Contents

About An-Najah National University

An-Najah National University is a fully independent, non-governmental university, run by the Board of Trustees and the University President. The structure of the administration is composed of the University President, Assistant and Vice Presidents, University and Deans Council, Administrative Departments, and the University Comptroller. The academic structure divides Faculties into academic departments.

An-Najah seeks to provide as many opportunities as possible to its students, through providing each Faculty and Department with a computer lab for students use. This has created a ratio of three students to each computer. Physically challenged and visually impaired students are welcomed at An-Najah. A special computer lab designed for the visually impaired converts all Microsoft Office files to Braille to allow students to share lectures, submit assignments either by email or through the Braille printers available. The University also allocates special cars to transport physically and visually impaired students between campuses.

An-Najah University hosts more than 20 scientific centers that offer a wide range of services to the local society. Among those are two centers that are directly connected with the local society and seek to provide high services to the people in various parts of the country. The first one is the Community Service Center which is involved in numerous projects to help the people of Nablus and the Northern West Bank. The Community Service Center also collects blood samples from the community for transfusions and also provide hot meals to the elderly and needy families in Nablus. The Housing Program in the CSC in 2008 partnered with the YMCA, the UN, and the community of Nablus to help a young girl in need. Lara lived with her family on the 3rd floor of their apartment building, which did not have a lift. She is physically challenged and this required one of her family members to carry her and her wheelchair up and down the stairs to be able to attend school. The solution the Housing Program hit upon was to build a ramp and a bridge that would run from the flat out to the hillside road next to the building. The success of this project has allowed Lara to wheel herself down the ramp directly onto the road without the assistance of her family.

In addition to the Community Service Center there is the Energy Research Center (ERC) which undertakes research in the field of energy and has accomplished a number of projects in many Palestinian cities and villages as in Attouf Village which the Center provided with electricity through harnessing solar power for the first time.

To connect to the community, An-Najah has its own radio station, and a soon to be completed satellite television station. Both these programs provide practical training for An-Najah's students as well as provide an avenue to connect to the community of Nablus and soon the international community through the satellite station. To reach more students, videoconferences and e-learning lectures are both organized at An-Najah. The e-learning lectures are available for free on the school's website. Videoconferences have been organized between other academic, non-profit, and private institutions to communicate the academic and political situation to outside parties.

Message

Welcome Message by Prof. Rami Hamdallah

It is with great pride that I welcome you to the Fifth Palestinian International Conference in Chemistry and An-Najah National University. This conference will not only deliver current research across the scientific spectrum, but will bring together industry leaders, academics and policy makers for meaningful dialogue. By bringing scholars and scientists together from across the region this conference is designed to be broad in scope, vivid in material and grounded in relevance.

An-Najah National University is a premier institution in the region, having earned international acclaim for its academic offerings, research capabilities and civil development projects. Our four campuses provide state-of-the-art facilities for around 20,000 students currently enrolled in 20 distinct faculties. The university offers 71 Bachelor degree programs, 38 Master's degrees and the only doctorate in Palestine, a PhD in Chemistry. These academic offerings are complimented by the University's Scientific Centers which focus on providing technical innovations and social programs for the people of Palestine. Much of this work is focused on sustainable development and utilizes interdisciplinary approaches to address critical issues such as renewable energy, environmentally ethical agriculture, and water treatment.

The importance of chemistry in sustainable development is not a recent occurrence. For the whole of its existence, chemistry has sought ways to improve the human condition. Today, we stand at the precipice of a new world, with both the successes and challenges that it brings. Perhaps of greatest importance among these challenges is how we will provide the food and energy for a growing population. Yet we already see the potential for chemistry in alleviating these concerns. Within our lifetime, solar power can become more cost effective than fossil fuels and new fertilizers will improve plant growth and food production. Breakthroughs such as these do not occur because of single person, compound, or process but are the synthesis of research and application across academia and industry. This conference is poised to be such a catalyst for innovation. Drawing from topics as diverse as nanotechnology, polymers and theoretical chemistry, student and professional presenters will showcase research of both commercial and academic value. Just as chemistry represents the foundation of modern science and technology, this conference is the base from which we can build a better Palestine and world as a whole.

This conference is a testament to An-Najah National University's motto, "We challenge the present to shape the future." Using existing knowledge and scientific principles, we can radically change our worldview and the way we interact with the environment. I extend my warmest welcome to you on behalf of Nablus, An-Najah National University, and the Fifth Palestinian International Conference in Chemistry and look forward to a future built on the work presented here.

Finally, I would like to take this opportunity to thank the PICC sponsors: Cellular Communications Company (Jawwal), Dar-Alshefa for pharmaceutical industry, Al- Zahra company for Food and Beverage, Sun Pharm company for raw materials and Omega company for raw materials.. My deep appreciation for the intensive work done by the organizing committee and for those who made this conference possible.

Prof. Rami Hamdallah
President

Message

Welcome and Overview by Conference Organizing Committee Chairman

Dear colleagues and participants,

I welcome you at An-Najah National University, the university which has become in addition to its excellence in teaching, the leading Palestinian research institution. We pride ourselves in our distinguished researchers and educators and we are happy to disseminate information to interested researchers through the different conferences that we host and sponsor. It is a great honor that the 5th Palestinian International Conference (5th PICC 2011) is organized by the Chemistry Department at An- Najah National University in association with the Chemistry Departments and all other Palestinian Universities in Palestine in joint cooperator with Pan-Arab and International Chemical institutes.

We see the United Nation International year of Chemistry (IYC 2011) as an ideal opportunity to engage and spine people in Chemistry. This is a great opportunity to tell the people of Palestine about The Chemical Sciences, their importance, their relevance to people's daily life and to Palestinian economy. For this reason we are organizing this conference under the title "The Chemical Science Towards Sustainable Development".

The conference will bring together academics, experts from the industrial sector and educators from the local communities to present their latest development in all fields of chemistry with the focus on various issues that play a significant role in building a brighter future for industries in Palestine.

The main objective of the conference:

- Drawing plans to establish effective network between academia and industry.
- Drawing practical and feasible plans toward sustainable social and economic development in Palestine, while emphasizing the role of chemistry in technological advancement.
- Drawing plans to achieve technology transfer to Palestine, showing necessary educational and scientific platforms that guarantee success and easy access to information.
- Supporting technologies of key importance in specialty commercials: pharmaceutical, paints, food, cosmetics, detergents etc..

The successful organization of PICC has required the talents, dedication and time of many volunteers and a strong support from sponsors. First, I would like to thank his Excellency Professor Rami Hamdallah the President of An – Najah National University and the chairman of the conference for his valuable support for the scientific research in the University in general and to the faculty of science in particular and his support for the conference. PICC is sponsored by Cellular Communications Company (Jawwal), Dar-Alshefa for pharmaceutical industry, Al- Zahra company for Food and Beverage, Sun Pharm company for raw materials and Omega company for raw materials. Special gratitude and appreciation is due to the various committees and as they are primarily responsible for the success of the conference program. I also would like to acknowledge the role of The Public Relations Department in the excellent preparation of the conference site.

Finally, I would like to welcome all participants from all over the world and from Palestine who came to take part in this conference. We are especially honored to have Professor Omar Yaghi (Depart. of Chem. and Biochem, UCLA, USA), Dr. Adnan Mjalli, (Chairman, President & CEO TransTech Pharma, Inc. High Point, NC), Dr. Mark H. Rümmeli (Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden, Group Leader: Molecular Nanostructure,Dresden, Germany), and Prof. J. Shashidhara Prasad (Vice-Chancellor Vice-Chancellor , Sri Sathya Sai Institute of Higher Learning, India as our keynote speakers.

Message

We hope that you will find the conference both enjoyable and valuable, and also enjoy the architectural and natural beauty of Nablus and Palestine.
I welcome you and I will be looking forward to your contributions and recommendations.

Thank you
Dr. Sulieman Al-Khalil, C.CHEM, M.R.S.C, FIBMS
Chairman, Organizing Committee
Dean of Faculty of Science

Committees and Boards

International Advisory Board (IAB)

Prof. Adnan Majili	Chairman &CEO, TransTech Pharma Inc ,USA
Prof. Atta-ur-Rahaman	FRS, Patron, International center of Chemical and biological Science, Pakistan
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Committees and Boards

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Committees and Boards

Organizing Committee

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- **Dr. Samar AlShakhshir** — Chairman of Department of Chemistry, An-Najah National University
- **Dr. Nidal Zatar** — Associate Prof. in Analytical Chemistry, An-Najah National University
- **Dr. Othman Hamed** — Associate Prof. in Organic Chemistry, An-Najah National University
- **Dr. Shehdeh Jodeh** — Head of Chemical, Biological and Drugs Analysis Center, An-Najah National University
- **Dr. Ibrahim Abu Shqair** — Assistant Prof. in Analytical Chemistry, An-Najah National University
- **Dr. Mohammed Suleiman** — Assistant Prof. in Material Science, An-Najah National University

Committees and Boards

Scientific Committee

Othman Hamed : Chair

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- **Shehdeh Jodeh** — An-Najah National University, Nablus, Palestine
- **Nizar Mattar** — An-Najah National University, Nablus, Palestine
- **Ibrahim Abu Shqair** — An-Najah National University, Nablus, Palestine
- **Sameer Bsharat** — Al-Kodourie University, Tulkarm, Palestine
- **Iqab Adel** — Arab American University in Jenin, Jenin, Palestine
- **Alfred Francis Abed Rabbo** — Bethlehem University, Bethlehem, Palestine
- **Mohammed Al- Noori** — An-Najah National University, Nablus, Palestine
- **Waheed Jondi** — An-Najah National University, Nablus, Palestine
- **Emad Odeh** — Al-Quds University, Abu Dees, Palestine
- **Mohammed Musmar** — An-Najah National University, Nablus, Palestine
- **Numan Malikieh** — Jerusalem Pharmaceutical company, Ramallah, Palestine
- **Bassem Shraydeh** — An-Najah National University, Nablus, Palestine
- **Mohammed Sulieman** — An-Najah National University, Nablus, Palestine
- **Mustafa Khamees** — Al-Quds University, Abu Dees, Palestine
- **Talal Shahwan** — Birzeit University, Birzeit, Palestine
- **Mohammed Al-Sbooa** — An-Najah National University, Nablus, Palestine
- **Hijazi Abu Ali** — Birzeit University, Birzeit, Palestine
- **Samar Shakhshir** — An-Najah National University, Nablus, Palestine

Sponsors

JAWWAL is the first Palestinian Provider for communication services; it helps all people to communicate through the latest technology regardless of the hard political, economical and social obstacles facing it. With our committed team, we had been able to overcome all the various challenges**.**

AL ZAHRA FACTORY COMPANY Is a leading manufacturer in food industry, concentrated drinks and cosmetics. It has been established since 1965 . The company is located in Nablus in Palestine .

The company produces more than fifty products distributed as follows:
neroli water, rose water, apple vinegar, white vinegar, garlic vinegar, lemon juice, starch, acetic acid, sodium bicarbonate, Concentrated fruit drinks, cream caramel, jelly, whip topping, cake flour, ground sugar, vanilla, baking powder, corn flour, ground rice, castured powder, instant sahlap, coffee whitener, choco, cocoa, cappuccino, Food Colors, Food flavoring, Natural oils and medicinal plant-extracts, Cosmetics: shampoo, hair cream, medicinal cream, perfume after shave, talc powder, hair oil, Vaseline, dishwashing liquid.

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SUN PHARM LTD It has been established since 1970. It has a long experience in pharmaceutical, food, cosmetics field Teams of 20 employees are working to answer the customer's requests.

The company is a leading company in: importing and distributing raw material used in pharmaceuticals, foodstuffs, cosmetics, detergents, paintings. Distributing of all laboratory's chemicals, equipment, glassware and kits. Distributing of all natural and medicinal herbs and oils. distributing medical and drug materials.

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Web Site :www.sunpharm-pal.com e-mail: sunpharm@sunpharm-pal.com

Sponsors

PHARMACARE PLC for the manufacturing of pharmaceuticals, chemicals, and cosmetics was incorporated as a public shareholding company in 1985. It was established by a group of Palestinian entrepreneurs, headed by the pioneer pharmacist the late Mr. Subhi Khoury, and is headquartered in Beitunia, near Ramallah. Its first product, Amoxicare, was introduced into the local market in November 1986. Ever since, Pharmacare has scored many achievements. It took the lead in exporting pharmaceuticals from Palestine; in 1993, it shipped pharmaceutical drugs to Russia and Belarus, and currently, it is ranked number 12 in the Belarusian market. In 2000, Pharmacare signed a multinational joint venture agreement with Grunenthal GmbH of Aachen, Germany, which exposed Pharmacare to the international market. In the same year, Pharmacare inaugurated its state of the art multimillion-dollar manufacturing facility rendering it c-GMP compliant. This achievement was followed by receiving the ISO 2000-9001 & ISO 14001 certificates. In 2007, Pharmacare acquired the Palestinian GMP; and in January 2008 was The Great Success, Pharmacare acquired the European c-GMP certificate, allowing it to enter the European market, thus directly contributing to the Palestinian economy; and in 2008 Pharmacare celebrated its first shipment to Germany. In October 2010, Pharmacare celebrated the official opening of Pharmacare Premium in Malta, the first Palestinian facility in EU countries. Pharmacare has distinguished itself again by establishing the Drug, Design and Discovery Laboratories in 2010, at which scientists study Palestinian herbs for their anti-cancer activity. Pharmacare is proud to have innovative research unit, and to contribute to scientific research. Pharmacare has been developing and enjoying consistent growth; with over 100 products and 200 employees, Pharmacare promises the community that it will not stop here!

Omega Raw Materials Drugstore was established in 2005 in Nablus – West Bank.

Omega is specialized in supplying most of the industries in Palestine with the necessary chemical raw materials in addition to the chemicals necessary for academic purposes.

We supply the highest quality raw materials for the industry under the best storage conditions supervised by a specialized staff in this field.

Contacts:

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2- Pharmacist: Rami Joudallah (email: rjoudallah@hotmail.com)

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Web site (under construction): www.omega.ps

Plenary Speakers

Adnan M. M. Mjalli, Ph.D.
Chairman of the Board, President and CEO

Dr. Mjalli is an internationally recognized expert in drug discovery and development of new medicines in the pharmaceutical and biotechnology industry. Dr. Mjalli is the founder, Chairman of the Board, President & CEO of TransTech Pharma, Inc., a drug discovery and development company and currently serves as Chairman of the Board of PharmaCore a drug discovery tool company, having previously been its founder, President and CEO. Dr. Mjalli obtained his Ph.D. in medicinal chemistry in 1989 from the University of Exeter, UK. His postdoctoral work was carried out at the University of Rochester. Dr. Mjalli has held various positions of increasing responsibility in research and senior management at several pharmaceutical and biotechnology companies including Merck & Co., Inc. and Ontogen Corporation. He is the author of more than 40 scientific papers, four book chapters and an inventor on more than 700 patents and patent applications. Dr. Mjalli also serves on the Board of Directors of Siga Technologies, the North Carolina Biotechnology Center, the High Point Economic Development Corporation, the High Point University, the Arab American University and the American Task Force of Palestine. Dr. Mjalli has raised more than $120M for TransTech Pharma and PharmaCore, and more than $250M in revenue for TransTech.

