



BOOK OF ABSTRACTS

Fifth Kuwait Conference of Chemistry (KCC-5)
Kuwait, March 12-14, 2018
“Chemistry for Better Future”

Organized by
Kuwait Chemical Society
www.KCC2018KW.com



**Under the Patronage of
His Highness the Amir
Sheikh Sabah Al-Ahmed Al-Jaber Al-Sabah**

Organizer



Kuwait Chemical Society

P. O. Box: 39151, Nuzhah 73052, Kuwait.

Tel: +965-22510351

Fax: +965-22525930

Conference Email: info@kcc2018kw.com

www.kcc2018kw.com

KCS Email: kuwchemical@gmail.com

Sponsors



Ministry of Social Affairs and Labor



مؤسسة البترول الكويتية
Kuwait Petroleum Corporation



مؤسسة الكويت للتقدم العلمي
Kuwait Foundation for the Advancement of Sciences

Best Oral Presentation Award Sponsor



Best Poster Presentation Award Sponsor



Agilent Technologies



AL-ARFAJ ENGINEERING Co. WLL

Book of Abstracts

Title: 5th Kuwait Conference of Chemistry 2018

Owner: Kuwait Chemical Society

Editor: Dr. Hassan Al-Rabiah

Text/Design: Mr. Mahesh Selvarajan

Legal Rights: Kuwait Chemical Society

28 February 2018

Preface



On behalf of the conference organizers, we would like welcome you to the fifth Kuwait Conference of Chemistry (KCC 2018) organized by Kuwait Chemical Society. This biannual event emphasize on the role of chemistry and chemists in the various aspects of life.

The scientific program will provide an opportunity for participants to exchange new ideas and information; thanks to the outstanding contribution from world renowned researchers and scientists in Chemistry fields for their participation. The program includes an outstanding 36 lectures and around 120 posters provided by leading scientists invited both from academia and industry as well as promising young scientists. The conference will offer the opportunity for the participants to meet and share knowledge and experience with distinguished scientists.

The title of this conference is "**Chemistry for Better Future**" and the subtopics are;

- Chemistry Teaching Competencies
- Advances in Chemistry Education
- Advances in Lab practices
- Renewable and Alternative Energy Resources
- Advances in Chemistry of Oil and Gas Industry
- Green Chemistry and Waste Management
- Advancement in Analytical Instrumentation
- Nano and Composite Materials
- Biodegradable Materials
- Advanced Medical Materials

Even though this event appears to be a regional conference, participants from all over the world were eager to attend this event. Here in Kuwait this year we have colleagues from 25 countries.

I wish all the participants of the conference a successful stay in Kuwait with plenty of new scientific contacts and unforgettable cultural impressions.

Dr. Hassan Al-Rabiah MEI MRSC
Chair, Scientific Committee, KCC 2018.
E-mail:Chair.sc@kcc2018kw.com

Contents

| | |
|---|------------|
| Committees & Correspondence..... | 3 |
| General Information..... | 5 |
| Scientific Program Schedule..... | 7 |
| Abstracts..... | 11 |
| – Opening Lecture..... | 13 |
| – Plenary Lectures..... | 15 |
| – Invited Lectures..... | 23 |
| – Oral Lectures..... | 35 |
| – Poster Presenters..... | 57 |
| Speakers C.V.'s | 179 |
| Authors..... | 217 |
| List of Presentations..... | 221 |
| Exhibitors..... | 233 |

KCC 2018 – COMMITTEES

Executive Committee

Mr. Marzouk AlShimmari (Chair) - *Kuwait Chemical Society*
Ms. Huda AlNassar (Vice-Chair)- *Public Authority for Applied Education and Training*
Dr. Hassan Al-Rabiah - *Kuwait Institute for Scientific Research*
Prof. Haider Behbehani- *Kuwait University*
Mr. Hamdan Al-Ajmi – *Petroleum Industries Company*

Scientific Committee

Dr. Hassan Al-Rabiah (Chair) - *Kuwait Institute for Scientific Research*
Prof. Haitham Lababidi - *Kuwait University*
Prof. Ali Bumajdad - *Kuwait University*
Dr. Mohan S. Rana - *Kuwait Institute for Scientific Research*
Dr. Abdirahman Yussuf - *Kuwait Institute for Scientific Research*
Prof. Fayiz Aldfeheeri - *Kuwait University*
Dr. Hassan Alshemmari - *Kuwait Institute for Scientific Research*
Dr. Bondi Gevao - *Kuwait Institute for Scientific Research*
Prof. Mohammed Afzal - *Kuwait University*
Prof. Michael V. Swain B - *Kuwait University*
Mr. Mahesh Selvarajan (Secretary) - *Alsouhub Laboratories*

