EuroSciCon

DAY 1

Scientific Tracks & Abstracts

2nd European Congress on

ADVANCED CHEMISTRY

May 09-10, 2019 | Stockholm, Sweden

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Sessions

Medical Biochemistry | Advancements of Organic Chemistry | Materials chemistry | Medical Biochemistry | Chemistry Education | Electrochemistry

Session Chair
Essen N. Suleimenov
Kazakh-British Technical University, Kazakhstan

Session Introduction

Title: Advances in determination of Alzheimer's β-amyloid peptide
Yanli Zhou, Shangqiu Normal University, China

Title: Advanced materials chemistry for rechargeable potassium-ion battery
Titus Masese, National Institute of Advanced Industrial Science and Technology, Japan

Title: Synthesis and anticonvulsant activity of 5-methoxy-5, 6-dihydro-4H-benzo[f] [1, 2, 4]triazolo[4,3-a] azepine derivatives
Feng-yu Piao, Yanbian University, China

Title: Isolation, thermal reaction and application of curcumin
Manal Y. Sameeh, Al Leith University College, Saudi Arabia

Title: A dicyanoisophorone-based highly sensitive and selective near-infrared fluorescent probe for sensing thiophenol in water samples and living cells
Yuanqiang Hao, Shangqiu Normal University, China

Title: Organization of unusual and combined chemical reactions to extract metals from refractory ores
Sharipov Rustam Hasanovich, Kazakh-British Technical University, Kazakhstan

Title: Antibacterial activity evaluation of cationic surfactants in the series of (N-(n-hydroxyalkyl)-N, N-dimethyl n-alkyl ammonium bromide): a theoretical approach by the docking study
Zakaria Hafidi, Mohammed V University, Morocco

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ADVANCES IN DETERMINATION OF ALZHEIMER'S β-AMYLOID PEPTIDE

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Alzheimer's disease (AD), as the most common progressive neurodegenerative disorder, is pathologically characterized by deposition of extracellular plaque composed of amyloid-β peptide (Aβ). Therefore, the development of reliable assays for Aβ (both monomers and oligomers) are important for the early differential diagnosis of dementia, predicting the progression of AD, as well as monitoring the effectiveness of novel anti-Aβ drugs for AD. Recently, our group has constructed several analytical assays for sensing Aβ (both monomers and oligomers): by using aptamer- and thionine-modified gold nanoparticles (aptamer-Au-Th) as the signing probe, we fabricated an antibody-aptamer sandwich assay for electrochemical evaluation of levels of β-amyloid oligomers; based on metal–organic frameworks as electrochemical signal probes, we developed a sensitive aptasensor for the detection of β-amyloid oligomers; based on the target-mediate aggreation of gold nanoparticle, we constructed a sensitive colorimetric assay for β-amyloid oligomers; based on the specific binding between Cu^{2+} and $A\beta_{1-40}$, we proposed a colorimetric assay as well as a fluorescent assay for $A\beta_{1-40}$ monomer.

Biography

Yanli Zhou has completed her PhD at the age of 27 years from the Technical Institute of Physics and Chemistry, Chinese Academy of Sciences. She is currently a professor at Shangqiu Normal University. She has published more than 40 papers in reputed journals.

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ADVANCED MATERIALS CHEMISTRY FOR RECHARGEABLE POTASSIUM-ION BATTERY

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Advanced rechargeable potassium-ion (K-ion) batteries are a new generation of battery systems and are deemed not only as lucrative low-cost battery alternatives to the current lithium-ion (Li-ion) technology but also as high voltage energy storage systems. The development of a K-ion battery with comparable performance as Li-ion battery is, however, a challenge because of the higher mass and larger ionic size of K-ion than that of Li-ion, which makes it difficult to identify materials (particularly cathodes) that can facilitate reversible insertion of the large K-ions at high voltages and reasonable capacities. In this talk we will highlight our recent progresses in developing materials for rechargeable K-ion batteries, through the screening of the broad minerals and compounds database relating to potassium-based materials aided with computational chemistry. We believe that materials exploration through computational chemistry will serve as a cornerstone for new research opportunities in the development of practically-usable and low-cost K-ion battery chemistries using ubiquitous potassium-containing materials.

Biography

Titus Masese has received his BS, MS and PhD degree from Kyoto University. He is currently a Research Scientist at the National Institute of Advanced Industrial Science and Technology (AIST) located in Japan. His research interests include the synthesis and physicochemical characterisation of novel functional materials for potassium, sodium, magnesium, calcium and advanced lithium-ion batteries. He has filed more than 30 patents and has published more than 25 papers in reputed journals.

