CuO NPs, outperforming that of the pure CuO NPs (95.76%), N-CuO NPs (97.93%), and Zn-CuO NPs (98.26%) under optimal conditions. The enhanced photocatalytic performance of N-Zn-CuO NPs is attributed to their tailored optical properties, leading to improved charge separation and reduced recombination. Kinetic studies revealed a strong fit (R2=0.99799) with the BMG kinetic model for N-Zn-CuO NPs, indicating surface-mediated degradation of MB. Furthermore, the nanocatalysts exhibited excellent reusability and stabil-

ity over four cycles. These findings highlight the potential of biosynthesized N-Zn-CuO NPs as highly efficient, simple, eco-friendly and sustainable solutions for the degradation of organic pollutants.

Biography

Yohannes Shuka is a 29-year-old Ethiopian chemist who graduated with honors with a Master of Science in Physical Chemistry from Hawassa University in 2024. He is currently a PhD candidate at UniME in Italy. Since 2020, he has served as the Chief Lab Chemist and lecturer in Physical Chemistry, conducting research on the theme of "Nanotechnology Applications for Green Development" at Madda Walabu University and Borana University in Ethiopia, respectively. He has received various awards from national and international institutions in recognition of his outstanding academic and research achievements. Yohannes has published seven papers in reputable journals and serves as a member of the editorial board and as a peer reviewer for four journals.

DAY- 02

POSTER PRESENTATIONS

06-07, NOVEMBER 2025

LONDON, UK

Akinsipo Oyesolape

Tai Solarin University of Education
Nigeria

Development of Diosgenin-Incorporated O/W Nanoemulsion for the Transdermal Treatment of Type II Diabetes Mellitus

Abstract:

Type II diabetes mellitus (T2DM) is a chronic multifaceted metabolic condition whose deleterious effect requires urgent alternative therapeutic intervention capable of overcoming conventional oral treatment side effects. This study presents the development of a uniquely formulated Diosgenin- embedded oil-in-water (O/W) nanoemulsion (DGNe) and its transdermal antidiabetic evaluation. A rat model of T2DM was developed using male Wistar rats while DGNe was used in the transdermal treatment of infected rats. The low-energy phase inversion composition method was employed in the DGNe formulation. The effect of STZ and DGNe on rats were evaluated. Routine histopathological examination of the skin, pancreatic tissues, liver, heart and kidney including immunohistochemical expression of insulin receptor and sodium-glucose transporter (SGLT2) were studied. The characteristic surface morphology of DGNe was determined using SEM and FESEM. The functional stability of the formulated DGNe was characterized using FTIR and DLS techniques. An almost spherical nanoemulsion matrix of the dispersed diosgenin was revealed and the DLS analysis indicated particles with size ranging from 92 – 265 nm with a PDI between 0.01 - 0.40. In-vitro drug release studies indicated a slow, continuous and sustained release of drug from 0.5 to 15 h period while signs of skin irritation from DGNe were negligible. Microscopic histopathological reports showed alterations in the physical architecture of examined tissues of diabetic rats. Elevated blood glucose concentration and HbA1c level in STZ-induced rats were significantly reduced in DGNe–treated rats. This study showed the potential of nanoemulsion as an efficient drug reservoir and vehicle, capable of promoting the transdermal delivery of a phytodrug towards treating T2DM.

Biography

Oyesolape Basirat Akinsipo is an accomplished researcher and academic with a Ph.D. in Industrial Chemistry, specializing in Green and Medical Nanotechnology. She is a Senior Lecturer in the Department of Chemical Sciences at Tai Solarin University of Education, Ogun State, Nigeria. Her academic journey has been marked by international recognition, including the prestigious DBT-TWAS Postgraduate Fellowship (2018), which enabled her research residency at Amity University, India. Akinsipo's work has led to the development of innovative, eco-friendly solutions, earning her both national and international patents. In 2023, she was awarded the Green Chemistry Challenge Award Grant by Millipore Sigma, in recognition of her contributions to sustainable chemistry. She is the founder of MoreGreen Plus, a platform promoting green chemistry and nanotechnology education and research. Her expertise extends beyond research, as she actively supports capacity building in science through training, research commercialization, and mentorship programs. She serves as an advisor and program manager for emerging fellowship schemes that empower early-career researchers. Akinsipo also co-hosts global webinars such as the Green Chemistry Connections, fostering international collaboration and knowledge exchange in green chemistry and nanoscience.

Franciely Rufino de Almeida Lima

University of Sao Paulo
Brazil

Synergistic effect of lipid nanoparticles in Brain Tumors: Enhancing antitumor efficacy

Abstract:

The treatment of brain tumors requires innovative therapeutic approaches that enhance efficacy while minimizing adverse effects. In this context, this study aimed to develop lipid nanoparticles (NPs) capable of co-encapsulating antitumor compounds to potentiate therapeutic activity against glioblastoma. The NPs were prepared by hot emulsification followed by sonication and optimized using the Box–Behnken experimental design. The final formulation was evaluated for cytotoxicity in U87MG glioblastoma cells, comparing free and encapsulated forms of the drugs, both individually and in combination. The in vitro study demonstrated that the nanocarrier containing antitumor compounds exhibited high cytotoxic activity, indicating a synergistic effect between the chemotherapeutic agent and the natural product. Additionally, a higher cellular uptake was observed for the encapsulated drugs compared to their free forms, suggesting improved internalization and intracellular action. The combined nanoformulation showed a more pronounced antitumor effect, with synergy confirmed through combination index analysis and isobologram construction. These results indicate that lipid nanoparticle encapsulation enhances drug activity, reduces the concentration required to achieve therapeutic effects, and represents a promising strategy for brain tumor treatment, with potential for improved clinical efficacy and reduced systemic toxicity.