SELECTED AWARDS AND HONORS:

- **Triad's Most Influential People,** Triad Business Journal**, 2009**
- **Palestine Diaspora Figure Award,** Palestine International Award for Excellence & Creativity, **2008**
- **Leading Palestinian-American Award** in Business & Science**,** The American Task Force on Palestine,**2008**
- **Fast 50,** Triad Business Journal, **2008**
- **2008 Pharmaceutical Executive Emerging Pharma Leader**, Pharmaceutical Executive
- **Ernst & Young Entrepreneur Of The Year 2008 Carolinas Regional Finalists**
- **Triad's Most Influential People,** Triad Business Journal**, 2008**
- **Fast 50,** Triad Business Journal**, 2007**
- **Ernst & Young Entrepreneur Of The Year 2007 Carolinas Regional Finalists**
- **Health Care Heroes Innovator Award**, Triad Business Journal, **2007**
- **North Carolina Biotechnology Economic Development Award**, NC Biotechnology Center, **2007**
- **Triad's Most Influential People,** Triad Business Journal, **2005**
- **Fast 50**, Triad Business Journal, **2004 and 2005**
- **City of High Point Key Award,** City of High Point, NC**, 2004**
- **Honored Professional Award,** Nationwide Register's Who's Who, **2001-2002**
- **Triad's Ten To Watch** list, Triad Business Journal, **1999**
- **Science Award in Recognition and Appreciation of Excellence in Innovation and Creativity**, **1997**,Helios Pharmaceuticals
- **Glaxo Group Research Scholarship for Ph.D. degree, 1989**
- **The Lovis Rydon Memorial Research Prize**, University of Exeter (for outstanding research), **1988**
- **European Economic Community Scholarship for M.S. degree, 1985**

Plenary Speakers

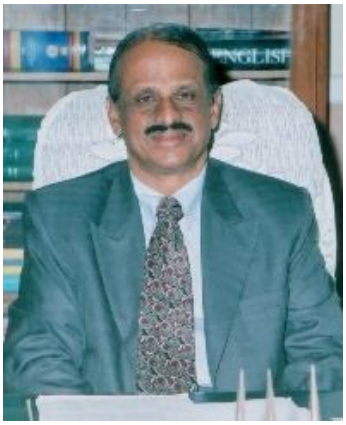
Prof. Omar Yaghi

Omar M. Yaghi was born in Amman, Jordan. He received his B.S. degree from the State University of New York at Albany and his Ph.D. from the University of Illinois-Urbana (1990) with Professor Walter G. Klemperer. He was an NSF Postdoctoral Fellow at Harvard University (1990-92) with Professor Richard H. Holm. He has been on the faculties of Arizona State University (1992-98) and University of Michigan (1999-2006). His current position is the Jean Stone Chair Professor in the Physical Sciences and Professor of Chemistry and Biochemistry at UCLA. His early accomplishments in the design and synthesis of new materials have been honored by the Solid State Chemistry Award of the American Chemical Society and Exxon Co. (1998) and the Sacconi Medal of the Italian Chemical Society (1999). His work on hydrogen storage was recognized by Popular Science Magazine which listed him among the 'Brilliant 10' scientists and engineers in USA (2006), and the US Department of Energy Hydrogen Program Award for outstanding contributions to hydrogen storage (2007). He was the sole recipient of the Materials Research Society Medal for pioneering work in the theory, design, synthesis and applications of metal-organic frameworks and the AAAS Newcomb Cleveland Prize for the best paper published in Science (2007). He is the recipient of the American Chemical Society Chemistry of Materials Award (2009). His work encompasses the synthesis, structure and properties of inorganic compounds and the design and construction of new crystalline materials. He is widely known for inventing several extensive classes of new materials termed metal-organic frameworks, zeolitic imidazolate frameworks, and covalent organic frameworks. These materials have the highest surface areas and the lowest densities known to date, making them useful in clean energy technologies such as hydrogen storage, methane storage, and carbon dioxide capture. The building block approach he developed has led to an explosive growth in the creation of new materials of a diversity and multiplicity previously unknown in chemistry. He termed this emerging field 'Reticular Chemistry' and defines it as 'stitching molecular building blocks into extended structures by strong bonds'. He published over 130 papers which have received over 200 citations per paper. He is listed among the top ten most highly cited chemists worldwide.

Plenary Speakers

Mark H. Rümmeli

Born in Malawi, Africa and raised in South America Dr. Mark Rümmeli received his undergraduate and graduate education at the University of North London and holds a first-class honours degree in 'Physics and Computing Electronics' and a Ph.D. in 'Plasma Physics and Analytical Atomic Spectroscopy'.
Dr. Rümmeli is the leader of the Molecular Nanostructures Group of The Leibniz Institute for Solid State and Materials Research, located in Dresden, Germany. His research interests include (i) the synthesis of one-dimensional nanomaterials and nanostructures such as CNT, SiC, BN nanotubes, nanorods, nanowires; (ii) the characterization of the properties of these materials using spectroscopic techniques such as EELS, TEM, SEM, AFM,XPS, Raman, etc. and, (iii) R&D on the applicability of these materials to future technology. He has published in excess of 150 journal papers.
Mark also has a passion for multimedia based learning and hybrid educational systems that blend traditional teaching platforms with contemporary digital media and has been an active and successful educational multimedia and learning systems consultant to various Caribbean institutions of higher learning. Some of his personal interests include hiking, sailing, snorkeling, skiing, photography, and chess.



J. SHASHIDHARA PRASAD

Professor Shashidhara Prasad J. obtained his doctoral degree in 1972 from University of Mysore. He started his career as a lecturer in 1971, and elevated as full Professor in 1984. He held the position of Vice-chancellor of University of Mysore, the sixth oldest in the country, between 2003-2007. He worked as a 'Commonwealth Academic Staff Fellow' in Oxford University during 1976-77. Professor Prasad is a member/Fellow of reputed International Scientific bodies and is a long standing fellow of the Institute of Physics, London. He started his research career in the area of liquid crystals. He initiated research in Interdisciplinary areas of physics, chemistry, biochemistry, molecular biology material science as the Principal Program coordinator of the National facility created by Government of India. He was the chairman of the committee on Science and mathematics under the National Knowledge Commission of Government of India to prepare new initiatives for promotion of science and the recommendations have been implemented by Government of India. He has served/serving on several committees, board of appointments, board of studies, National bodies of importance. He has been on the board of referees of several journals. He has published 335 papers in reputed journals and also presented 95 papers in conferences

Plenary Speakers

Prof. Hikmat S. Hilal, Ph.D.

Graduation: University of Manchester 1980.
Research Interests: Catalysis, semiconductors, renewable energy, nano-film technologies.
Collaboration:

- ✓ ICMCB, University of Bordeaux, France
- ✓ NREL, USA
- ✓ Algerian Universities
- ✓ Korean Universities

Publications:
Many publications in areas of materials research, solar energy, photoelectrochemistry, photocatalysis
Books: two books
Chapters: 5 Chapters in international research books
Conferences: Many conferences. Mostly invited speaker and scientific committee member

Plenary Lectures

Wednesday 01/06/2011

Session I

Chair: J. Shashidhara Prasad

Co-Chair: Nizam Diab

11:30 **Evolving Catalytic Routes for Carbon Nanotube And Graphene Growth**
Mark H. Rümmeli

Session II

Chair: Mohammed Al-Sbooa

Co-Chair: Alfred Abed Rabbo

2:00 **Translating Innovative Science into Medicine for the Treatment of Global Unmet Medical Needs**
Adnan Mjalli

Thursday 02/06/2011

Session I

Chair: Adnan Mujali

Co-Chair Naim Al-Said

8:30 **Metal-Organic Frameworks and their Applications to Clean Energy**
Omar Yaghi

Session III

Chair: Mark H. Rümmeli

Co-Chair: Mahmoud Deheidel

11:30 **Renewable Energy as Only-Choice for Mankind: Solar Energy Research Activities at Najah**
Hikmat Hilal

Session IV

Chair: Dr. Hikmat Hilal

2:00 **X-ray Crystallographic – Interdisciplinary Research**
J. Shashidhara Prasad

Opening Ceremony

10:00-11:00	**Opening Ceremony at Prince Turki Bin Abdul Aziz Theatre:**

- Introduction and phrases of Holy Quran followed by Palestinian National Anthem. Welcome & overview: Dr. Suleiman Al-Khalil, Conference Organizing Committee Chairman and Dean of the Faculty of Science.
- Welcoming message: Prof. Rami Hamdalla, President of An-Najah National University and Chairman of the Conference.
- Speech of Jawwal Company Representative.
- University Corals.

Symposia

Symposium I

Wednesday Morning 01/06/2011

Session 1: Nano Technology

Chair: J. Shashidhara Prasad

Co-Chair: Nizam Diab

11:30 **Plenary Talk**

Evolving Catalytic Routes for Carbon Nanotube And Graphene Growth

Mark H. Rümmeli

12:00 **Synthesizing Carbon Nanotubes and Graphene via Carbothermal Reduction of SixOy**

Bachmatiuk A

12:15 **Investigating The Effect of Heat Pretreatment and Catalyst Mixtures on The Yield of Epitaxially Horizontally Aligned Carbon Nanotubes Grown on St-Cut Quartz**

Imad Ibrahim

12:30 **Carbon Nanotubes**

Ragini C. Patil

12:45 **Photodegradation of Water Organic Contaminates Under Solar Simulator Light**

Ahed H. Zyoud

1:00 **Lunch break**

Session 2: Medicinal Chemistry

Chair: Mohammed Al-Sbooa

Co-Chair: Alfred Abed Rabbo

2:00 **Plenary Talk**

Translating Innovative Science into Medicine for the Treatment of Global Unmet Medical Needs

Adnan Mujali

2:30 **Pharmacare, 26 Years of Success**

Dana Awwad

3:00 **Isolation and Characterization of the active Ingredient of Selected Palestinian Medicinal plants**

Suleiman Al-Khalil

3:15 **A facile synthesis of quinazolino[1,4]benzodiazepine natural alkaloids**

Naim H. Al-Said

Symposia

3:30 **Drug Optimization & Chemical Structure Modification Of Antiseizure Drug Gabapentin**
Walaa Hmedat

3:45 **الصيدلية الشعبية- دكان العطار**
د.إدريس جرادات

4:00 **Coffee Break**

Wednesday Afternoon **01/06/2011**

Session 3: Medicinal Chemistry

Chair: Dana Awwad

4:15 **Synthesis of A New Series of Heterocyclic Scaffolds for Medicinal Purposes**
R. Arafat

4:30 **Synthesis and Biological Activities of Curcumin Based Heterocyles**
Noha Mehdawi

4:45 **Synthesis and Biological Activity of N-Heteroaromatic-substituted Thiophene-2-carbohydrazides**
Mohammed A. Al-Nuri

5:00 **Antioxidant and Anticancer Activities of Six Palestinian Plants Used In Traditional Medicine**
Ahmad Ibrahim Husein

5:15 **Adsorption of Gemifloxacin Mesylate on Activated Charcoal and Kaolin**
Hattab. A

5:30 **End of day wrap up**

8:00 **Dinner and Social Evening all participants are invited**
(place: An-Najah National University New campus)

Symposia

Symposium II

Thursday Morning **02/06/2011**

Session 1: Analytical Chemistry

Chair: Adnan Mujali

Co-Chair Naim Al-Said

8:30 **Plenary Talk**

Metal-Organic Frameworks and their Applications to Clean Energy

Omar Yaghi

9:00 **A Disposable Single-Use Optical Sensor For Potassium Determination Based On Neutral Ionophore**

A.F Al-Natsheh

9:15 **Fate of Oxytetracycline & Doxycycline in Soil & Underground Water**

Lama Sameeh Awartani

9:30 **Predicting the Solubility of Pesticide Compounds in Water Using QSPR Methods**

Omar Deeb

9:45 **Surface Energies of Metals in Both Liquid and Solid States**

Fathi Aqra

10:00 **Coffee Break**

Session 2: Organic Chemistry, Synthesis

Chair: Dr. Hatim Salim

10:15 **The Association Behavior of Small Organic Compounds in Aqueous Medium Using Light Scattering Techniques: The Benzotriazoles as an Example**

Fadwa Ode

10:30 **Direct Asymmetric Catalytic Oxidation of Ketones to α-Hydroxy Ketones Using a Chiral Bimetallic Pd(II) Complex**

Othman Hamed

10:45 **Palladium(II)-Catalyzed Dicarboxymethylation of Chiral Allylic Alcohols: Chirality Transfer Affording Optically Active Diesters Containing Three Contiguous Chiral Centers**

Othman Hamed

11:00 **Synthesis, spectral study and Antibacterial activity of Chloroarsenic(III)3(2'-hydroxyphenyl)-5-(4-substituted aryl)pyrazolinates)**
Jeeven Singh

11:15 **Kinetics of Oxidation of Alcohols with Bis (Quinuclidine) Bromine (I) Bromide in the Presence of Pyridinium Trifluoroacetate**
Laila Abdulhameed A. R.