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SYNTHESIS AND ANTICONVULSANT ACTIVITY OF 5-METHOXY-5, 6-DIHYDRO-4H-BENZO[F] [1, 2, 4] TRIAZOLO [4,3-A] AZEPINE DERIVATIVES

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Series of novel 5-methoxy-5,6-dihydro-4H-benzo[f][1,2,4]triazolo[4,3-a]azepine derivatives were synthesized from 3,4-dihydronaphthalen-1(2H)-one. The structures of these compounds were confirmed by IR, ^{1}H NMR, ^{13}C NMR, MASS spectra and elemental analysis. Their anticonvulsant activity was evaluated by the maximal electroshock (MES) test, subcutaneous pentylenetetrazol (scPTZ) test, and their neurotoxicity was evaluated by the rotarod neurotoxicity test. The results of these tests showed that compound 4-hydroxyl-1, 3, 4, 5-tetrahydro-2H-1-benzazepin-2-one had moderate anticonvulsant activities, with median effective dose (ED_{50}) of 44.0 mg/kg, and protective index (PI) value of 6.4 in the MES test. However, this compound did not show anticonvulsant activity at the 100 mg/kg dose level in the scPTZ test. The level of competition between the elimination reaction and nucleophilic substitution reaction was discussed.

Biography

Feng-yu Piao, Yanbian University Professor, She has published more than 12 papers in reputed journals.

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ISOLATION, THERMAL REACTION AND APPLICATION OF CURCUMIN

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Turmeric belongs to the Ginger Family. It has revealed numerous medical studies about the importance of turmeric in the treatment of a large number of illnesses beginning of cancers, leading to Alzheimer disease. This study investigates the best methods to isolate, purify and identify the chemical composition and the important biological activity of turmeric. The turmeric was bought from market. The plant used in research was classified as Turmeric (*Curcuma longa L*). The percentage of moisture in the dried samples was assessed. The results showed that the moisture content of turmeric tubers was 12%. Various compounds of dry turmeric rhizomes were extracted by ethanol, GC-MS analysis was performed for this extract which showed the presence of a large number of compounds belonging to different types of terpenes and aromatic compounds. The largest component of these compounds was turomene (19.0%), zingiberen (17.0%) and curcumin (20%). Isolation of curcumin from ethanolic extract was done. Curcumin epoxide was synthesized by using mcpba thermally. Antifungal activity of the new compound curcumin epoxide was studied against the fungi *(Candida albican, Aspergillus parasiticus, Fusarium proleferatum, Penicillium verrucosum and Aspergillus niger)* and the results were highly positive.

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Biography

Manal Y sameeh has completed her PhD from King Abdullziz University and Postdoctoral studies from Umm Al-Quara University. She is the Head of Chemistry Department. She has published more than ten papers in reputed journals and has been serving as an Editorial Board Member of repute.

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A DICYANOISOPHORONE-BASED HIGHLY SENSITIVE AND SELECTIVE NEAR-INFRARED FLUORESCENT PROBE FOR SENSING THIOPHENOL IN WATER SAMPLES AND LIVING CELLS

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Thiophenol (C_6H_5SH, PhSH) is a widely used aromatic organosulfur in organic synthesis and in industrial chemistry. Therefore, facile and effective detection of this irritant and toxic compound is highly desired for environmental monitoring and assessment. Herein, we reported a novel near-infrared (NIR) probe (1) for fluorescence turn-on detection of PhSH. The probe was obtained by coupling 2, 4-dinitrophenyl (DNP) to a hydroxy-substituted dicyanoisophorone based D–π–A fluorophore. PhSH can specifically mediated a nucleophilic aromatic substitution (SNAr) reaction with probe 1 to release the D–π–A fluorophore, thus achieving a dramatic turn-on NIR fluorescence response (~200 fold, λ_{em}=693 nm) and a dramatic colour change of the probe solution from red (λ_{abs}=524 nm) to blueness (λ_{abs}=668 nm). This fluorescent assay based on probe 1 displayed a large Stokes shift (~133 nm) and a high sensitivity for PhSH sensing with a low detection limit of 34 nM. Moreover, probe 1 was successfully applied to monitor PhSH in real water samples as well as imaging PhSH in living cells.

Biography

Yuanqiang Hao has completed his PhD at the age of 29 years from Central South University. He is currently an associate professor at Shangqiu Normal University. He has published more than 30 papers in reputed journals.