Biography

Franciely Rufino de Almeida Lima is a PhD student in Medicines and Cosmetics at the University of São Paulo – USP. She holds specializations in Pharmacology (UFJF), Biodiversity Drug Innovation (FIOCRUZ), Production Engineering, and Clinical Pharmacy (IBRA). She has experience in developing metallic and biodegradable Nano formulations for cancer and bacterial infections. She completed training in brain nanomedicine at the International School of Nanomedicine in Italy. She is the ambassador of the first Brazilian Nanotechnology Olympiad (ONano) and founder of the first Nanotechnology League at USP. Currently, she is a member of the Young Scientists Committee at CIFARP and the Controlled Release Society (CRS).

Issis Quispe

Universidad de La Serena
Chile

Chitosan combined with pectin extracted from pisco grape pomace for stabilization of their polyphenols via complex coacervation

Abstract:

The increasing demand for natural functional ingredients has driven the search for alternatives to stabilize bioactive compounds such as polyphenols present in Pisco grape pomace. These compounds exhibit instability under environmental factors (light, oxygen, pH), limiting their industrial application. Nanoencapsulation through biopolymer coacervates has emerged as an effective solution for protecting and stabilizing these bioactive compounds. This study aimed to develop a nanoencapsulation system using Pisco grape pomace extracts through coacervates of pectin (extracted from the same pomace) and chitosan, evaluating its potential for agroindustrial waste valorization. Different pectin: chitosan ratios were evaluated to form coacervates, determining Z-potential and particle size for each formulation. Pomace extracts were obtained through enzyme-assisted extraction and pressurized liquid extraction. Encapsulation efficiency was assessed using spectrophotometric techniques to assess the polyphenol content of pisco grape pomace. The optimal pectin: chitosan ratio of 3:2 showed the best physicochemical characteristics for stable coacervate formation. Under these conditions, pomace extracts obtained by both extraction methods were successfully incorporated, achieving encapsulation percentages of 90%. Particle size analysis confirmed the formation of stable nanoparticles with suitable Z-potential values. An efficient nanoencapsulation system was developed that enables comprehensive valorization of Pisco grape pomace, utilizing both its polyphenols and endogenous pectin. The high encapsulation efficiency demonstrates this system's potential to protect bioactive compounds and its application in food, pharmaceutical, and cosmetic industries, contributing to the circular economy and environmental sustainability.

Biography

Issis Quispe Fuentes is a leading scientist in food analytical chemistry, with expertise in recovering and characterizing biomolecules and valorizing food waste. She earned her Ph.D. at the University of La Serena and is a key researcher in the Food Engineering Department. With 39 scientific publications, she has supervised numerous undergraduate and graduate theses and actively participated in national and international conferences. She has led or collaborated on major projects such as FIC, CORFO, FONDECYT, and SATREPS ReBiS.

***Indrajit Mondal**
Jadavpur University
India

Piyali Halder
Jadavpur University
India

Piezo Bio-Nanocomposite membrane for simultaneous organic pollutant degradation and clean energy generation from waste-water

Abstract:

Amidst the growing global energy crisis and environmental degradation, the development of innovative materials that can simultaneously address energy generation and wastewater treatment is crucial [1]. Herein, we have designed a durable, flexible, and reusable composite membrane incorporating chitosan (CHS), one-pot hydrothermally synthesized phosphorene nanosheets (BP), and CTAB-assissted hydrothermally synthesis zirconium oxide (ZO) nanoparticles. This ternary bio-nanocomposite was fabricated using the solvent casting method, and its structural integrity was confirmed through comprehensive characterizations, highlighting the successful integration of polar phases, BP, and ZO. This piezo-responsive membrane demonstrated remarkable energy harvesting capabilities, generating a piezoelectric voltage of 4.1 V and a current of 1.5 µA under the perpendicular flow of water droplets, with a power density of 50 Wm-3. Beyond energy generation, the membrane exhibited superior piezocatalytic activity under ultrasonication, effectively degrading carcinogenic dyes such as methylene blue (MB, 89.93%), Congo red (CR, 99.2%), methyl orange (MO, 82.37%), and a 1:1 MB-CR mixture (76.35%) within 35 minutes. Optimized conditions of alkaline pH, 60 W ultrasonic power, and 2.5 ppm dye concentration further enhanced its degradation efficiency. Field tests demonstrated its practical viability, achieving 96.21% degradation in drinking water and 98.23% in wastewater. Additionally, a water flow-driven piezoelectric catalytic system consumed only 1.2% of the energy required by traditional ultrasonic systems, emphasizing its energy efficiency and scalability for practical applications. Degradation mechanisms were investigated through LC-MS analysis and frontier molecular orbital theory, and reduced ecological toxicity was verified using phytotoxicity assays on tulsi (Ocimum tenuiflorum) plants. The membrane also achieved over 90% degradation of pharmaceutical pollutants like ciprofloxacin and tetracycline within 60 minutes of ultrasonication and displayed over 99% antibacterial activity against both Gram-negative (E. coli) and Gram-positive (E. faecalis). ROS quantification confirmed the synergistic role of BP in enhancing the piezocatalytic performance of the ZO composite membrane compared to membranes with only CHS or CHS-BP.