Session 3: Material Chemistry

Chair: Mark H. Rümmeli

Co-Chair: Mahmoud Deheidel

11:30 **Plenary Talk**
Renewable Energy as Only-Choice for Mankind: Solar Energy Research Activities at Najah
Hikmat Hilal

12:00 **Tribological Performance of MoS2:Ti/MoS_2: TiBN/TiBN/TiB2/Ti Composites**
Shehdeh Jodeh

12:15 **Hydrogen Storage in Nano-Sized Metallic and Bimetallic Clusters**
Mohammed Suleiman

12:30 **Understanding Complexation and Desorption of Copper Ion in Three contaminated Soil Types in Palestine Using Surfactants and Ligands**
Ahmad A. Abu-Obaid

12:45 **Monosaccharide and Glycan Analysis by Liquid Chromatography Mass Spectrometry**
Loubna Hammad

1:00 **Lunch break**

Thursday Afternoon 02/06/2011

Session 4: Analytical

Chair: Hikmat Hilal

2:00 **Plenary Talk**
X-ray Crystallographic – Interdisciplinary Research
J. Shashidhara Prasad

2:15 **Nitrate and nitrite ion removal from water using activated carbon based on solid olive wastes**
Hiba Nassar

2:30 **An optical characterization of Tris(2-aminoethyl)aminocarboxylic acid Functionalized Polyvinylbenzyl Chloride Microspheres using polymer swelling**
Hanin R. Qasim

2:45 **The Kinetic Study Of Glyphosate Leachate in Palestinian soil at Different Concentrations**
Manar Attallah

3:00 **Coffee Break**

Session 5 : Nano Technology

Chair: Hani Awad

3:15 **New Technique to Prepare Nano-Sized CdS Films for Light-to-Electricity Conversion**
Sahar Khudruj

3:30 **Electrochromic Properties of Sol-gel NiO Films Dopped with Ti**
Atheer Abu Yaqoup

3:45 **Sensitizing Zinc Oxide Photocatalyst with Natural dye for Water Disinfection under Sun Light**
Sondos Ateeq

4:00 **Sensitization of semiconducting powder catalysts in water purification: Photo-degradation of medical drugs and microorganisms**
Fedaa Salih

4:15 **Preparation and Enhancement of CdS/ZnS Thin Films for Photovoltaic Purposes**
Maysaa Atatreh

5:00 **Recommendations and Discussion**

6:00 **Tour to the old city of Nablus , Soap Factory, Turkish Bath and Jerzeam Mountain**

ABSTRACTS

Evolving Catalytic Routes for Carbon Nanotube and Graphene Growth

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Abstract

Nanomaterials are of enormous fundamental interest, both from the point of view of discovering new physical phenomena as well as for their exploitation in novel devices. It is for these reasons that new nanostructures are being synthesized, functionalized and examined with respect to their special optical and electronic properties. Carbon nanotubes have a broad spectrum of interesting properties, which are relevant for technological applications. They are used for field emission and gas storage and are discussed as basic elements for future electronic devices in nanoscience and technology. Because of their nanometric dimensions and their interesting electronic properties, single walled carbon nanotubes (SWNT), in particular, are considered attractive structures toreplace the semiconductor components essential in integrated circuits. The application of carbon nanotubes for producing transistors or saturable absorbers has been extensively studied; however for such applications isolated semiconducting tubes are needed. Conversely, isolated metallic nanotubes are desirable as nano-conductors. The direct synthesis of SWNT of a particular electronic form, and of a particular chirality is still lacking. Graphene is also a remarkable material with incredible electrical and mechanical properties which was isolated more recently. This has made graphene the “new rising star” in nano-carbon based materials due to its exciting properties at the nanoscale, e.g. high charge carrier mobility. In addition, when existing as narrow strips or ribbons (ca. 10 nm wide) a band gap opens making them excellent candidates for field effect transistors. Hence, apart from the exciting possibilities in discovering new physics from these 2D structures, they offer tantalizing opportunities for the development of high speed (and even flexible) molecular electronics.

In order to integrate graphene in to electronics it needs to be fabricated in large areas or in highly defined ways (e.g. nanoribbons), better still, in a manner suited to current complimentary metal oxide semiconductor (CMOS) technology. Graphene synthesis routes which are directly compatible with current Si technology are limited.

The more popular routes to synthesize carbon nanotubes and graphene are based on the use of catalysts and these are usually metallic catalysts. Despite the success of metal catalysts

they have certain drawbacks; they can be toxic and cause problems in clean room environments. In addition, in the case of nanotubes, they can be quite difficult to remove and in the process of removing them, the nanostructures themselves are often damaged. Over the last few years the use of ceramics, in particular oxide catalyst systems have begun to emerge for carbon nanotube synthesis. These exciting new catalyst systems suggest some contemporary concepts regarding their growth need reevaluating.

Moreover, many of the oxides used as catalysts are often implemented as supports in Supported catalytic growth of carbon nanotubes and raise the question as to whether such supports may actually participate in the growth of the carbon nanotubes? Recent studies suggest the oxides can play an active role in the catalytic decomposition of the hydrocarbon feedstock and in the formation of sp2 carbon. This latter point is particularly pertinent to graphene because it suggests the possibility of growing graphene directly on oxide surfaces. The CVD synthesis of grapheme directly on oxides dispenses the need to transfer graphene after synthesis, as is the case with metal catalysts. Early investigations have shown nano-graphene can be formed directly over oxide surfaces using simple CVD routes. Another emerging route is a catalyst “free” route in which no catalyst material is required. Some argue the carbon structures themselves fulfill the catalytic role.

Translating Innovative Science into Medicine for the Treatment of Global Unmet Medical Needs

Mjalli, A
Chairman of the Board, President and CEO
(North Carolina, USA)

Abstract

This presentation will focus on using innovative technology in medicinal chemistry, biology, coupled with genomic data to identify the various genes that are implicated in the cause of human diseases. The translation of gene sequence into a 3D protein structure and potential ligand binding pockets on each proposed 3D structure coupled with verification in biologico using innovative techniques (computational chemistry, biology, biological assays, and medicinal chemistry) will be outlined.

The utilization of this technology in validating biological targets, pathways, as well as the discovery of novel optimal drug candidates (potency, selectivity, and other physiochemical properties) will be presented. The use of this technology in the discovery of novel treatments amongst a wide range of diseases such as diabetes, obesity, Alzheimer's, depression, glaucoma, and cancer will be outlined and discussed in this presentation.

Metal-Organic Frameworks and their Applications to Clean Energy

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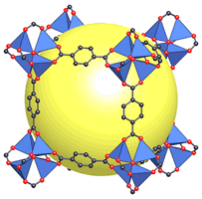
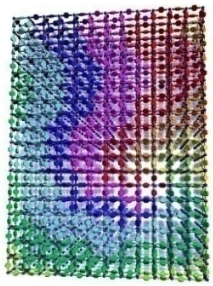
Abstract

Metal-organic frameworks (MOFs) represent an extensive class of porous crystals in which organic 'struts' are linked by metal oxide units to make an open networks. The flexibility with which their building units can be varied and their ultra-high porosity (up to 10,000 m^2/g) have led to many applications in gas storage and separations for clean energy production, to mention a few. This lecture will focus on how one can design porosity within MOFs to affect highly selective separations (carbon dioxide), storage (hydrogen and methane) and molecular recognition. The lecture will outline a new concept involving the design of a 'gene'-like sequences in MOFs that code for specific separations and chemical transformations.





References:

[1] Multiple Functional Groups of Varying Ratios in Metal-Organic Frameworks, H. Deng, C. J. Doonan, H. Furukawa, R. B. Ferreira, J. Towne, C. B. Knobler, B. Wang, O. M. Yaghi, *Science*, 2010, 327, 846-850.

[2] Colossal cages in zeolitic imidazolate frameworks as selective carbon dioxide reservoirs, B. Wang, H. Furukawa, M. O'Keeffe, O. M. Yaghi, *Nature*, 2008, *453*, 207-212.

Renewable Energy as Only-Choice for Mankind: Solar Energy Research Activities at Najah

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Abstract

Human need for energy resources is a fact of life. The demand for energy is continuously increasing with time, and is almost reaching a logarithmic relation. Unfortunately, as profitability is masterminding human current practices with energy resources, human being is doing to himself what dinosaurs did to themselves long time ago. Fossil fuels clearly cause global warming through green-house effects. Nuclear energy proves to be a dreadful alternative, as we have plenty to learn from Chernobyl and Fukushima. Bio-fuels, where energy is produced from agricultural products, are at the first glance promising prospect, give no solution. Unfortunately they are proving to be no alternative, as due to profitability interference, they came at the expense of human food.

Human being can benefit from energy without hurting future life only by following certain strict strategies. This can be achieved by wise utilization of energy sources and by investing in solar energy resources. To guarantee success, scientific thinking and reason should replace current profitability-based practices. A simple calculation, at least in theory shows that available solar energy resources are 120,000 TW. Less than 0.02% of available resources are sufficient to entirely replace fossil fuels and nuclear power which count to about 24 TW nowadays. To our estimation, if we can utilize incident solar light on one third of Algeria desert, at 10% conversion efficiency, the resulting energy is sufficient to meet current human demands. Quran revelations that Earth has enough resources for human beings are absolutely true (وقدر فيها أقواتها), if we scientists positively think of these facts. Moreover, solar energy technology needs to be seriously considered as alternative at the global level. Industrialized and developing countries need to work on such areas. Palestine should participate in such technologies for many reasons. Palestine has limited natural resources. Any future development should therefore be based on advanced technology. Such ambitious outlook dictates that Palestine heavily invests in quality teaching and researching in such areas. Materials research is one building block for solar energy technology. The philosophy is simple: we need to develop a technology which intensively demands know-how rather than

resources. *In short Palestine should develop a technology based on creativity and invention, starting with advanced materials and their applications in solar energy.* Semiconductors (SC) are a very important area of advanced materials. Almost all contemporary technologies rely on SC systems such as p-n junctions (transistors, diodes, PV, PEC, refrigeration, ….).
In this plenary, we wish to give one specific example on where Palestinian scientists can target an area of advanced material research and can contribute effectively despite limited resources. Semiconductor research activity has been established in the mid 1990s, and is now housed at SSERL. The activity started with modification of mono-crystalline n-Si and n-GaAs semiconductor surfaces for the purpose of controlling band edge positions. This was for the purpose of tailoring band edge positions to catalyze water splitting (into hydrogen and oxygen) by solar light. The objectives were successfully achieved by graduate students at ANU. To simultaneously achieve stability and efficiency of the SC electrode, other techniques were developed here. Monocrystalline n-GaAs electrodes were enhanced in stability and efficiency using polymeric coatings with electroactroactive ions inside. However, the increasing cost of monocrystalline SC materials affected our objective. Our efforts were then diverted to synthetic thin film SC electrodes. Preparation of enhanced SC materials, in the forms of thin films and nano-scale particles, has then been conducted for the purposes of solar photo-voltaics and for water purification.

SSERL researchers have been heavily engaged in preparing and enhancing SC thin films. Nano-thin CdS and CdSe films, deposited onto FTO/glass systems and are currently being used for light-to-electricity conversion processes. Modification of thin films with different techniques shows promising potential in enhancing efficiency and stability. For the first time, ANU researchers were able to stabilize CBD-based CdSe films in PEC processes.

Examples of SC research progress at ANU will be highlighted in this presentation. Some technical results and discussions will be presented. This draws inroads for young Palestinian scientists to work on advanced materials while keeping in mind their societal problems. It is also intended to attract the attention of decision makers to put materials R&D as a high priority area in the near future.

X-ray Crystallographic – Interdisciplinary Research

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Abstract

X-ray crystallography is the only technique which reveals the structure of materials at atomic level. This is very important for understanding the physical properties, activities of pharmaceutical, superionic, biological materials, biological function, and evolution. The structure helps in tailoring/modification of the materials for any application by getting insight into structure-activity correlation. A large number of crystal and molecular structure studies have been made on drug molecules, superionics, mesogens and small peptides. The power of the technique is illustrated by interesting examples which have been carried out in the national single crystal diffractometer facility.

Synthesizing Carbon Nanotubes and Graphene via Carbothermal Reduction of SixOy

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Abstract

Metal free carbon nanostructures are desirable materials for wide potential applications in composites, drug delivery, electronic circuits, especially for the silicon industry. The general requirement for the silicon industry for metal free carbon nanotubes is well known. Metals reduce chip lifetime because they react unfavourably with many materials found in circuits. Hence, the use of non-metallic catalysts is desirable for silicon compatibility (and also composites). Recently various investigations have successfully implemented oxide catalyst particles, for example, SiO_2, ZrO_2, MgO or Al_2O_3. The use of SiO_2 as a catalyst for graphitic nanostructure formation, such as carbon nanotubes and graphene, is particularly attractive for integration into Si based technology. A key question is whether carbide phases form in the reaction. We show the formation of SiC from SiO_2 nanoparticles for the synthesis of graphitic carbon nanostructures *via* chemical vapor deposition (CVD) at 900°C. Our findings point to the carbothermal reduction of SiO_2 in the CVD reaction. Moreover, the inclusion of triethyl borate accelerates the carbothermal reduction process improving the availability of SiC species and hence leads to improved yields. The formation of graphitic carbon is best explained through a carbon dissolution mechanism. The studies improve our understanding of the growth mechanisms at play in sp^2 carbon formation when using SiO_2 catalysts.

Investigating the Effect of Heat Pretreatment and Catalyst Mixtures on The Yield of Epitaxially Horizontally Aligned Carbon Nanotubes Grown on St-Cut Quartz

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Abstract

Single-walled carbon nanotubes (SWNT) are considered to be a potential material for next generation nano-electronics because of their physical and electrical properties. Their potential as key components for devices has already been proven in different applications including, field-effect transistors and logic circuits. For such applications, it's essential to synthesis SWCNT with controlled spatial position, orientation, alignment, yield and electronic type. One promising synthesis technique used for synthesizing horizontally or vertically aligned SWCNT is chemical vapor deposition (CVD). Using this method, different approaches to grow and control oriented SWNTs horizontally aligned on substrates have been explored, including low gaseous fluxes, electric fields, and selectively cut single crystal substrates such as ST-cut and AT-cut quartz. An important goal behind many of these studies is to control the density of the grown SWNT. Thermal annealing of the substrates prior the CVD process is an often implemented step to improve yield. Nevertheless, the role of the annealing step has not been fully investigated. In this study we systematically investigate the effect of the annealing step on the morphology and smoothness of the used ST-cut quartz substrates, in order to provide excellent conditions for high nucleation yields and allow for unhindered growth leading to long tubes (> 100μm). In addition, the surface morphology is shown to affect the size distribution of the catalyst nanoparticles which in turn affects their propensity to nucleate SWNT. The ratio of the metals (Fe:Co) in the catalyst mix is shown to be a less important parameter for the high yield synthesis of horizontally aligned SWNT on ST-cut quartz. The successful transfer of the grown SWCNTs onto other surfaces without incurring damage is also demonstrated.

Carbon Nanotubes

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Abstract

Since the discovery of carbon nanotubes in 1991 by Sumio Iijima, carbon nanotubes are becoming rapidly prominent in research and innovative new technologies. This paper explores the fundamentals behind the unique structure of carbon nanotubes and the concepts in synthesizing them. Furthermore, this report provides a brief overview of their properties and various applications

Photodegradation of Water Organic Contaminates Under Solar Simulator Light

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Ghazi Noor and Hikmat S. Hilal
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Abstract

Surfaces of Rutile TiO_2 particles have been modified with CdS nano-particles. The TiO_2/CdS system has been used as catalyst in water purification by photo-degrading organic contaminants such as methyl orange (a commonly encountered contaminant dye) and phenazopyridine (a medically active compound). Both UV and visible regions have been investigated. CdS sensitization of TiO_2 to visible region has been observed, as the TiO_2/CdS system showed higher catalytic efficiency than the naked TiO_2 system in the visible region. However, the TiO_2/CdS system was unstable under neutral, acidic conditions and basic conditions. Leaching out of CdS into hazardous aqueous Cd^{2+} ions occurred. This imposes limitations on future usage of CdS-sensitized TiO_2 photo-catalytic systems in water purification processes. In basic media, leaching out was less pronounced than in acidic media.