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ORGANIZATION OF UNUSUAL AND COMBINED CHEMICAL REACTIONS TO EXTRACT METALS FROM REFRACTORY ORES

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In the 20th century, a huge amount of experimental material was accumulated that confirms the correctness of M Faraday's views on the effect of electric current on chemical reactions. Key moments and main theses of M Faraday's works: identity of energy manifestations in the interaction of material objects; the discrete nature of the electric current. The concept of the discrete nature of electric current allows the use of a combination of electric current parameters to organize unusual chemical reactions. The provision on the identity of energy manifestations in the interaction of material objects provides the basis for revising the scientific provisions on the mechanism of heat exchange between material objects. A method has been developed for using combined electrochemical reactions to obtain a leaching agent and extract metals into a solution from mineral raw materials in the volume of a single reactor. In the course of the research, a sodium hydroxide solution served as the starting solution for the reactions. A sulfur-graphite electrode was used as a source of sulfur for the preparation of reagents. When extracting metals into solution, it was shown that virtually all physicochemical factors influence the leaching process and the microstructure of inorganic aqueous solutions should be considered as one of the important parameters of the technological process. In particular, the pH of the initial and productive solutions changes with temperature. For productive solutions, this change is not reversible. It is shown that surface tension decreases with increasing sodium hydroxide concentration. The degree of extraction of copper in the electroleaching of the concentrate - 1 for 6 hours is at 0.1 M sodium hydroxide 21.5%, 0.2 M - 30.04%, 0.5 M - 43.1%, 1.0 M - 46 3%. With an increase in temperature to 450°C, copper recovery increases from 26.8% to 35.7%.

Biography

Sharipov Rustam Hasanovich has studied at the Kazakh National Technical University named after KI Satpayev in the Specialty Metallurgy from 2005 to 2009. He has studied at the on the Specialty Material Science and Technology of New Materials from the same University from 2005 to 2009. He has worked in the National Center for Complex Processing of Mineral Raw Materials of the Republic of Kazakhstan in the Laboratory Technology of Electrochemical Productions as an Engineer-Researcher from 2009 to 2013. He has studied in the Graduate School of the Kazakh-British Technical University with a Degree in Metallurgy. Currently, he is working as a Research Assistant at the Advanced Materials and Technologies Laboratory at the Kazakh-British Technical University.

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ANTIBACTERIAL ACTIVITY EVALUATION OF CATIONIC SURFACTANTS IN THE SERIES OF (N-(N-HYDROXYALKYL)-N, N- DIMETHYL N-ALKYL AMMONIUM BROMIDE): A THEORETICAL APPROACH BY THE DOCKING STUDY

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Some quaternary ammonium from amino-alcohols and n-bromoalkanes, referred to as C_{14}EtOH, C_{14}PrOH and C_{14}iPrOH, (where EtOH = ethanol, PrOH = propanol, iPrOH = iso-propanol) have been synthetized. Their structures were checked by the usual spectroscopic methods (^{1}H, ^{13}C NMR and IR and RX) and their physicochemical properties in aqueous solution have been studied by surface tension and conductivity measurements. The assessment of their antibacterial activity in water was made against three bacterial strains *Escherichia coli (E coli), Staphylococcus aureus (S aureus), and Pseudomonas aeruginosa* (*P aerug*). The values of inhibition zone (IZ), Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) were evaluated in terms of two structural factors such as the lengthening of the hydrophobic chain carbon atoms and the location of OH alcoholic function with respect to quaternary ammonium, N+. The location OH group shows its influence on the availability of N+ which is responsible for the electrostatic interactions with bacterial cell walls. The theoretical binding mode of the target molecules was evaluated by docking studies against the enzyme Dehydrosqualene synthase (CrtM) (PDB = 3ACX). The DFT method was made to understand the effect of the degree of molecular electrophilicity in the inhibition process of three types of cationic surfactants against two bacterial strains Gram-negative types *Escherichia coli (E coli) and Pseudomonas aeruginosa* (Pseudo). The membrane surface of Gram-positive bacteria is generally negatively charged due to the presence of lipopolysaccharide group, therefore a number of descriptors were calculated by of B3LYP/6 -31 G (d) method for the three inhibitors in their monomer state (below CMC(critical micellar concentration) in the aqueous medium, the examination of these descriptors reveals that the C_{14}EtOH molecules is the best inhibitor which has an ability to accept an electron from the bacterial walls negatively charged following the C_{14}IPrOH and C_{14}PrOH.

Biography

Zakaria Hafidi has completed his Bachelor's from Ibn Zohr University of Agadir and MSc from Mohammed V University of Rabat. He is currently pursuing his Doctorate in Organic Chemistry: synthesis of new quaternary ammonium surfactants and their potential use.

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