This novel, multifunctional membrane provides a sustainable solution to the dual challenges of energy scarcity and water pollution. Its energy-efficient, scalable design positions it as a promising candidate for large-scale environmental remediation and renewable energy generation.

Biography

Indrajit Mondal, a Senior Research Fellow at Jadavpur University, and Member of Royal Society of Chemistry, is currently working toward his Ph.D. in Physics. He completed both his B.Sc. (Hons.) and M.Sc. in Physics at the same institution. His doctoral research, supervised by Prof. Pabitra Kumar Paul and Prof. Sukhen Das, involves synthesizing and characterizing Transition Metal Oxide Nanoparticles (TMONPs) decorated Carbon Nanofibers (CNFs) composites for potential materials science applications. With over 19 publications in reputed international journals , his work has received recognition, including the Wiley Best Poster Award at CMMSP-2024, Best Paper Presentation Award at NCFMSP-2024, Best Paper Certificate (1st position) by Royal Society of Chemistry at ICST-2024,Best poster award by Royal Society of Chemistry at ETCSTSI-2025, Best Poster Certificate (1st position) at ISDRC-2025, Best Poster & Third Place in Exhibition Category at VIBHA and honors at research conventions by AIU. He holds qualifications in UGC-CSIR NET, GATE, and WBSET and was awarded the DST INSPIRE Fellowship in 2022.

Piyali Halder, a Senior Research Fellow at Jadavpur University and a DST INSPIRE Fellow (2022-present), is currently pursuing her Ph.D. in Physics under the supervision of Prof. Brajadulal Chattopadhyay and Prof. Sukhen Das. Her research focuses on emerging 2D metamaterials and Nanocomposite, particularly their synthesis, characterization, and industrial applications in energy storage, environmental remediation, and biophysics. She earned her B.Sc. (Hons.) and M.Sc. in Physics from Jadavpur University, securing 66.92% and 77.94%, respectively. With 15 publications in reputed international journals, her interdisciplinary research spans nanomaterials, piezoelectric nanogenerators, supercapacitors, antibacterial applications, and dielectric materials. She has received several accolades, including the Best Paper Presentation Award at NCFMSP-2024, Best Poster Award by the Royal Society of Chemistry at ETCSTSI-2025, Best Poster Award at the Centenary Birth Anniversary Seminar of Prof. Shyamal Sengupta, 1st place at the Eastern Zone Anveshan-2024, and 3rd prize at the International Level AIU Student Research Convention. She is also a Member of the Royal Society of Chemistry (RSC) and actively mentors M.Sc. and Ph.D. students, contributing to both academia and scientific innovation.

DAY- 02

ORAL PRESENTATIONS

06-07, NOVEMBER 2025

LONDON, UK

Anam Saqib

Gourmet Foods,
Pakistan

Effect of Silicon nano particles on Immobilization of Glucoamylase on Nano-Support Materials

Abstract:

The immobilization of glucoamylase enzymes on nano-support materials enhances their stability, reusability, and catalytic efficiency, making them highly suitable for industrial bioprocesses. In this study, glucoamylase from Aspergillus oryzae was immobilized using calcium alginate beads, with and without silica nanoparticle (SNP) coating, to evaluate their functional stability and performance. The optimal enzyme entrapment was achieved using 5% alginate beads, and further reinforcement with 1% SNP significantly improved mechanical strength and reusability. Characterization studies demonstrated that SNP-coated alginate beads exhibited higher activation energy (48.34 kJ mol^{-1} vs. 37.69 kJ mol^{-1}) and improved resistance to thermal inactivation compared to non-coated beads. The immobilized enzyme maintained catalytic activity over a broad pH range (4.5–8.0) with an optimal pH of 6.0. Kinetic analysis revealed enhanced substrate affinity and turnover rates for the SNP-modified beads, indicating their potential for efficient starch hydrolysis. The scanning electron microscopy confirmed the structural integrity of the SNP-coated beads, showcasing their smooth and uniform morphology, which facilitated enhanced enzymatic hydrolysis. The results underscore the potential of nano-engineered enzyme immobilization strategies for improving biocatalytic processes, particularly in industrial starch hydrolysis applications. The enhanced stability and reusability of the immobilized enzyme reduce processing costs, minimize enzyme loss, and improve efficiency in large-scale biocatalysis applications. Furthermore, the use of silica nanoparticles enhances enzyme performance under industrial conditions, making it a promising approach for sustainable and high-yield food processing technologies.

Biography

Anam Saqib has completed his PhD at the age of 34 years from National Institute for Biotechnology and Genetic Engineering (NIBGE), Pakistan and fellowship program at Denmark's Technical University (DTU), Denmark. She is the Head of the Department (HOD)/ Principal Scientist at Quintech Centre for Applied Sciences (QCAS), Lahore, a sister organization and Research Centre for industrial & Fermentation Biotechnology. She has published more than 15 papers in reputed journals and has been nominated as professional trainer for international interns training program under OIC-COMSTECH.