Alternative natural dye (anthocyanin) was used as a sensitizer for the rutile TiO_2 system. The TiO_2/anthocyanin catalyst was used in photo-degradation of MO and PhPY. Higher efficiency was noted when using AC/TiO_2/Anthocyanin at low pH in photo-degradation of MO.

ZnO-based catalyst systems, both naked and AC/ZnO were also examined. The ZnO systems were highly efficient in degrading contaminants, reaching complete removal in reasonable time, with AC/ZnO having a higher edge.

Effects of catalyst concentration, catalyst recovery, contaminant concentration, temperature and pH, on catalyst efficiency, have also been studied. Results and discussions will be presented.

Key words: TiO_2, ZnO, anthocyanin, photodegradation, solar light

References:

1- **Ahed Zyoud**; Nidal Zaatar; Iyad Saadeddin; Cheknane Ali; DaeHoon Park; Guy Campet; HikmatS Hilal, Ph.D , CdS-sensitized TiO2 in phenazopyridine photo-degradation: Catalyst efficiency, stability and feasibility assessment. *Journal Hazardous Materials, Elsevier*, (25 August 2009).

2- Hikmat S. Hilal*, Ghazi Y. M. Al-Nour, **Ahed Zyoud**, Muath H. Helal and Iyad Saadeddin, Pristine and supported ZnO based catalysts for phenazopyridine degradation with direct solar light, Solid State Sciences, Volume 12, April 2010, 578

3- **Ahed H. Zyoud** and Hikmat S. Hilal*, Silica-Supported CdS-Sensitized TiO2 Particles in Photo-Driven Water Purification: Assessment of Efficiency, Stability and Recovery Future Perspectives, *Chapter 5*, *Water Purification, Nova science Publ*., Pub. Date: 2009 4th Quarter.

4- Hikmat S. Hilal, Gahzi Y. M. Nour and **Ahed Zyoud**, Photo-Degradation of Methyl Orange with Direct Solar Light using ZnO and Activated Carbon-Supported ZnO, *Chapter 6*, *Water Purification, Nova science Publ*., Pub. Date: 2009 4th Quarter.

5- **Ahed H. Zyoud** and Hikmat S. Hilal, Natural dyes sensitizing TiO2 for Photo-degradation of Methyl Orange in visible light, accepted at Solid State Sciences Journal

Isolation and characterization of the Active Ingredient of Selected Palestinian Medicinal Plant

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Two medicinal plants *Rosmarinus officinalis* and *Salvia Fruticosa*_ are used in traditional medicine in Palestine for the treatment of gastrointestinal tract, also as antiseptic, antispasmodic and wound healing. In previous studies we have demonstrated the inhibitory effect of different aqueous and organic extracts of the arial parts of these shrubs. In this study we have been able to isolate the main active ingredient of *R. officinalis*, which is called Verbenone. The isolated compound was identified by means of different techniques such as UV. GC, IR, HNMR and C ^{13} NMR, with respect to
Salvia Fruticosa (triloba) grows widely on the hills of the West Bank, and has been used by the local population to relief intestinal pain · Intensive studies were conducted to determine the organic and aqueous extracts of *Salvia Fruticosa* on intestinal motility. In the current study, the aerial parts of *Salvia Fruticosa* were collected and identified and the powdered were extracted with n- Hexane , DCM and methanol.
The n- Hexane crude extract was found to be the most active with anti-inflammatory activity by inhibiting 5- lipooxygenase and cyclooxygenase enzymes.
The n- Hexane crude extract was subjected to VLC and the fractions were collected and identified by TLC, HPLC, GC- MS, HNMR and ^{13} C- NMR.

Key words: *Rosmarinus officinalis* ,*Salvia Fruticosa* (triloba), organic extracts.

A facile synthesis of quinazolino[1,4]benzodiazepine natural alkaloids

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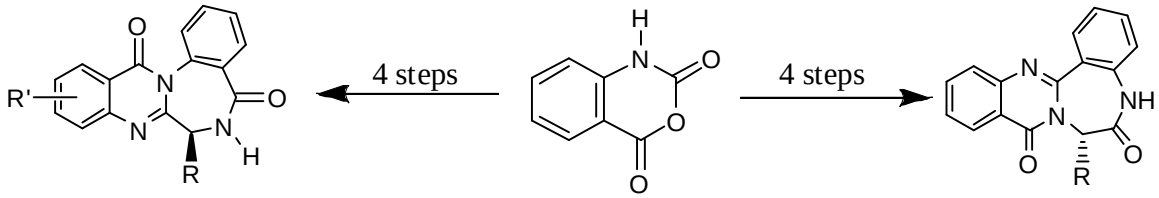
Abstract

A facile and short synthesis of a series of quinazolino[[3,2-*a*][1,4]benzodiazepine scaffold found in several biologically active naturally occurring alkaloids, including asperlicin C, circumdatin H and benzomalvin A is reported. Coupling of [1,4]benzodiazepine with 2-nitrobenzoyl chlorides, followed by a reductive *N*-heterocyclization afforded the quinazolino[[3,2-*a*][1,4]benzodiazepine ring system. Furthermore Lewis acid ($MgCl_2$, $ZnCl_2$) mediated cyclodehydration of a linear tripeptide comprised of three amino acid units provided the tricyclic quinazolino[3,2-*d*][1,4]benzodiazepine ring system found in few biologically active natural alkaloids. This methodology, implemented with a tripeptide encompassing the sequence of anthranilic-anthranilic-tryptophan methyl ester, furnish the first total synthesis of asperlicin D.



quinazolino[[3,2-*a*][1,4] benzodiazepine

quinazolino[3,2-*d*][1,4] benzodiazepine

Drug Optimization & Chemical Structure

Modification of Antiseizure

Walaa Hemedat
Department of Pharmacy
An-Najah National University

Gabapentin which is chemically known as 1-aminomethyl-1-cyclohexaneacetic acid and its structure is shown below is a very well known pharmaceutical drug useful for the treatment of epilepsy and other cerebral disorders. The medicine suffers form several disadvantages and low bioactivity. This presentation covers an overview about the drug synthesis, application and new ways of structure modification that could enhance the bioactivity of Gabapentin and reduces it side effects. The suggested chemical modification of Gabapentin is expected to increase its permeability to blood brain barrier.

الصيدلية الشعبية- دكان العطار

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الخلاصة

هدفت الدراسة إلى التعرف على آلية عمل المعالج الشعبي-العطار-والذي يقوم بمعالجة الأمراض المتنوعة بالأعشاب والمستحضرات الأخرى بالاستناد إلى أمهات الكتب القديمة والتي كان يستخدمها الآباء والأجداد في العلاج الشعبي وكذلك تجربة العطار الشخصية وتجارب الآخرين في العلاج ووصفاتهم في علاج الأمراض والعلل.

كما هدفت الدراسة إلى تعريف القراء بمحتويات دكان العطار-محل العطارة-الصيدلية الشعبية والتي تنتشر في كافة المدن الفلسطينية وخاصة في الأسواق القديمة ،ولا يزال اسم سوق العطارين موجود في الخليل والقدس وبيت لحم .

اتبعت الدراسة المنهج الوصفي باستخدام المقابلة والزيارة الميدانية لمحل العطار وكذلك الملاحظة لما يتردد على محل العطار من أشخاص وما يطلبونه منه، وفي إثناء جلوسي عند عطار لإجراء مقابلة معه وفي مدة ساعة تردد على محله عشرين شخصا،حيث كان يقطع المقابلة ويلبي طلب الرواد من المرضى والناس العاديين والذين يطلبون وصفات شعبية سواء لهم أو إلى مرضى آخرين.

سعت الدراسة إلى الإجابة عن السؤالين التاليين:

1-ما هي محتويات دكان العطار؟

2-ما هي أهم الأمراض والعلل التي يعالجها العطار؟

توصلت الدراسة إلى مجموعة من النتائج أهمها:

1-تضم دكان العطار الأعشاب والتوابل والبهارات وخلطات الأعشاب والزيوت النباتية والمستحضرات من كريمات ومساحيق يقوم بتحضيرها أو يستوردها من خارج فلسطين كالهند وباكستان.

2-يعالج العطار ويصف وصفات شعبية لمعظم العلل والأمراض ويحضر خلطات خاصة بها.

3-يعتمد العطار على تحضير الخلطات العشبية من خلال تجاربه الشخصية أو النقل عن والده.

4-العطارة وراثة في العائلة فتنتقل من الأب إلى الابن بالتقليد أو الممارسة.

5-نسبة تردد عامة الناس بغض النظر عن مستواهم العلمي على دكان العطار عالية،حيث خلال فترة ساعة وإثناء جلوسي عند العطار في الخليل لإجراء مقابلة معه تردد عشرين شخصا لطلب أعشاب ومستحضرات لعلاج الأمراض لهم أو لغيرهم.

6-يصف علاجات للأمراض الجسمية-العضوية والنفسية والعقلية.

7-تتردد عليه نسبة عالية من النساء طلبا لمساحيق علاج البشرة والتجميل التي يحضرها أو يستوردها من خارج فلسطين، وكذلك وصفات للنحافة والسمنة.

وتشير الدراسة إلى التوصيات التالية:

1- فتح مركز بحوث متخصص في تحليل الأعشاب الطبية التي يستخدمها العطار لبيان مخاطرها ودرجة الضرر منها.

2-إجراء دراسة تحليلية لمعطيات الصيدلية الشعبية-محل العطار- وحقائقه من خلال أسلوب تحليل النظم مدخلات-عمليات-مخرجات.

3-إجراء دراسات مقارنة للتجربة الفلسطينية مع تجارب العلاج الشعبي في الدول العربية والأجنبية.

4-إجراء دراسات لوضع تصورات مستقبلية لصيدلية المستقبل والتي تضم جميع المستلزمات الطبية من أدوية ووصفات شعبية.

5-إجراء دراسات متخصصة في الصيدلية الشعبية والنشر على مستوى المجلات المحكمة والمؤتمرات.

Synthesis of a New Series of Heterocyclic Scaffolds for Medicinal Purposes

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Abstract

A new series of substituted 8-fluro-4H-pyrimido[2,1-b] [1,3]benzothiazole-4-ones, substituted 7-methyl-4H-isoxazolo[2,3-a]pyrimidin-4-ones, and substituted 2-methyl-5,6,7,8-tetrahydro-9H-isoxazolo[2,3-a]pyridopyrimidin-9-ones, compounds I–VII, have been prepared for possible use in medicinal application. The preparation followed condensation of ß-keto esters with 2-aminopyridine derivatives, in the presence of polyphosphoric acid. The same technique has also been used to prepare diazepine compounds, VIII–X, by condensation of a γ-keto ester with 2-aminopyridine derivatives. Details of synthetic procedures are shown. The new compounds have been characterized by elemental analysis, GC–MS, FT-IR and NMR spectrometry. Bioactivity of these compounds has been investigated.

Keywords: Heterocyclic; medicinal,

Synthesis and Biological Activities of Curcumin Based Heterocyles

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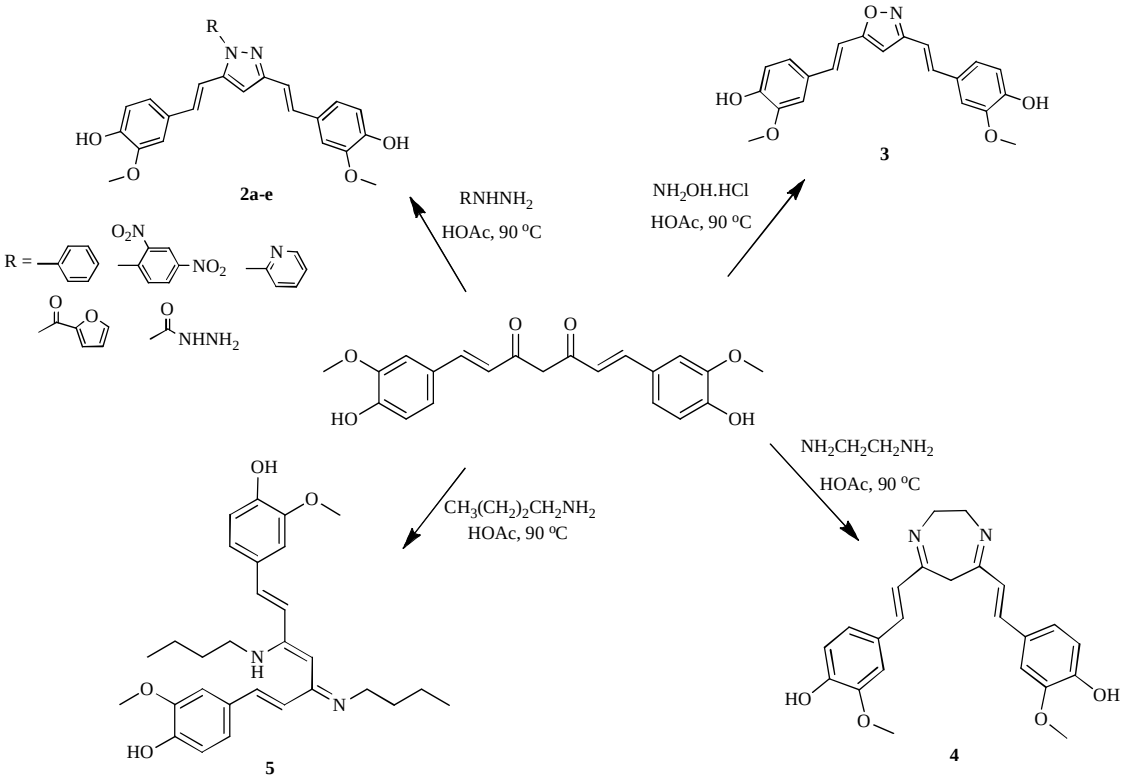
Abstract

A number of curcumin based pyrazoles, an isoxazoles, and a diazepine have been synthesized and evaluated for their antibacterial activities. The chemical structures of the newly synthesized compounds were verified on the basis of spectral data and elemental analyses. Investigation of antimicrobial activity of the compounds was done by disc diffusion method using Gram-positive (*S. aureus*) and Gram-negative (*E. coli* and *P. aeruginosa*) bacteria. All prepared compounds exhibited good antibacterial activities against Gram positive bacteria. Among all tested compounds, derivative **4** exhibited remarkable potency against Gram positive bacteria *S. aureus*.

Keywords: antimicrobial activity; pyrazoles; isoxazoles; diazepine; disc diffusion.

Curcumin Based Heterocyles Prepared From Reacting Curcumin with Various Hydrazines



Synthesis and Biological Activity of N□-Heteroaromatic-substituted Thiophene-2-carbohydrazides

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Abstract

New heteroring-substituted thiophene-2-carbohydrazides incorporating pyrrole, thiophene, and pyridine moieties have been synthesized, characterized, and screened for possible antimicrobial activity. Some of the synthesized compounds exhibited promising antibacterial activities, but rather modest antifungal activity.

Key words: Hydrazones, antimicrobial, antibacterial, antifungal.