Samira Farjaminejad

City St George's University of London

Multifunctional Nanoparticle-Reinforced Polymer Scaffolds for Enhanced Bone Regeneration

Abstract:

This presentation highlights the development of biodegradable polymer scaffolds reinforced with a combination of nano-hydroxyapatite, nanoclay, and other bioactive nanoparticles to enhance both mechanical and biological performance. The nanocomposites exhibited improved strength, hydrophilicity, and controlled degradation, closely mimicking the structure of natural bone tissue. In vitro evaluations revealed enhanced osteogenic cell proliferation, mineralization, and biocompatibility compared to pure polymers. The synergistic effects of multiple nanoparticles provide a stable and bioactive environment for bone regeneration, making these scaffolds promising candidates for maxillofacial and orthopedic tissue engineering applications.

Biography

Samira Farjaminejad earned her PhD in Biomedical Engineering with research focused on polymeric nanocomposites for bone tissue engineering. She has worked as a lecturer and researcher in biomaterials, regenerative medicine, and drug delivery, and is currently based in London. Her work centers on developing smart scaffolds and nanoparticle systems for tissue regeneration. She has published several papers in international journals, including those by Elsevier and Springer Nature, and serves as a reviewer and editorial board member for reputed scientific journals in the field of biomaterials and tissue engineering.

ACCEPTED PRESENTATIONS

06-07, NOVEMBER 2025

LONDON, UK

Amit Bharti

Panjab University
India

Unravelling the dual photocatalytic behavior of highly luminescent auin nanoclusters for degradation of 4-Nitrophenol and Dye Pollutants

Abstract:

Bimetallic fluorescent nanomaterials have garnered significant attention owing to their superior photoluminescent and catalytic activities. Herein, a novel glutathione stabilized bimetallic AuIn nanoclusters framework were synthesized for the first time via a rapid one-pot microwave-assisted approach, with complete formation achieved within 2 minutes, along with monometallic Au nanoclusters (AuNCs) for comparison. The comprehensive characterization using UV-Vis and Fluorescence spectroscopy, HRTEM, DLS, XPS, FT-IR, EDX with mapping, TGA, and zeta potential analysis which confirmed the formation of uniformly spherical AuIn nanoclusters framework with an average diameter of 125 nm and improved colloidal and thermal stability compared to only AuNCs. The photoluminescence studies revealed significantly enhanced emission for AuIn nanoclusters framework relative to AuNCs. Further, the photocatalytic behavior of novel AuIn nanoclusters framework was evaluated based on two applications, the reduction of 4-nitrophenol and degradation of toxic dyes, including both cationic and anionic dyes such as RhB, MB, MO, CR and RB. The AuIn nanoclusters catalyzed the 4-NP reduction within 60 seconds which is comparatively faster than AuNCs and exhibited superior dye degradation efficiency. The kinetic study confirmed that both processes pseudo first order kinetics. The fluorescent AuIn bimetallic nanoclusters framework demonstrated enhanced photophysical and catalytic activity relative to monometallic AuNCs, demonstrating their potential as emerging platforms for advanced functional nanomaterials in future technological applications.

Biography

Amit Bharti is a research scholar (Ph.D.) in the Department of Chemistry at Panjab University. His research focuses on the design and synthesis of advanced fluorescent metallic and carbon-based nanomaterials with potential applications in catalysis, sensing, and the biomedical field. He also works on the self-assembly of organic and biomolecules and has contributed as a co-author to published research in this area. His objective is to develop novel functional nanomaterials by integrating nanotechnology and supramolecular chemistry, with the goal of advancing the understanding and practical application of nanoscale materials to address complex environmental and technological challenges.

Rajdeep Banerjee

Indian Institute of Technology Kharagpur
India

High Responsivity Short-Wavelength Infrared Phototransistor Based on Black Phosphorus

Abstract:

Short-wavelength infrared (SWIR) phototransistors are vital components in a variety of advanced technologies, including optical telecommunications, and thermal imaging for night vision. Conventional SWIR photodetectors, such as those based on In GaAs, often suffer from lattice mismatch issues that limit their integration with silicon-based integrated circuits and flexible substrates. Black phosphorus (BP), a two-dimensional (2D) material with a layered lattice structure, effectively addresses this limitation, offering excellent compatibility with both silicon and flexible substrates. BP nanosheets, typically 10–20 nm thick, possess a direct bandgap of approximately 0.3 eV and demonstrate significantly stronger infrared absorption than other monolayer 2D materials. These characteristics make BP a highly promising candidate for high-performance infrared photodetectors. In this work, we report a high-sensitivity SWIR phototransistor based on a 26 nm-thick BP flake, operating at a wavelength of 2.2 µm. The flake was mechanically exfoliated onto a silicon substrate, and source-drain electrodes were patterned using electron beam lithography (EBL). The device achieved a high responsivity of 85 A/W and a detectivity of 108 Jones under a low illumination power of 2 nW and a small source-drain bias voltage of -0.6 V. Additionally, a temperature-dependent study of the photo response was conducted across a temperature range of 300 K to 50 K. These results underscore the strong potential of BP-based phototransistors for SWIR detection applications, particularly in weak-light-level scenarios such as biomolecular sensing and thermal imaging.

Biography

Rajdeep Banerjee is a Ph.D. alumnus of the Indian Institute of Technology (IIT) Kharagpur, where his research focused on the first-principles design of nanomaterials, particularly tuning their electronic, magnetic, chemical, and topological properties. Currently based in Kolkata, India, he works as a Lead Data Scientist at IHX, applying his deep scientific knowledge to real-world data analytics and modeling. His academic background bridges advanced computational materials science with practical, data-driven applications. Rajdeep's work continues to contribute to the evolving intersection of nanotechnology and artificial intelligence.

Aide Minerva Torres Huerta

National Polytechnique Institute
Mexico

Optimization of activated carbon-Carbon nanotubes -ZnO nanoparticles to remove organic contaminants in waste-water

Abstract:

In the present work, the obtaining of carbon-based materials is shown, which exhibit physical, chemical, morphological and thermal properties of interest for adsorption applications. To manufacture these materials, it began with obtaining activated carbon (AC) using orange peel (OP) as raw material. The CA from the OP has properties of high surface area and greater porosity than the raw material; In addition, a variety of chemical groups present on the surface. Activated carbon is a versatile material, so the choice of activating agent and activation parameters are chosen depending on the characteristics required according to the application. ZnO nanoparticles were used to modify the activated carbons (AC) and/or commercial multiwalled carbon nanotubes (MWCNTs), in different amounts for the removal of methylene blue (MB) in aqueous solutions. These materials were characterized by XRD, FTIR, BET, TGA, SEM and UV-vis to determine the chemical, structural, and morphological properties and kinetic removal. From the results, it was determined that 20 mg of carbon-based materials can remove up to 89.5±4.47% of MB (80 ppm) after 24 h of exposure at a regulated pH of 8. The equilibrium adsorption data were better fitted by a Langmuir isotherm (R2= 0.9999) than the Freundlich model (R2=0.9366); showing in the best case a maximum adsorption capacity of 1250 mg g-1 for both materials with 30 wt.% of ZnO NPs (AC-MWCTs or MWCNTs). Experimental data also suggest that the most likely mechanism is chemisorption followed by physical adsorption.

Biography

Torres-Huerta complete her Postdoctoral degree at the Institute of Materials -National Autonomous University of Mexico, UNAM (2006-2007). Doctorate in Metallurgy and Materials from ESIQIE -National Polytechnic Institute, IPN (2004), Master of Science with Specialization in Chemical Engineering (1999) and Bachelor's Degree in Industrial Chemical Engineering (1994) from the same institution. Experience in the use of agroindustrial waste, biodegradable polymers and nanomaterials for energy applications, as well as in leadership of technological developments. She has published more than 130 articles reputed journals and has served as member of repute editorial board. She served as director of research and promote innovation at the IPN.

Waqar Mahmood

Rawalpindi Women University
Pakistan

Shape memory alloys for super elastic shape effects

Abstract:

Shape memory alloys (SMAs) are materials that have the capacity to regain their original shape after deformation through the application of heat or stress. The purpose of this research is to create and describe SMAs based on nickel and titanium, as well as to explore the impact of annealing heat treatment on them after cold rolling. The alloy ingot was prepared using metallic Nickel and Titanium strips in a vacuum arc melting furnace operating in an Argon environment. As received, the NiTi alloy was solution treated and then analyzed by FESEM and EDX for microstructure and elemental content. EDX revealed the alloy's elemental composition, which includes 50.14 and 49.86 atomic percent Ni and Ti, respectively. The FESEM picture demonstrated the presence of dendrites in the alloy's microstructure. Cold-rolling of percent NiTi resulted in the formation of a square-shaped rod. The structural and annealing behavior of cold rolled rod was now studied utilizing XRD and DSC. The XRD investigation of the rolled rod identified the presence of two phases in the crystal structure: B2 and B19'. The NiTi rod was annealed for 30 minutes at the temperatures range from 400°C to 800°C with a 100°C increment. The wide and compromised peak of R-phase and martensite on the DSC graph at early annealing temperatures, together with the smaller peak of austenite, indicated that the rod alloy is stressed. Annealing has a Considerable effect on the phase transition response of NiTi SMA. The constant changing of transformation temperatures during annealing demonstrated that tensions were being relieved and the austenitic and martensite plates were becoming free to move in any direction. The annealing hysteresis reduced when the annealing temperature was increased.

Biography

Waqar Mahmood has completed his PhD at the age of 35 years from COMSATS University Islamabad. He is the Associate Professor of Physics at Rawalpindi Women University Rawalpindi a premier education organization. He has published more than 35 papers in reputed journals and has been serving as an editorial board member of repute.

Hiba Shreiki

Tishreen university
Syria

Successful healing of chronic venous ulcer using zinc oxide nanoparticles and compression therapy in a 75-year-old Syrian female: a case report

Abstract:

Introduction: Chronic venous disease is a commonly underdiagnosed condition that gradually diminishes a patient's quality of life and imposes a growing burden on healthcare resources. Venous leg ulcers (VLUs) arise as a complication of chronic venous insufficiency and represent the most prevalent type of slow-healing wound in the lower extremities.