Antioxidant and Anticancer Activities of Six Palestinian Plants Used in Traditional Medicine

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Abstract

Ethanolic extracts of six plants (*Arum palaestinum, Urtica pilulifera, Coridothymus capitatus, Majorana syriaca, Teucrium creticum, Teucrium polium*), used in traditional medicine in Palestine were tested for their antioxidant and anticancer activities. They showed different ranges of antioxidant activity due to DPPH and ß-Carotene-linoleic acid assays. The extracts were also tested for their ability to inhibit the proliferation of breast cancer cells (MCF-7) using the MTT reduction assay. The extract of *U. pilulifera* revealed the highest antioxidant due to ß-Carotene-linoleic acid assay and showed the highest cytotoxicity against breast cancer.

Key words: medicinal plants, antioxidant activity, anticancer activity, *Arum palaestinum, Urtica pilulifera, Coridothymus capitatus, Majorana syriaca, Teucrium creticum, Teucrium polium*

Adsorption of Gemifloxacin Mesylate on Activated Charcoal and Kaolin

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Abstract

In this study, the adsorption of gemifloxacin mesylate (antibiotic) using selected pharmaceutical adsorbents such as activated charcoal and kaolin was investigated spectrophotometrically in terms of initial pH, residence time, initial concentration of drug (adsorbate), weight of adsorbent and temperature. For equilibrium studies, data for adsorption of gemifloxacin mesylate (GEMX) on charcoal were shown to fit Langmuir isotherm whereas, Freundlich isotherm fitted the data very well for the adsorption on kaolin. The maximum adsorption capacity of GEMX were 137mg/g on charcoal compared to 0.04 mg/g on kaolin. This is due to high surface area of charcoal compared to kaolin. The amount adsorbed at equilibrium decreases as adsorbate's concentration increases and increases as the weight of adsorbent increases. pH played a role in the adsorption of GEMX on charcoal which was more in acidic than in basic medium. The maximum adsorption was at pH 6 and at neutral pH for kaolin. Thermodynamics parameters showed that adsorption process was exothermic and spontaneous as ΔH^o and ΔG^o had negative values. The positive value of ΔS^o showed an increase in freedom of molecules with increasing temperature. This study suggests activated charcoal as an effective antidote for cases of GEMX overdose or poisoning.
Keywords: adsorption; Gemifloxacin mesylate; Thermodynamics parameters; poisoning.

A Disposable Single-Use Optical Sensor for Potassium Determination Based on Neutral Ionophore

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Abstract

A disposable single-use optical sensor to determine potassium based on an ion-exchange mechanism is described. The test strip is formed by a circular sensing film zone 6 mm in diameter and 4.7 |im in thickness that contains all the reagents necessary to produce a selective response to potassium on a polyester sheet. The sensing zone is formed by a plasticised PVC that incorporates the cation-selective neutral ionophore dibenzo-18-crown-6, lipophilised Nile Blue, and a lipophilic salt.

At pH 9.0, the absorbance response of the test strip at 660 nm shows a good correlation with the theoretical behavior. All experimental variables that influence response, especially in terms of selectivity and response time, have been studied. The sensor responded linearly in activities in the range of 0.0125 and 76.8 mM. The detection limit is 0.0125 mM, the reproducibility intermembrane, at a medium level of the range, is 3.4%, as R.S.D. of log a_{K}+ and the intramembrane, 3.0%. The procedure was applied to the determination of potassium in different human plasma samples, pharmaceutical compounds and seawater samples, validating results against a reference procedure.

Fate of Oxytetracycline & Doxycycline in Soil & Underground Water

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Abstract

Pharmaceutical pollution is one of the most serious types of environmental pollution, that attracts increasing attention & lead research studies in recent years. Because of their great impact on aquatic life, soil & under ground water as emerging aquatic micro pollutants that have possibly been affecting the ecological system. It could have major implications on plants, wildlife and humans who may be directly & indirectly be responsible of this type of pollution. In this study two antibacterials were selected, oxytetracycline & doxycycline as examples of pharmaceuticals that are released into the environment, both are marketed in the Palestinian market either for human pharmaceutical industry or the veterinary one. In this research the adsorption behavior of both pharmaceuticals on soil, the effect of organic matter, the effect of magnesium chloride hepta hydrate addition on polluted soil, in addition their effect on characteristics of under ground water, all were studied using the UV-Vis spectrophotometry. The results showed that increasing organic matter increases the adsorption of oxytetracycline more than doxycycline, also showed that the composition of oxytetracycline complex with magnesium ion was more stable than doxycycline complex with magnesium. The study also revealed a higher concentration of doxycycline in leachate water from the soil than those of oxytetracycline, because doxycycline has higher solubility in water. It also showed a decrease of the concentrations for both substances over time in leachate water due to degradation. The degradation of both pharmaceuticals in soil & water would be produced by other substances may be harmful, as the threat of their presence in the soil and groundwater would increase the resistance of bacteria in the soil, in another words that would affect the natural properties of soil and groundwater as well.

Predicting The Solubility of Pesticide Compounds in Water Using QSPR Methods

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Abstract

Pesticide contamination of surface water and groundwater due to agricultural activities has been of concern for a long time. Water solubility indicates the tendency of a pesticide to be removed from soil by runoff or irrigation and to reach surface water. The experimental procedures determining the solubility in water of pesticides are always time-consuming, expensive and it is difficult to accurately distinguish species with similar physicochemical properties. A highly effective tool depending on a quantitative structure-property relationship (QSPR) can be utilized to predict physical properties such as bio-concentration factor and solubility in water for those pesticide compounds with no literature values. QSPR models were developed using multiple linear regression, partial least squares (PLS) and principal component neural networks analyses (PC-ANN) for 219 different pesticide compounds. The PLS and PC-ANN give good regression models with good prediction. The optimal models obtained by PC-ANN are better than those obtained by PLS analyses from the statistical point of view. The results obtained offers excellent regression models that hold good prediction ability. The descriptors used in these models are in consistence with the suggested experimental factors to affect the solubility of pesticides compounds in water.

Surface Energies of Metals in Both Liquid And Solid States

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Abstract

Although during the last years one has seen a number of systematic studies of the surface energies of metals, the aim and the scientific meaning of this research is to establish a simple and a straightforward theoretical model to calculate accurately the mechanical and the thermodynamic properties of metal surfaces due to their important application in materials processes and in the understanding of a wide range of surface phenomena. Through extensive theoretical calculations of the surface tension of most of the liquid metals, we found that the fraction of broken bonds in liquid metals (*f*) is constant which is equal to 0.287. Using the estimated *f* value, the surface tension (γ_m), surface energy (γ_{SV}), surface excess entropy ($-d\gamma/dT$), surface excess enthalpy (*Hs*), coefficient of thermal expansion (α_m and α_b), sound velocity (c_m) and its temperature coefficient ($-dc/dT$) have been calculated for more than sixty metals. The results of the calculated quantities agree well with available experimental data.

The Association Behavior of Small Organic Compounds in Aqueous Medium Using Light Scattering Techniques: The Benzotriazoles as an Example

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Abstract

The self-assembly behavior of Benzotriazoles in aqueous solutions below its solubility limit has been investigated using light scattering techniques. Various light scattering techniques were used to study the aqueous behavior of benzotriazole-1-methanol (BTAOH) and other family members. These studies have revealed the self-assembly of these molecules in water. Results show that Benzotriazoles molecules tend to aggregate in water to form nanoparticles with radius in the range of 25 nm and more. However, a range of sizes was always present in BTAOH solutions even with lower concentrations. Variable temperature DLS studies show that large particles are mainly formed due to the aggregation of smaller ones.

Direct Asymmetric Catalytic Oxidation of Ketones to α-Hydroxy Ketones Using a Chiral Bimetallic Pd(II) Complex

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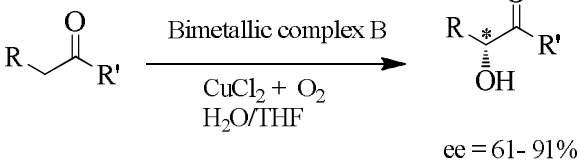
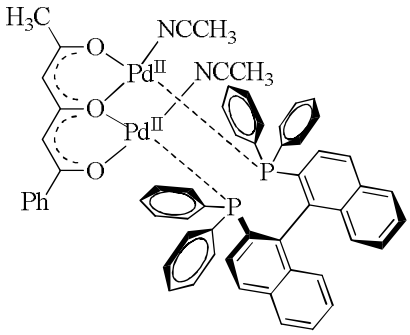
Abstract:





Chemical structure of Bimetallic complex B

Chiral bimetallic palladium (II) complex **B** was used in a catalytic air oxidation process to convert ketones directly into optically active α-hydroxyketones. The reaction was carried out in an aqueous solution of THF or dioxane, and in the presence of a catalytic amount of an acid. The enantiomeric excess (e.e.) of produced □-hydroxyl ketones ranged from 61% to 91%.

Keywords: asymmetric hydroxylation, palladium catalysis, bimetallic palladium complex, optically active, chiral α-hydroxyketone

Palladium(II)-Catalyzed Dicarboxymethylation of Chiral Allylic Alcohols: Chirality Transfer Affording Optically Active Diesters Containing Three Contiguous Chiral Centers

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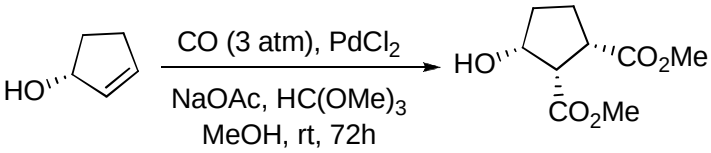
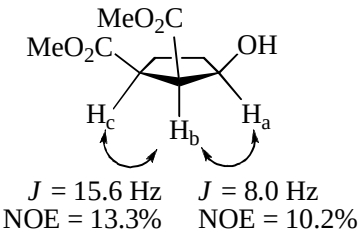
Abstract

Pd-catalyzed olefin dicarbonylation of chiral allylic alcohols with chirality transfer affords the chiral alcohol diesters contiguous chiral centers, in good to excellent diastereoselectivities (78-98%).





Synthesis, Spectral study and Antimicrobial activity of Chloroarsenic(III)3(2'-hydroxyphenyl)-5-(4-subsituted aryl)Pyrazolinates

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Abstract

Displacement reactions of arsenic trichloride with Oxygen /Nitrogen donors such as sodium salt of 3(2-hydroxyphenyl)-5-(4-X-substituted phenyl) pyrazoline in 1 : 1 and 1 : 2 molar ratio in refluxing anhydrous benzene yields $AsCl_2(C_{15}H_{12}N_2OX)$ and $AsCl(C_{15}H_{12}N_2OX)_2$ [$C_{15}H_{12}N_2OX$ =3(2'-hydroxyphenyl)-5-(4-X-subsituted phenyl) pyrazoline and X =H (1, 5), CH_3 (2,6) OCH_3, (3,7) and Cl (4,8) repectively]. Newly synthesized derivatives are yellow solids, soluble in organic solvents like benzene, chloroform, and acetone. The compounds have been characterized by elemental analyses (C, H, N,), molecular weight measurements, and spectral (IR, 1H NMR, 13C NMR) studies. The $C_{15}H_{12}N_2OX$ is bidentate to arsenic(III), leading to trigonal bipyramidal and distorted octahedral structure. The complexes were screened against different bacteria and fungi showing potential antibacterial and antifungal activities.

Key-words: Arsenic trichloride, pyrazolinates, bidentate, antimicrobial activity
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Kinetics of Oxidation of Alcohols with Bis (Quinuclidine) Bromine (I) Bromide in the Presence of Pyridinium Trifluoroacetate

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Abstract

This paper describes the kinetics and mechanism of oxidation of several monohydric alcohols to the corresponding aldehydes and ketones by bis (quinuclidine) bromine (I) bromide in the presence of pyridinium trifluoroacetate using chloroform as reaction medium. The rate constants, activation energies and related thermodynamic parameters were calculated. Deuterium kinetic isotope effects for propanol-2-d and propan(ol-d) were measured. Hammett reaction constants of m- and p- substituted benzyl alcohols were obtained. All evidences are in support of a two step mechanism and suggest that the transfer of hydride ion from the substrate to the oxidant is the rate -determining step.

Tribological Performance of MoS2:Ti/MoS_2: TiBN/TiBN/TiB2/Ti Composites.

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Abstract

Deposition of surface coatings is one of the important approaches in improving the friction and wear properties of surfaces. For instance, self-lubricating coatings such as MoS_2- Ti are advantageous in reducing friction. These self-lubricating coatings outperform liquid lubricants in several applications such as vacuum and high temperatures. Wear resistant coatings such as TiB_2 are important in reducing wear rate of a material. Even though single layer coatings have a wide range of application their tribological performance may not be sufficient. Hence, coatings that consist of different properties can be prepared as multilayer coatings. These coatings can have different sequence of layers depending on the intended application of the material. In this study, the tribological properties of a graded composite multilayer coating with specific sequence of MoS2:Ti/MoS_2:TiBN/TiBN/TiB2/Ti deposited on tool steel substrate was investigated. The coating was deposited by a Closed-Field Unbalanced Magnetron Sputtering technique. The friction and wear properties of the coating were studied at 40°C and 400°C with the help of a high-temperature reciprocating friction and wear tester and wear scars were also analyzed with Scanning Electron Microscope with incorporated Electron Dispersive Spectroscopy. The hardness of the coating was also studied with the help of micro-hardness tester. The experimental results for the tests done at 40°C have shown that the friction coefficient value ranges between 0.02 and 0.034. It has been found that the friction coefficient values were different depending on the deposition parameters used and the coatings deposited at higher substrate bias were found to result in higher friction. The durability of the coating was also found to be dependent on the deposition parameters and the specimen deposited at -150 V substrate bias and 3 % N_2 flow has the lowest durability. The friction coefficient and durability of the coatings were found to be highly dependent on temperature. At high temperature, the friction coefficient increases by three folds and the durability decreases significantly. The SEM images of the wear scars have shown that the wear is an adhesive wear type. The hardness of the tool steel surface was also improved with the deposition of the multilayer coating.

Hydrogen storage in nano-sized metallic and bimetallic clusters

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Abstract

The physical and chemical properties of low dimensional nanometer sized materials, such as nanocrystalline materials and clusters, are of particular interest because they are often size dependent and different to bulk properties [1,2]. With decreasing the size of the clusters to the nano-range the number of surface atom to volume is increased and their properties become size dependent.

Metallic clusters are used intensively in catalysis reactions such as Hydrosilylation, isomerization and hydrogenation reactions. In the case of Palladium clusters and its alloys, hydrogen can be absorbed in internal sites of the clusters [2, 4]. The palladium-hydrogen system is thus in a special way is suited for the investigation of physical properties of binary alloy systems at the smallest scale.