Case presentation: In this case report, we present the successful treatment of a 75-year-old woman with a chronic venous ulcer caused by chronic deep venous insufficiency. The patient had been struggling with an unresponsive venous leg ulcer for 7 years with no improvement from previous treatments. A three-layer Unna boot treatment, including (ZnO NPs) and a two-component compression system was applied, and significant ulcer reduction was observed.

Discussion: ZnO NPs impregnated bandages, like those found in an Unna boot, offer compression by wrapping gauze dressing impregnated with ZnO NPs around the patient's leg forming a semi-solid mold around the extremity. A more efficient treatment approach could lead to fewer clinic visits, thereby reducing healthcare expenses by enhancing the method of managing venous ulcers through a combination of compression and simple, cost-effective surface dressing materials. It's worth noting that ZnO NPs have demonstrated significant benefits for wound healing.

Conclusion: Utilizing ZnO NPs alongside compression therapy has proven highly effective, accelerating healing and offering a cost-effective solution. Further research is needed to study the safety of ZnO NPs.

Biography

Hiba Shreiki has a Bachelor's degree in Pharmacy and Pharmaceutical Chemistry from Latakia University, Syria. Her research interests focus on environmental health, public health, and developing effective solutions in conflict-affected areas. She has experience working as a medical representative for international companies in Syria, which enriched her understanding of healthcare challenges in complex settings. She has published research on nanotechnology and public health, and she is currently engaged in research projects aimed at improving public health education.

O. A. Ajibade

University of Lagos
Nigeria

The Development of Calabash (Lagneria siceria) Particles Reinforced Epoxy Resin Composite for Thermal Insulation

Abstract:

In this study, calabash particles were used as a reinforcement to develop epoxy resin composites for thermal insulation purposes. The calabash particles were ball-milled and divided into two parts. One part of the calabash particle was treated with 10% w/v of NaOH for 24 hours (Alkaline treatment) while the other part of the calabash particle was left untreated and sieved to 150µm particle sizes. The Alkaline treatment was performed to remove impurities from the calabash particles and enhance the interfacial fiber-matrix bonding between the calabash particles and the epoxy resin. The composite was developed using the top-down approach. Different properties of the developed composites were evaluated using tensile, flexural, density, water absorption, thermal conductivity, specific heat capacity, thermal diffusivity tests, and Scanning Electron Microscopy (SEM). The results obtained showed that the 10% NaOH alkaline treatment for 24 hours was sufficient to remove impurities from the calabash particles and enhanced the interfacial-matrix bonding. The treated sample with 5 wt% has the highest tensile strength of 13.055 MPa. The Thermal Conductivity result of the treated sample of 5 wt% composition has a better thermal conductivity of 0.095 W/mK, indicating that the newly developed composite has lower thermal conductivity than epoxy resin. The developed composites exhibited good mechanical and thermal properties, making them ideal for thermal insulation applications in the building industry. The use of sustainable and renewable materials, such as calabash, in building construction can promote sustainable development.

Biography

O.A. Ajibade has developed research expertise in developing novel composite materials for target applications by utilizing and harnessing the inherent properties abundantly found in natural agro-waste fibres, polymers, and production techniques. He also has a keen interest in carrying out optimization of processes using the Taguchi method and Grey Relational Analysis (GRA) to achieve efficiency and peak product performance. He holds a lecturing position in the Department of Metallurgical and Materials Engineering at the University of Lagos, Nigeria.

Yasmina Sebbane

University of Science and Technology
Algeria

Impact of thermal aging on dielectric and physicochemical properties of MV XLPE cables

Abstract:

This work explores the impact of thermal aging on the dielectric and physicochemical properties of medium-voltage XLPE cables, with particular attention to cable structure. Complete cable sections and isolated extruded insulation, manufactured by ELSEWEDY ELECTRIC, were aged at 80 °C and 100 °C for 5000 h and at 140 °C for 1500 h. Broadband dielectric spectroscopy showed increasing dielectric losses (tan δ) with aging severity; complete cables generally exhibited higher low-frequency losses attributable to interfacial polarization at insulation–semiconductor boundaries absent in extruded samples. Fourier-transform infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC) indicated progressive oxidative degradation and reduced crystallinity with temperature. Scanning electron microscopy coupled with energy-dispersive X-ray spectroscopy (SEM-EDS) revealed thermally induced surface micro-cracking and oxygen enrichment most pronounced after 140 °C exposure linking morphological damage and chemical oxidation to electrical response. Taken together, the results demonstrate that evaluating full cable architecture, rather than isolated materials alone, is essential for realistic condition assessment and lifetime prediction of XLPE-insulated medium-voltage cables operating under thermal stress.

Biography

Yasmina Sebbane is an Assistant Professor (MCB) at the University of Science and Technology Houari Boumediene (USTHB), Algiers. She earned her Electrical Engineering degree from the National Polytechnic School of Algiers (ENP), a Master's in PIE from ENS in 2015, and a PhD in Electrical Engineering from ENP in 2023. Her research focuses on the thermal aging, water adsorption, and multi-scale characterization of power cables, linking physicochemical, mechanical, and dielectric properties. She has published in journals such as ENPESJ and TDEI, and presented her work at several national and international conferences, contributing to advancing knowledge in cable insulation.

Yibeltal Addis Mekuria

Arba Minch University

Spatial variation and determinants of skilled birth attendant delivery among women of reproductive age in Ethiopia: A spatial and multilevel analysis

Abstract:

Background: Delivery assisted by skilled birth attendants is essential for maternal and newborn health because most maternal and infant deaths occur during childbirth. Ethiopia continues to use skilled birth care services that are far below acceptable standards. There are also regional variations in skilled birth attendant delivery services in the country. Therefore, this study explored the spatial distribution and factors associated with the use of skilled birth attendants in Ethiopia based on nationally representative EMDHS 2019 data.

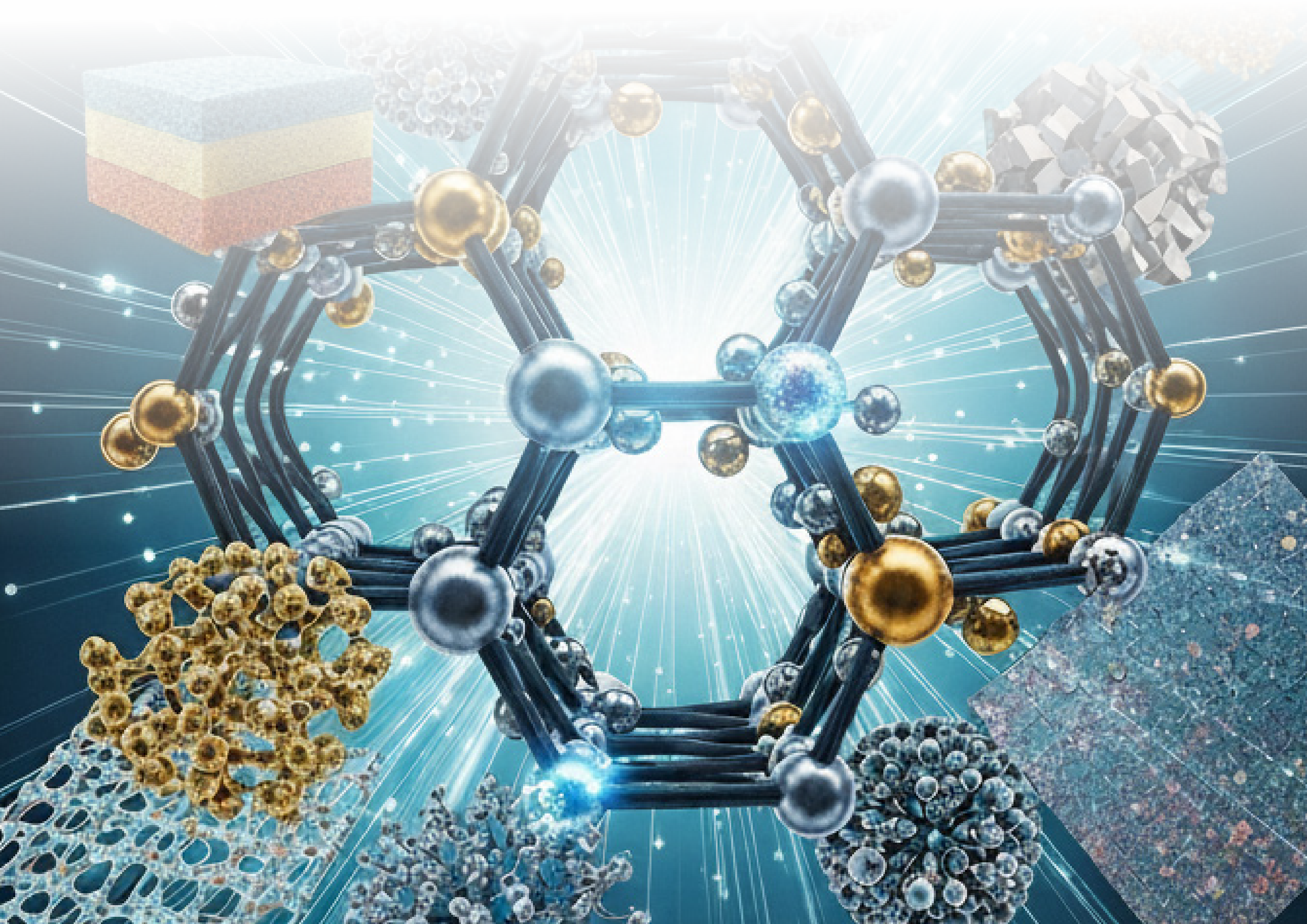
Methods: This study included a weighted sample of 5,527 women who had given birth within the 5 years prior to the survey year. ArcGIS version 10.7 was used to visualize the geographic variations, and Kulldorff's SaTScan version 9.6 was used to identify significant purely spatial clusters. A multilevel mixed-effects logistic regression model was fitted to identify determinant factors of skilled birth attendant delivery using STATA 17.

Results: The number of women who delivered with the assistance of skilled birth attendants was 2,740 (49.6%) and distributed non-randomly across the regions of the country. Low clustering of skilled birth attendant delivery was detected in the Afar, Amhara, Benshangul-Gumuz, Gambela, Oromia, and Somali regions, whereas high clustering was detected in the Addis Ababa, Dire Dawa, and Harari regions. Maternal education level, parity, wealth index, region, place of residence, and community poverty level were significant predictors of skilled birth attendant delivery.