In this work the hydrogen solubility in different metallic clusters with discrete sizes have been investigated. Surfactant and polymer stabilized clusters, which are tension-free stabilized and have a narrow size distribution, have been prepared. Their crystallographic structure is a function of cluster size between the icosahedral and the cubic. The critical cluster size for the structural change was found to be about 4.8 nm for quasi-free stabilized Pd clusters. In this work the thermodynamic absorption behaviour of hydrogen in nano-meterd-sized metallic clusters with different sized and different structure have been determined from gravimetric and volumetric solubility isotherms. The phase transition in these samples was monitored by in situ X-ray diffraction measurements during hydrogen loading. Preliminary studies have already shown that the phase boundaries and the hydrogen uptake ability in these samples depends strongly on the lattice structure which is affected by the type of metallic clusters and the stabilizer used in samples, and that the phase diagram of Pd-H system for small cluster is strongly different from that of the solid material [3,4,5].

In this paper comprehensive picture on the effect of the size and the structure on the activity and hence on the hydrogen absorption in the low dimension system will be presented.

References

[1] H. Haberland (Ed.) Clusters of atoms and molecules, Springer-Verlag Berlin Heidelberg 1994.
[2] **M. Suleiman**, C. Borchers, M. Guerdane, N. M. Jisrawi,D. Fritsch, R. Kirchheim , A. Pundt, Z. Phys. Chem. **223** (2009) 169-181.
[3] **M. Suleiman**, J. Faupel, C. Borchers, H.-U Krebs, R. Kirchheim and A. Pundt J. Alloys Compd 404-406(2005)523
[4] **M. Suleiman**, N. M. Jisrawi, O. Dankert, M. T. Reetz, C. Bähtz, R. Kirchheim, A. Pundt, J. Alloys Compd. 356-357 (2003) 644
[5] C. Nützenadel, A. Zütel, D. Chartouni, G. Schmid, L. Schlapbach, Eur. Phys. J. D. **8** (2000) 245

Understanding Complexation and Desorption of Copper Ion in Three contaminated Soil Types in Palestine Using Surfactants and Ligands.

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Abstract

In this study we investigated the efficiency of surfactants and ligands on cleaning artificially contaminated red, sandy and white chalk soil samples from copper ion.
Before contamination, soils were characterized to determine particle size, pH, organic matter content and heavy metal contents.
Surfactants are efficient soil remediation agents for heavy metals. Various concentrations of four different surfactants Triton; X-100, SDS, Tergitol and Tween 80 were used as washing solution for remediation of contaminated soils. Triton X-100 (0.1 M) was the best surfactant to desorb copper from red soil. Tween 80 was the best surfactant to desorb copper from sandy and white chalk soils.
Recently, ligands were enhancing surfactants to desorb heavy metals from contaminated soils. Surfactants in combination with ligands were tested as washing agents for contaminated soils. Different concentrations of three different ligands (I- ,SCN- and EDTA) along with nonionic surfactant, Triton X-100 were applied as soil washing agents to desorb copper from artificially contaminated soils. Triton X-100 with 0.1 M EDTA showed a higher capacity to desorb copper than did with 0.4 M SCN- or 0.4 M I-.
The increase of ligand concentration was a critical factor for increasing leaching capacity. Without the presence of a ligand, the surfactant alone was not able to desorb copper effectively from soil.

Keywords: Adsorption, ligands, copper, leachate, isotherm.

Monosaccharide and Glycan Analysis by Liquid Chromatography Mass Spectrometry

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Bloomington, Indiana, USA

Glycosylation is a common posttranslational modification of proteins. Many important biological functions have been attributed to glycosylation, including cell-cell interactions, cell adhesion, and pathogen-host interactions. Mass spectrometry is considered the most common analytical approach employed to characterize the enzymatically released N-glycans. However, this enzymatic release is time consuming. Faster methods employing PNGase enzyme-reactor for the rapid release of N-glycans have been reported. However, none of these methods were efficient for the simultaneous detection of both neutral and acidic glycans. Here, an approach for the rapid release of N-glycans, employing a monolithic PNGase F reactor, and the online LC-MS/MS detection is described. The approach allows the simultaneous profiling of neutral and acidic N-glycans as well as the determination of glycosylation sites.

Monolithic enzyme reactor (MER) with immobilized PNGase was developed. For profiling experiments, glycoproteins were injected onto the MER. A C-8 trap was employed to capture the proteins while a porous graphitized carbon (PGC) trap was employed to capture the glycans. Glycans were transferred to the PGC column (10.0x0.075 mm) and detected by LTQ-Orbitrap. For determining the sites of glycosylation, a tryptic digest was injected into the MER. The peptides were captured on a C-18 trap while the glycans were washed-out. The peptides were resolved on C-18 column and detected on LTQ-Orbitrap. The tryptic digest was re-injected into the system bypassing the MER. By comparing the MS spectrums of the two run the sites of glycosylation was determined.

First, the chromatographic conditions for optimum the separation and the PGC LC-MS/MS detection were investigated. A binary gradient was used to perform the separation. For optimum retention, component A of the mobile phase was 7.5 mM

Ammonium acetate; pH 8.4 while component B was acetonitrile. A linear gradient from 3% B to 35.0 %B in 35 minutes was applied and the ions were detected in the positive ion-mode. N-glycans were eluted from the column in less than 30 minutes. It was found that high pH is required to elute the highly sialylated N-glycans from PGC. Other mobile phase systems were employed and the effect of pH and the ionic strength of the mobile phase on the N-glycans retention will be shown. For example, if a low pH mobile phase is used in Component A of the mobile phase, a high ionic strength is required to elute the highly sialylated structures. The different parameters allowing efficient and rapid release using the enzyme reactor were optimized using glycoproteins standard. These parameters include: the reaction time, reaction temperature and the release buffer pH and ionic strength. Results indicate that the optimum loading flow rate falls between 2 µL/min to 5 µL/min. The enzyme reactor performance at room temperature was shown to be comparable to that at 37oC with no significant decrease in performance. Ammonium Bicarbonate can be used as loading mobile phase at different concentrations (i.e. 10 mM, 20 mM and 25 mM) without the need for pH control. Neutral and acidic N-glycans released as well as the location of the glycosylation site from 10 ng fetuin were detected using the above-described approaches.

Nitrate and nitrite ion removal from water using activated carbon based on solid olive wastes

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Nitrate & nitrite contamination of surface and ground water has become one of the most serious environmental problems all over the world. Therefore simple and economic processes to purify water from those contaminants based on agricultural wastes are proposed.
Carbon has been prepared here based on solid olive stones, using different routes. Different carbon batches were then activated by different techniques. $ZnCl_2$, H_3PO_4 and $NaHCO_3$ were all used for activation under different treatment conditions. The resulting activated carbon surface was characterized by SEM and surface area measurement. Carbon activated by $ZnCl_2$ effectively adsorbed nitrate and nitrite ions from pre-contaminated water samples. Different methods of preparation and activation showed significant effects on the activated carbon adsorption efficiencies, which paralleled their porosities, surface textures and surface areas. Effect of different parameters on adsorptions processes such pH, concentration and others will be presented.

Key Words: Activated carbon, nitrate, nitrite, adsorption.

An optical characterization of Tris(2-aminoethyl)aminocarboxylic acid Functionalized Polyvinylbenzyl Chloride Microspheres using polymer swelling

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[a]Department of Chemistry and Chemical Technology, Al-Quds University, Jerusalem, PA
[b]Department of Chemistry, An-Najah University, Nablus, PA

Abstract

In this work, Tris(2-aminoethyl)aminocaboxylate functional group was attached chemically to the backbone of polyvinylbenzyl chloride which was lightly cross-linked with divinyl benzene.This ligand has a chemical structure similar to that of ethylenediamine tetraacetic acid (EDTA), as a common chelating agent for metal ions. These derivatized polymer microspheres were embedded in a hydrogel matrix of poly vinyl alcohol cross-linked with glutaraldehyde, which is optically characterized. The response is based on the interaction between the metal cations with the negative charges of the deprotonated carboxylate functional group, which led to neutralization of the charges and thus to polymer shrinking. As a result, an increase in the turbidity of the sensing membrane due to a change in the refractive index between the hydrogel and the derivatized polymer microspheres occurred. The changes in the turbidity of the sensing membrane were measured as absorbance using a conventional spectrophotometer. This sensing membrane responded selectively to Cu^{2+} solutions of different concentrations range ($1x10^{6-}$M to $1x10^{4-}$ M). It is found that Cu^{2+} bind to the demonstrated functionalized-polymer with formation constant of 1×10^5 M^{-1}.

References:

1. Shakhasher, Z.; Odeh, I.; Rajabi, I.; Khatib, M. “Optical sensing properties of dithiocarbamate functionalized microspheres, using a polyvinylpyridine-polyvinylbenzyl chloride copolymer”. Sensors, 2010, 10, 8953-8962.
2. Odeh, I.; Siam, S.; Khatib, M.; Shakhasher, Z.”An optical chemical sensor based on polymer swelling and shrinking using dithiocarbamate-polymer microspheres”. Jordan J. Chem. 2009, 4, 55-64.
3. Shakhasher, Z., Odeh, I., Jabr, S., Seitz, W.R. “An optical chemical sensor based on swellable dicarboxylate functionalized polymer microspheres for pH copper and calcium determination”. Microchimica. Acta, 2004, 144, 147- 153.

The Kinetic Study of Glyphosate Leachate in Palestinian soil at Different Concentrations.

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In Palestine many factors affect the soil, surface and ground water.
The extensive use of pesticides, fertilizers in agriculture, as well as disposal of wastewater from Israeli settlements in the West Bank, are also cited as contaminating the soil and further reducing the water resources available for Palestinians.
Hazards chemicals including their intermediate metabolites may reach ground water and contaminate it. In recent years, pesticides were used heavily in Palestine, which led to the contamination of soil and water and causing much disease. Many studies focused on the impact of pollutants such as pesticides and oil on soil and how does it affect on humans, animals, plants and the environment in general.
There are many factors affecting leachates of glyphosate to ground water as properties of the pesticide; chemical content, persistence, adsorption, solubility, volatility, and properties of glyphosate. Properties of the soil; permeability, Soil Texture, soil structure, organic matter, soil moisture and site conditions including rainfall and depth to ground water and sinkholes and bedrock were studied.
In this study, the effect of glyphosate and its movement and distribution
in soil columns were studied. The results of physical and chemical properties of soil were studied. The kinetic studies showed that the adsorption of glyphosate was first order and followed the Freundlich isotherm pattern.

A New Technique to Prepare Nano-Sized CdS Films for Light-to-Electricity Conversion

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Abstract

In this study, we intend to introduce a new technique to prepare nano-sized films of CdS for the purpose of light-to-electricity conversion processes. In order to evaluate the new systems, their photo electrochemical (PEC) characteristics have been compared with conventional counterparts, in addition, their optical and structural characteristics such as SEM and XRD have been studied and compared with conventional counterparts.

The nano-sized films were prepared by different techniques, namely: electrochemical (EC), chemical bath (CB) and electrochemical followed by chemical bath (EC/CB) deposition techniques. The latter technique describes the new preparation technique for CdS nano particles. All films were deposited onto fluorine-doped tin oxide-coated glass substrates (FTO/Glass). The different types of films were compared with each other by monitoring different parameters, such as: open-circuit voltage (V_{oc}), current density (J_{sc}), photo (J-V) plots, efficiency and stability.

Poly crystalline CdS thin films, prepared by different techniques, were modified by annealing and slow cooling to enhance PEC characteristics. The effect of treatment on film characteristics has been studied by: photo (J-V) plots, efficiency, and stability.

Annealing and slow cooling showed higher conversion efficiency for each preparation technique compared with un-treated films.

SEM and XRD results for prepared CdS films were consistent with the efficiency results for each preparation technique before and after modification. Annealing and slow cooling increased the grain size of CdS nano particle and consequently, increased the efficiency.

CdS thin films prepared by EC/CB technique, before annealing, showed higher efficiency than films prepared by EC, but lower than CB systems. After annealing, the EC/CB prepared systems showed higher efficiency than either EC or CB prepared counterparts. The results show that the new preparation technique gives new thin films with higher efficiency and stability than earlier conventional prepared.

Electrochromic Properties of Sol-gel NiO Films Dopped with Ti

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Electrochromic films of NiO & $Ni_xTi_{1-x}O_{(2-x)}$ (with Ti concentrations 5, 10, 15, 20, 25 & 30%) have been prepared by the sol-gel route using dip coating technique onto fluorine-doped tin oxide-coated glass substrates (FTO/glass). Ethanolic sols from nickel acetate tetrahydrate ($Ni(CH_3COO)_2 \cdot 4H_2O$) and titanium isopropoxide precursors were used in the preparations. The nano-sized films were sintered in air between 250 and 300°C. Characteristics of different films were studied in a comparative manner. Photoluminescence spectra, electrochromic behavior, cyclic voltammetry, XRD, thickness and SEM have been investigated.
Typically, as the TiO_2 content was increased, film characteristics were enhanced. Mechanisms of coloration and morphology transformation of the layer during cycling in 0.05 M KOH electrolyte were discussed in terms of an activation and degradation period. Calculation of cathodic charge (Q_C), anodic charge (Q_a), Optical density & Coloration efficiency were made. Our results indicate that electrochromic and other characteristics of the NiO can be enhanced by addition of TiO2 at certain concentrations.

Sensitizing Zinc Oxide Photocatalyst with Natural dye for Water Disinfection under Sun Light

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Abstract

Several procedures are commonly used for water disinfection from bacteria. Examples are chlorination, peroxide addition, ozonation and UV irradiation. Photodegradation of microorganisms has also been examined. TiO_2 and ZnO were examined by researchers for inactivation of Escherichia coli and some other types of bacteria using photo-degradation techniques.

ZnO is a wide band gap (3.2 ev) semiconductor, with limited photo-catalytic applications to shorter wavelengths only, and demands UV region for excitation. However, it has attracted attention as an interesting alternative to TiO_2 in dye sensitized solar cells. ZnO has the advantage of being sensitive to solar UV light.

Because only about 4% of the solar spectrum falls in the UV region, ZnO semiconductor is sensitized by dye molecules. Sensitized ZnO catalysts have been investigated for organic pollutant degradation in a safe and simple manner.

In this work, ZnO semiconductor nano-particles, combined with safe low cost sensitizer (natural dye anthocyanin) was used to disinfect water from bacteria by photodegrading it with solar simulator light. The natural dye sensitized ZnO to the visible light, as the dye has smaller band gap and absorbs in the visible region.

Illumination has been constructed by a solar simulator lamp. A pre-contaminated water sample with E-Coli bacteria was treated with the catalyst (ZnO/anthocyanin) under halogen spot lamp. A noticeable decline in bacteria concentration was observed. Contaminated samples were treated with naked ZnO, anthocyanin dye, and light source (without any additions) separately in control experiments.

Up to 90% degradation was achieved by the ZnO/anthocyanin catalyst system under solar light in 90 minutes. Effect of different parameters on reaction rate and efficiency, such as temperature, pH, concentration and others were also studied and will be presented.

Key Words: ZnO, bacteria, photo-degradation, anthocyanin.

Sensitization of semiconducting powder catalysts in water purification: Photo-degradation of medical drugs and microorganisms

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Photocatalytic degredation of organic contaminants in water and air attracts great deal of attention. TiO_2 is the most widely used semiconductor photocatalyst due to its high photo-stability, low cost, non-toxic nature, high oxidizing potential and its water insolubility under different conditions. In this work TiO_2 was prepared from $TiCl_3$ then sensitized by anthocyanin natural dye extracted from *Hibiscus (Karkade). The TiO_2/anthocyanin system was* then used as a catalyst to photo-degraded phenazopyridine and E-colli bacteria in water. Catalytic experiments were conducted in a 100 mL magnetically stirred thermostated beaker. The out-side walls of the beaker were covered with aluminum foil. Direct visible irradiation using a solar simulator halogen spot lamp (1300 Lux, 0.0001898W/cm^2) was applied vertically to the photo-catalytic mixture surface. The contaminant concentration was measured every 25 minute by polarography. TiO_2 was characterized by measuring the XRD, SEM, photoluminescence, UV-visible spectra. Different parameters were studied, such as pH, contaminant concentration, catalyst concentration and temperature. The efficiency of the catalyst increased with increasing the contaminant concentration, catalyst concentration and pH value. Photodegradtion reaction rate was temperature independent. Results and discussions will be presented together with possible mechanisms.

Preparation and Enhancement of CdS/ZnS Thin Films for Photovoltaic Purposes

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Abstract

Polycrystalline CdS/ZnS thin films were prepared by chemical bath deposition (CBD) technique on fluorine-doped tin oxide (FTO) coated glass substrates. Enhancement of deposited CdS/ZnS thin film characteristics at solid/liquid interface in photoelectrochemical (PEC) systems was investigated. Deposited CdS/Zns thin films were exposed to different treatment methods and different treatment methods and different experimental conditions. The films were heated to desired temperatures (300ºC, 400ºC) under air. Cooling of heated films to room temperature
was achieved by either slow cooling or quenching. Etching of film surface was conducted usingdilute HCI solution. The effect of such treatment on the film photoelectrochemical characteristics was measured by monitoring different parameters, such as: open-circuit voltage (Voc), short-circuit current density (Jsc), dark current density-potential (J-V) plots, photo J-V plots, conversion efficiency (η), fill factor (FF), Scanning electron microscopy (SEM), X-ray diffraction, together with electronic absorption and photoluminescence (PL) emission spectra.

The characteristics of CdS/ZnS thin films in PEC systems were enhanced by controlling different experimental conditions, controlling preheating temperatures and controlling cooling rates. The dark- and photo- current densities vs. potential plots were improved by annealing. Cell efficiency, fill factor, short-circuits current densities (Jsc) and SEM results were enhanced for the annealed CdS/ZnS films. The best annealing temperature for CdS/ZnS films was found to be 300ºC at which the photo J-V plots and cell efficiency were improved significantly. Slowly cooled electrodes from temperature 300ºC, gave better dark and photo current density vs. potential plots with higher efficiency than their quenched counterparts. SEM measurements were consistent with these findings, and showed better surfaces for

slowly cooled CdS/ZnS thin film electrodes. Maximum values of conversion efficiencies were obtained by slow cooling of preheated CdS/ZnS electrodes cooled from temperature 300ºC compared to that of electrodes cooled from 400ºC.

The effect of coating the CdS/ZnS electrodes with MnP/polysiloxane was also studied. The (Jsc) values of coated CdS/ZnS films (with certain Zn ratios) were significantly enhanced. The MnP/ploysilocane coating introduces a charge-transfer mediator species that enhances current and electrode stability.

Synthesis of nano-meter sized Core/Shell Bimetallic Clusters and their Hydrogen Uptake Capacity

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The main purposes of this work are size selective synthesis bimetallic core-shell clusters, such as Mg-Pd cluster with size range (2-10 nm), by using salt reduction-electrochemical combine technique, and investigating the effect of varying the preparation parameters, into the size and structure of the prepared bimetallic clusters, and investigating the hydrogen uptake capacity of these bimetallic nanoparticles.

In the proposed project the hydrogen solubility in different metallic clusters with discrete sizes should be investigated. Ideal candidates to be researched are surfactant stabilized clusters, which are tension-free stabilized and have a narrow size distribution. In this project the clusters will be Bimetallic (Mg/Pd) core/shell clusters.

In this work the preparation of bimetallic core/shell nano-particles will be performed by using salt reduction-electrochemically combined technique. This method is simple and cheap, other advantages of this method is that nano-particle size can be easily controlled by varying the preparation's parameters, such as Temperature, distance between the electrodes, electrolysis current, and solvents. That means (size selective method).

These bimetallic clusters are expected to have a good solubility and capacity to storage hydrogen, and a high stability too. Because both of magnesium and palladium metals have a very high ability to uptake hydrogen atoms and forming hydrated metals. Whereas magnesium is unstable metal-hydrides formation (has a high enthalpy of formation (MgH_2) thus it is stabilized with alloyed by other stable transition metals as Ni or Al, or by formation of bimetallic clusters with one metal be used to enhance the kinetics of hydrogen absorption by reducing the large activation barrier that magnesium inherently possesses that is palladium metal.

Then we will study the influence effecting on the hydrogen storage in these bimetallic clusters and how we can be able to promoting the adsorption/desorption processes with changing the size or M-M ratio into core-shell bimetallic clusters.

In this work the hydrogen uptake capacity in nano-meterd sized bimetallic clusters with different sized and different structure will be determined isothermally from volumetric solubility measurements.

Anti-Bacterial Activity Of Metallic/Metallic Oxide Nanoparticles Synthesised In Surfactant And Antibiotic Shells

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Recently, nanoparticles biological and medical applications is gaining a great interest because of their great positive influence in finding novel innovations and solving escalating medical problems like the multi drug resistance in infectious microorganisms that threaten the world of not finding a curing drug. Nanoparticles of different physical and chemical properties are of primary concern to find a compound with antibacterial activity. Moreover, the ability to synthesis nanoparticles in different shells; ranging from pure chemical to natural materials open new era of investigating the antipacterial activity and finding the magical antibacterial drug. In this study, different forms of metallic nanoparticles synthesized in different shells will be investigated for their antibacterial activities.
Size selective synthesis of ZnO nanoparticles is being prepared by electrochemical and/or reduction methods. Two forms of stabilization; with alkyl quaternary ammonium compounds surfactants and with quaternary surfactant in combination with antibiotics are in progress to investigate their antibacterial activity. Primarily, antibacterial activity presented by the minimum inhibitory concentration of the different forms of the prepared nanoparticles is being evaluated spectrophotometrically or visually. The reference materials and the individual nanoparticles possess a relative antibacterial activity. A more detailed analysis of the nanoparticles prepared with tetra-alkyl ammonium salt as stabilizing matrix and tetra-alkyl ammonium salt with amoxicillin is now in progress.

Synthesis Of Nano-Sized Metal/Metal Oxide Nano-Particles Stabilized In Surfactant And Polymer Matrix And Their Magnetic Properties

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Abstract:
In our research, we are going to synthesis different nanoparticles in a range of 3 to 20 nm selectively with very narrow size distribution, using chemical preparation methods, which can be carried out either by electrochemical technique or by salt reduction technique. The nanoparticles will be stabilized in a matrix. Two different stabilizing matrix will be used: polymer and surfactant matrix.
We will study the magnetic properties using the Magnetic susceptibility system MS2 at different temperatures.
The effect of the stabilizing matrix and the effect of reducing the size into the nano-range on the magnetic properties will be investigated.
The magnetic properties nanoparticles will depend on both the structure and the size of the nanoparticles, and will be affected by the type of the stabilizing matrix.
The narrow size distribution of the nanoparticles will enhance the magnetic properties of nanoparticles.

LC-MS Lipid Profiling of the Blood Plasma of Alzheimer's Patients from Two Communities: African American and Nigerian Populations

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Introduction

This work is part of the Indianapolis-Ibadan Dementia Project, which is a comparative epidemiological study examining risk factors for Alzheimer disease (AD) and dementia in two community dwelling elderly populations, Yoruba living in Ibadan Nigeria and African Americans living in Indianapolis. Previously, a significant relationship between cholesterol and apolipoprotein E genotype and the risk for AD in both populations had been found.
We report in this study the use of liquid chromatography mass spectrometry to profile lipids in the blood plasma of 63 subjects from the two populations. The differences in lipid profiles between AD and healthy individuals among the two populations were found using statistical analysis tools and the identities of the variant lipids were elucidated.

Method

The MicroTOF instrument (Bruker Daltonics) was coupled to a Dionex UltiMate 3000 LC system. A Hypersil silica column (Thermo Electron) (150 mm × 2.1 mm, 5 µm particle) and guard column were used for the separation of plasma lipids followed by ESI-mass spectrometric detection in both positive and negative ion modes. 5-µL of a 10 ng/µL internal standard mixture were added to 20 µL of blood plasma lipids and extracted using the Folch method.[1] Lipids were separated using normal-phase gradient conditions. Mobile-phase A was 5 % methanol in chloroform containing 5 mM ammonium acetate and mobile-phase B was 10 % H_2O in methanol containing 5 mM ammonium acetate. The column temperature was 20 ºC and the flow rate was 300 µL/min.

Preliminary Data

Depending on the lipid type and the head group present, plasma lipids were observed in positive ion mode as either $[M+H]^+$ or ammonium adducts $[M+NH_4]^+$, and in negative-ion mode as either their deprotonated species $[M-H]^-$ or as acetate adducts $[M+CH_3COO]^-$. 63 plasma lipid samples were profiled consisting of 31 samples from Indianapolis African Americans (15 incident AD and 16 disease-free samples) and 32 samples from Ibadan Nigerians (16 incident AD and 16 disease-free samples). Initially, Principal Component Analysis (PCA), which is a chemometric tool commonly employed to establish the differences among sample sets, was applied to display and rank the variance in the collected chromatograms. PCA score plots (PC1 vs. PC2) in both positive and negative ion modes showed two clearly separated clusters representing the original geographical difference between the samples. The lipid species that contributed most to the variance within the data sets were identified. Based on the mass accuracy, and retention time, these lipids were found to consist of various phosphocholines, and phosphoethanolamines lipids.

Acknowledgement

This work was primarily supported by the Indiana Metabolomics and Cytomics Initiative (METACyt), funded by a grant from Eli Lilly Endowment. Additional support was provided by National Institute on Aging grant #RO1AG009956, the Indianapolis-Ibadan Dementia Project, and Clinical and Translational Sciences Institute (CTSI) TRAC1 PDT Pilot Grant titled Lipid Proteins, APOE, and Risk for Alzheimer's Disease.

References

1. Folch, J.; Lees M.; Sloane Stanley, G. H. A simple method for the isolation and purification of total lipids from animal tissues. *J. Biol. Chem.* **1958**, *226*, 497-509.

Combining UV Absorbance and Diagnostic CID Fragment Ions to Identify and Distinguish Isobaric Chromophores on Phycobiliproteins

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Novel-Aspect

The exact chromophore in the biliproteins has not been confirmed in-vivo by any other method.

Introduction

Certain cyanobacteria change the tetrapyrrole pigments attached to phycoerythrin in response to the color of light available. These tetrapyrrole pigments consist of phycoerythrobilin (PEB) and phycourobilin (PUB) which are structural isomers PEB and PUB differ in the position of one double bond and are therefore isobaric but have different UV-absorbance spectra. Each phycobiliprotein may have several bilin pigments attached to various cysteine residues. Researchers purify microgram amounts of protein to perform HPLC-UV-VIS experiments to identify the pigments utilized by the organism. The pigments attached to phycoerythrins produced in green vs blue light in Synechococcus RS 9916 have not been determined. This work utilizes the CID fragmentation patterns of different bilipeptides in conjunction with UV-absorbance to facilitate pigment attachment site identifications.

Methods

Phycobiliproteins were obtained by ammonium sulfate fractionation of phycobilisomes. Two microgram samples were digested with trypsin at 37 ºC overnight in ammonium bicarbonate buffer. 20- µL of each sample was then injected onto the LC-UV-MS/MS system composed of a Dionex 3000 Ultimate LC interfaced to an Agilent 1200 DAD and an LTQ-Orbitrap mass spectrometer with a Michrom ESI source. The LC column was a Zorbax C18 (75 mm length, 0.3mm ID, 3.5 µm particle size) operated at 4 µL/minute flow rate. The MS was operated in an automated data-dependent mode alternating between an FTMS scan and 3 collision-induced dissociation (CID) scans in positive ion mode.

Preliminary-Data

Samples of phycobiliproteins from the cyanobacterium Synechococcus RS 9916 having multiple attachments of PEB, PUB, or a combination of both depending on the light conditions under which cells were grown, were obtained. The LC chromatograms of trypsin digested phycobiliproteins revealed that the bilin groups render the peptides to which they are attached more hydrophobic and therefore, they elute later in the LC run using reversed-phase conditions. PEB bilin has its maximum UV absorbance at 550 nm (green light) whereas PUB bilin absorbs at 490 nm (blue light). The LTQ-CID spectra of chromopeptides having PEB or PUB attachments revealed several diagnostic fragment ions. Bilin fragmentation was found to be favored over peptide fragmentation. Fragment ions corresponding to a free tetrapyrrole and peptide, to a free tripyrrole and a peptide attached to the remaining pyrrole unit, and to a dipyrrole were all found.

Combining the retention time delay of bilipeptides, their UV absorbance wavelength and CID diagnostic ions, resulted in the identification of all the sites and types of isobaric bilin attachments to phycobiliproteins produced in green or blue light from Synechococcus RS 9916.

Development and Validation of Green Method for Assessment of Clarithromycin in Pharmaceutical Formulation by Transmission Fourier Transform Infrared Spectroscopy

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Abstract

Clarithromycin is a semi-synthetic broad spectrum macrolide antibiotic widely used for the eradication of respiratory tract infections including atypical pneumonias and soft tissue infections. It is an important substitute for patients exhibiting penicillin sensitivity and allergy.

The methods reported previously for the detection of clarithromycin have mainly used lengthy sample preparation procedures involving liquid–liquid extraction or solid-phase extraction prior to chromatographic analysis and most of these methods suffer from long run times and require large sample volumes. Although these methods offer selective detection of clarithromycin but they are much more complex than the conventional ultraviolet (UV) detection. Clarithromycin has weak UV absorbance because it lacks a suitable chromophore which makes difficult to develop a specific, selective and sensitive method using spectrophotometry without complexation and derivatization. As a impact of such laboratory practice, large amounts of waste chemical are produced every day in industrial laboratories which is of great concern throughout the world since long. So it becomes necessary to develop alternative strategy which can substitute such traditional methods with clean and environmental friendly analytical means involving minimum consumption or replacement of toxic reagents with the reagents having no or less polluting effects.