Conclusion and recommendation: Skilled birth-assisted delivery remains below national and international acceptable standards and is associated with geographic variation across the country. If it continues at the current pace, it will be difficult to achieve national and international targets. Therefore, a geographic-specific intervention should be launched by the government and respective local administrators, supported by local research in regions with low-skilled birth attendant delivery, to tackle individual and aggregate community-level determinants.

Biography

Yibeltal Addis Mekuria has a Bachelor of Science in Health Informatics from the University of Gondar and a Master of Public Health in Health Informatics from Bahir Dar University. With a strong public health background, he is passionate about integrating technology into healthcare systems to improve healthcare outcomes and service delivery. His efforts have resulted in published papers and have contributed to advancing knowledge in the field. He is dedicated to continuous learning and always seeks opportunities to expand his knowledge and contribute to improving healthcare. Looking ahead, he aspires to continue advancing in the field of health informatics by researching new technologies and methodologies that can further enhance **healthcare outcomes, education, and research.**



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ISSN: 3068-3505 Journal of Environmental Toxicology Research

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3RD INTERNATIONAL CONFERENCE ON
PEDIATRICS & NEONATOLOGY
NOVEMBER 27-28, 2025 | PHILADELPHIA, USA

4TH INTERNATIONAL CONFERENCE ON
GYNECOLOGY AND OBSTETRICS
NOVEMBER 27-28, 2025 | PHILADELPHIA, USA

FEBRUARY - CONFERENCES

INTERNATIONAL CONFERENCE ON
FINANCE, BUSINESS AND STOCK MARKET
FEBRUARY 10-11, 2026 | TORONTO, CANADA

MARCH - CONFERENCES

3RD WORLD CONGRESS ON PHYSICAL
MEDICINE AND REHABILITATION
MARCH 26-27, 2026 | OSAKA, JAPAN

3RD INTERNATIONAL CONGRESS ON
PSYCHOLOGY & BEHAVIORAL SCIENCES
MARCH 26-27, 2026 | OSAKA, JAPAN

INTERNATIONAL CONFERENCE ON
HEALTHCARE AND ADVANCED NURSING
MARCH 26-27, 2026 | OSAKA, JAPAN

APRIL - CONFERENCES

3RD INTERNATIONAL CONFERENCE ON
DERMATOLOGY & SKINCARE
APRIL 16-17, 2026 CHICAGO, USA

MAY - CONFERENCES

3RD EUROPEAN CONFERENCE ON
DENTISTRY AND ORAL HEALTH
MAY 20-21, 2026 | BARCELONA, SPAIN

3RD GLOBAL SUMMIT ON
NURSING AND MIDWIFERY
MAY 20-21, 2026 | BARCELONA, SPAIN

JUNE - CONFERENCES

3RD INTERNATIONAL CONFERENCE ON
OPHTHALMOLOGY & VISION SCIENCE
JUNE 04-05, 2026 PARIS, FRANCE

3RD INTERNATIONAL CONFERENCE ON
OBESITY AND WEIGHT MANAGEMENT
JUNE 04-05, 2026 | PARIS, FRANCE

AUGUST - CONFERENCES

5TH INTERNATIONAL CONFERENCE ON
GLOBAL ENTREPRENEURSHIP SUMMIT
AUGUST 19-20, 2026 TORONTO, CANADA

3RD INTERNATIONAL CONFERENCE ON
ARTIFICIAL INTELLIGENCE IN HEALTH-CARE AND INDUSTRY
AUGUST 19-20, 2026 TORONTO, CANADA

SEPTEMBER - CONFERENCES

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COPD AND PULMONARY DISEASES
SEPTEMBER 09-10, 2026 | BARCELONA, SPAIN

OCTOBER - CONFERENCES

4TH INTERNATIONAL CONFERENCE ON
INNOVATIONS AND ADVANCES IN CANCER RESEARCH AND TREATMENT
OCTOBER 08-09, 2026 | TOKYO, JAPAN

WORLD CONGRESS ON AUTISM RESEARCH & INNOVATION
OCTOBER 15-16, 2026 | PARIS, FRANCE

3RD INTERNATIONAL CONFERENCE ON
OPTICS AND LASER TECHNOLOGY
OCTOBER 29-30, 2026 | BERLIN, GERMANY

NOVEMBER - CONFERENCES

WORLD CONGRESS ON
CLINICAL AND EXPERIMENTAL DERMATOLOGY
NOVEMBER 05-06, 2026 | DUBAI, UAE

2026

4TH INTERNATIONAL CONFERENCE ON
SURGERY AND ANESTHESIA
NOVEMBER 26-27, 2026 | DUBAI, UAE

5TH INTERNATIONAL CONFERENCE ON
PRIMARY HEALTH CARE
NOVEMBER 26-27, 2026 | DUBAI, UAE

NOTE

Upcoming Conferences

We wish to engage with you again in 2026...

3rd World Congress on

Nanotechnology

October 29–30, 2026 | Berlin, Germany

https://www.scitechseries.com/nanotechnology

&

3rd Global Event on

Materials Science and Engineering

October 29–30, 2026 | Berlin, Germany

https://www.scitechseries.com/materials-science

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