A rapid, sensitive and environmental friendly analytical method for the direct determination of clarithromycin in tablet formulations through transmission Fourier Transform Infrared (FT-IR) spectroscopy has been successfully developed for routine quality control analysis. This method avoids any sample pretreatment except grinding or use of any solvent as extraction is no more required. Standards and samples were used in the form of KBr for recording FT-IR spectra. In the final step, chemometric method was used to filter out unmatched spectral features and the converted and filtered spectra were used to build a calibration model based on partial least square (PLS) using the FT-IR carbonyl region (C=O) from 2965-1662 cm^{-1}. The excellent correlation coefficient (R^2) was achieved (0.9999). This method gives maximum

recovery of 102% and is fully validated. This also fulfills the ever increasing demand of pharmaceutical industries for developing sensitive, economical, time consuming and environmental friendly analytical methods for the quantification of Active Pharmaceutical Ingredients (API) while monitoring quality of finished product with total analysis time of less than three minutes.

Key words: FT-IR spectroscopy; pharmaceutical formulation, clarithromycin

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Nutrient Constituents, Functional Attributes and in Vitro Protein Digestibility of the Seeds of Lathyrus Plant

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Abstract

Lathyrus seeds are a major component of human diets especially in regions with marginals soils and during drought-induced famine. 20 lines comprising ten of *Lathyrus sativus* (4 local and 5 improved), 5 lines of *Lathyrus cicera* and 5 lines of *Lathyrus onchrus* were analysed for proximate constituents, energy values , nutritionally valuable minerals, functional properties and *in vitro* multi-enzyme protein digestibility. .The mean values for crude protein, crude fibre, ether extract, ash, nitrogen-free extract and gross energy in *L. sativus* (local) were 24.9, 4.0, 9.8, 3.7, 51.7g/100g DM and 441.6kcal/100g respectively, while the corresponding values for the improved varieties were 22.9, 5.1, 6.7, 3.9, 55.9g/100g/DM and 417.6 kcal/100g . The corresponding proximate values for *L. cicera* were 20.4, 4.1, 3.8, 3.0, 63.3g/100gDM and 403.2kcal/100g; and *L. ochrus* were 22.9, 7.0, 6.1, 3.5, 54.8g/100gDM and 407.7kcal/100g respectively. Mg, K, Na, Ca and P were the most abundant minerals in all the species analysed. Mn was not detected in some lines of *L. sativus* (improved), *L. cicera* and *L. ochrus* while none was found in local *L. sativus* lines. Water absorption capacity (WAC) ranged from 120% in *L. sativus* (improved), *L .cicera* and *L. ochrus* to 250% in lines 527,508 and 504 of *L. sativus*. Among the improved lines, Oil absorption capacity (OAC) ranged from 138% to 294.4% in *L. sativus* and between 184% to 294.4% *L. ochrus.* Foaming capacity and Foaming stability at 30mins were similar in *L.*
cicera and *L. ochrus* while wide variations were observed in local and improved varieties of *L. sativus* as shown by the high coefficient of variation of 31.7 and 36.2% respectively. The emulsion capacity and emulsion stability of all the species showed little interspecies variabilities. The seed flours from all the species had varying protein solubilities with changes in pH. The proteins generally had multiple maxima and minima solubilities with pH changes. The mean *in vitro* multi-enzyme protein digestibility ranged from 75.0% in *L. sativus* (local) to 77.4% in *L. cicera.*

Key Words: Lathyrus species;Functional attributes;digestibility

The Erc Mechanism and the Formation of Abnormal Product in the Stevens Rearrangement

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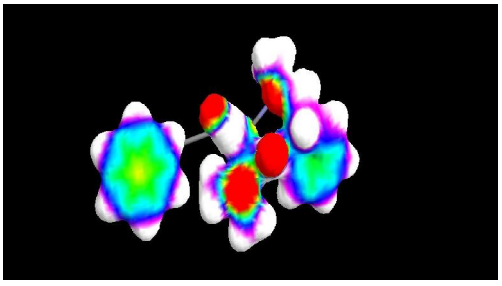
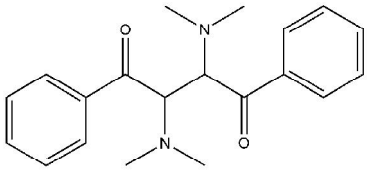
Abstract

The reaction mechanism of the Stevens Rearrangement is very much controversial one. The formation of the products in Stevens Rearrangement mainly explained by the “radical pair mechanism” and sometimes by the “ionic pair mechanism”. But the two mechanisms are still very much controversial. To explain the formation of normal and abnormal product of the Stevens Rearrangement, I proposed a new mechanism scheme entitled the ERC (Elimination Recombination Coupling) mechanism. This mechanism will explain the formation of abnormal as well as normal product and will also maintain parity between the “radical pair mechanism” and the “ionic pair mechanism”.



ESP model of Compound III (below) using ArgusLab 4.0.1



Abnormal product Compound III

Experimental and theoretical studies on efficient regeneration of carbonyl compounds from oximes under green, mild and completely heterogeneous nanocatalysis

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Abstract

New type of heterogeneous nanocatalyst for deoximation based on Tungsten oxide supported on mesoporous molecular sieve MCM-41 was developed. This new system representes inexpensive and highly active heterogeneous nanocatalyst for deoximation under green and mild reaction conditions.

Keywords: Green deoximation, Hydrogen Peroxide, Nanocatalyst, ab initio, relative stability energies, thermodynamic computation.

Synthesis of Des-Methylflunitrazepam using Hexamethelentetramine (hexamine)

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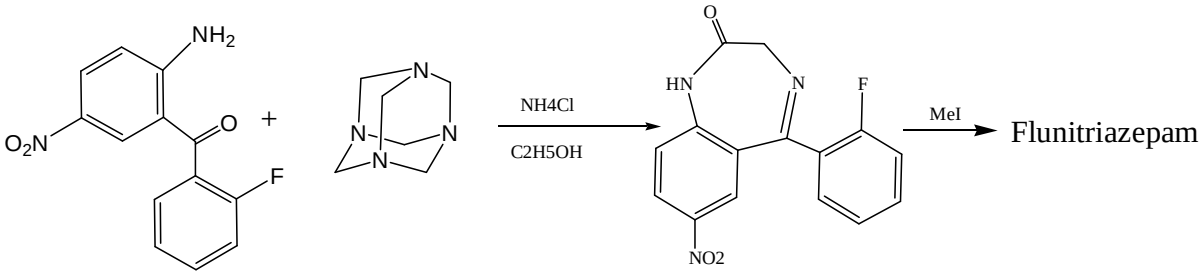
Abstract

7-nitro-1-methyl-5-(2′-fluorophenyl)-1,3-dihydro-2H-1,4-benzodiazepin-2-one (Flunitrazepam) is the drug from family of 7-membered heterocyclic compunds 1,4-benzodiazepinones. Although a number of method synthesis of flunitrazepam have been reported in literature but they suffer because using anhydrous *ammonia* or dry *ammonia gas.* [1-4].

In this research work the new methods for synthesis of flunitrazepam from 2-flouroacetamido benzophenone, hexamethylenetetramine (**hexamine) and ammonium chloride in ethanol as solvent to generate ammonia in situ,** will be reported.



The results indicate that the best result obtained when the mole ratio of the components acetamide:NH_4Cl: Hexamine : ethanol in order was as 1.0: 3.5: 2.5 :20-30

The structure of products was evaluated by melting point,^{1}H NMR, ^{13}C NMR, ^{19}F NMR,GC-Mass and IR spectroscopy techniques.

Keywords: Flunitrazepam, 1,4-benzodiazepinones**, hexamine**

References:

1. Boemches H., *Ger. Offen. 2334273,(1974*) .
2. N. Anikeev, A. I. Petrunin, M. T. Kilin, and F. V. Guss, *Pharmaceutical Chemistry Journal., Vol. 38, No. 5, 261(2004).*
3. Henryk. S., *US Patent No. 3203990 (1965).*

Phytochemical Investigation of antimicrobial Seed Extrac of *Citrus Aurantifolia (Lime)*

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Abstract

The seeds of Lime of the family Ructaceae are gaining grounds as important source for treatment in complementary medicine. The Sudanese varieties are one of the best in the market, which prompted investigation of seed extracts.

The 96% ethanolic extract exhibited significant antimicrobial activity and highlighted the biological monitoring of activity in order to isolate the active metabolites from the chloroform extract of the seeds.

The presence of sterols and triterpenes, carotenoids, coumarins, alkaloids, saponins, tannins and carbohydrates was confirmed by phytochemical screening of the diethyl ether, methanolic and aqueous extracts of the seeds. Isolation of the antibacterial secondary metabolites was achieved by fractionation of the active chloroform extract by sing, liquid solid column chromatographic technique and biological monitoring of activity of column fractions eluted with chloroform and methanol. The composition of fractions was monitored by analytical and preparative TLC from lime extracts we prepare an ointments with different concentrations.

المصنوعات الغذائية الشعبية التراثية

الواقع والتحديات

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الخلاصة:

سعت الدراسة إلى العمل على تحقيق ما يلي:

1-العمل على إحياء جانب مهم من التراث الفلسطيني وهو الصناعات الشعبية التراثية لتنميتها والمحافظة عليها.

2-العمل على تقليل حجم المعاناة التي يتعرض لها أرباب الصناعات الغذائية الشعبية في ظل اكتساح السوق بالبضائع المستوردة.

3- تقديم معلومات تخدم أصحاب القرار في اتخاذ خطوات ايجابية في رسم السياسة الإنتاجية والخطط المستقبلية بإظهار قيمة الصناعات الغذائية الشعبية ونشرها وتسويقها عالميا بما ينسجم مع الأهداف المتوخاة في خلق وإيجاد الشخصية الفلسطينية المؤمنة بأهدافها.

4-العمل على الارتقاء بالمرحلة القادمة إلى مستوى التحدي المطلوب للوصول إلى مجتمع قادر على تلبية احتياجاته بالاستفادة من مواده الأولية في تنمية وإحياء الصناعات الغذائية الشعبية.

5-إبراز البعدين التراثي والحضاري للصناعات الشعبية التي تعبر عن تاريخ وثقافة الشعب حيث تجسد الوجود الفلسطيني على أرضه.

6- الصناعات الغذائية الشعبية هي صناعات صديقة البيئة وموجهة للسياحة والمجتمع المحلي.

7-فضح وتعرية ممارسات الجانب الإسرائيلي في سرقة وانتحال وتزوير المنتجات والمقتنيات التراثية الفلسطينية.

اتبعت الدراسة المنهج الوصفي الذي يسير وفق الخطوات التالية:

1-الجانب الوصفي لواقع الصناعات الغذائية الشعبية .

2-التوصل إلى استراتيجيات وإجراءات لتفعيل إحياء وتنشيط الصناعات الغذائية الشعبية.

واستخدمت الدراسة الملاحظة المقصودة المباشرة، وذلك لتجميع الخبرات حول ما نشاهده أو نسمع عنه أو نعايشه وذلك للتعرف على واقع الصناعات الغذائية الشعبية التي كان أو ما زال يمارسها الإباء والأجداد ،والمقابلة المباشرة مع أرباب الصناعات والحرف الشعبية والمهن التقليدية، والمنهج المكتبي بالرجوع إلى الكتب والمجلات وما كتب عن الصناعات المنقرضة خاصة.

وعليه يمكن الإشارة إلى النتائج التالية:

1-الصناعات الغذائية التراثية والحرف الشعبية والتقليدية ذات بعد عائلي وأسري.

2-صناعة دبي العنب في طريقها إلى التلاشي والاضمحلال.

3-الصناعات الشعبية والحرف التقليدية صديقة للبيئة.

4-ترتبط بالبعد التراثي وتجسد الهوية الوطنية والوجود الفلسطيني.

5-تعمل على تلبية احتياجات الأسرة بطرق فنية مبتكرة.

6- موادها الأولية والمواد الخام متوفرة في البيئة المحلية.

7-معظم الإنتاج للاستهلاك المحلي .

8-تجسد الصناعات الشعبية الأفكار الفنية العملية المستوحاة من التراث الشعبي.

9-تساعد على اكتساب علاقات أسرية مترابطة متضامنة موحدة تحافظ على سر الصنعة.

10-تعطي مجالا لتنمية المهارات من تركيب وتحليل وترابط في الملمس والشكل واللون.

11-تعبر عن المجال التعبيري الذاتي الإبداعي.

12-تسمح لدخول وتطبيق الجوانب التقنية بما يتناسب مع روح ومتطلبات العصر.

13-تتطلب تراكم الخبرات وتفاعلها بطرق إبداعية.

14-تعطي فرصة للتنفيس الانفعالي وحل مشاكل التوتر والقلق وتعديل السلوك.

15-تعمل على تنمية المواهب وتفعيل الطاقة عند العامل في البحث والتفكير والتطبيق العملي.

16-تتطلب التخطيط المسبق من حيث الشكل واللون والملمس والاستعمال.

17-تعمل على تعميق وتعزيز الثقة في المجتمع باعتباره عنصر منتج وفعال.

18-تعمل على التقبل الاجتماعي للعمل ضمن الجماعة أو الأسرة أو العائلة.

19-تعمل على حل مشاكل البطالة وإشغال وقت الفراغ.

20-ارتبط بها أمثال شعبية وقصص وحكايات وأغاني وأهازيج شعبية تعبر بعفوية عن الحالة الفلسطينية.

في ضوء النتائج التي توصلت إليها الدراسة فإنها توصي بما يلي:

1-دعم وتمويل الصناعات الشعبية والحرف التقليدية ماليا من خلال تأسيس صندوق خاص لذلك تشرف عليه الوزارات المعنية كالسياحة والثقافة والتجارة والصناعة.

2-عمل ورشات عمل وتدريب لأصحاب الصناعات الحرفية التقليدية لإدخال تحسينات تكنولوجية عليها.

3-عمل ندوات وأيام دراسية لتوعية الجيل والنشء بأهمية الصناعات التراثية وتعزيز الاهتمام بها.

4-وضع خطة تسويقية للمنتجات المحلية ومنحها التسهيلات الضرورية.

5-تبني الوزارات المعنية مع القطاع الخاص إنشاء قرية حرفية سياحية أو شعبية تضم الصناعات التقليدية.

6-تنظيم وعمل معارض للصناعات الشعبية والحرف التقليدية بالتنسيق مع الدول العربية والأجنبية بشكل دوري للترويج للمنتوجات المحلية.

7-العمل على تطوير المشاريع الصغيرة بمنحها القروض والمنح المالية.

8-ختم الصناعات الشعبية بشعار خاص منعا للتزوير .

9-تنمية وتعزيز العلاقة بالمجتمع المحلي بخلق قنوات اتصال فعالة.

10-وضع خطة إعلامية للترويج للصناعات والحرف الشعبية.