Organizing Committee

Prof. Haider Behbehani (Chair) - *Kuwait University*
Mrs. Nouriya AlMutairi – *Ministry of Education*
Mrs. Nora AlHammad - *Public Authority for Applied Education and Training*
Ms. Athari Al-Rasheedi - *Ministry of Education*
Mr. Essa Alqallaf - *Ministry of Education*
Mr. Salam Hameed - *Ministry of Education*
Mr. Abdullah Al-juwaiser - *Ministry of Education*
Mr. Nabeel Eid - *Kuwait University*
Ms. Tahani AlOtaibi - *Kuwait University*
Ms. Anfal Jasim Al-Baloul-*Public Authority for Applied Education and Training*
Mr. Hemdan Al-Ajmi – *Petroleum Industries Company*

Exhibition Committee

Ms. Huda AlNassar (Chair)-*Public Authority for Applied Education and Training*
Ms. Bashayer AlMutairi – *Ministry of Education*
Mrs. Amal Shahetan Alrashedi-*Public Authority of Agriculture Affairs and Fish Resources*
Mrs. Huda Mane Alajmi– *Ministry of Education*

Publicity Committee

Mr. Hamdan Al-Ajmi (Chair) – *Petroleum Industries Company*
Mr. Tariq Al-Idriss - *Kuwait University*
Ms. Nadiya Al-Rashid - *Kuwait University*

Kuwait Conference of Chemistry - 2018



General Information

Conference Venue



The Regency Hotel

P.O. Box 1139 Salmiya: 22012.

Tel: 00965 2576 6666

Fax: 00965 2576 6999

Email: info@theregencykuwait.com

<http://www.theregencykuwait.com/contact-en.html>

Accommodation

The Regency Hotel & The Palms Beach Hotel, Kuwait

Meals

Lunch will be served every day at the conference Hotel.

Badges

Badges must be worn at all times for all the activities of the conference.



www.KCC2018KW.COM

Kuwait Conference of Chemistry - 2018



Conference Schedule

| Time | 11 March 2018 |
|---|--|
| 17:00– 20:00 | Registration - The Regency Hotel - Lobby |
| | Day 1 - 12 March 2018 |
| 10:00-11:00 | Opening Ceremony & Exhibition Inauguration Under the Patronage of His Highness the Amir Sheikh Sabah Al-Ahmed Al Sabah Representative Dr. Hamed Al-Aazmi <i>Minister of Education and Minister of Higher Education</i> |
| 11:00-11:30 | Coffee Break |
| Session 1: Opening Session Session Chair: Dr. Hassan Al-Rabiah - Kuwait Institute for Scientific Research, Kuwait | |
| 11:30-12:30 | Opening Lecture: <i>Driving Forward The Higher Education Reform : The Vital Role Of The National Bureau For Academic Accreditation And Education Quality Assurance (NBAQ)</i> Prof. Nouria Al-Awadi, <i>Inaugural General Director – NBAQ, Kuwait</i> |
| 12:30-13:30 | Prayer & Lunch Break |
| Session 2: Advances in Nano-Composite Materials Session Chairs: Prof. Ali Bumajdad - Kuwait University Prof. Abdulrahman A Alwarthan- King Saud University, KSA | |
| 13:30-14:10 | PL-1 : <i>"Advances in characterization, production and applications of diamondoid molecules".</i> Prof. G. Ali Mansoori, University of Illinois, USA |
| 14:10-14:40 | IL-1: <i>Preparation and Characterization of Novel Magnetic ZnFe₂O₄–Hydroxyapatite Core–Shell Nanocomposite and Its Use as Fixed Bed Column System for Removal of Oil Residue in Oily Wastewater Samples.</i> Prof. Dr. Mohamed Abd El-Gawad Zayed, Cairo University, Egypt |
| 14:40-15:00 | OL-1 - " <i>The effect of different beverages on the surface structures of orthodontic Nano-hybrid composites"</i> Ms. Bedoor K. Alnasser, Ministry of Education, Kuwait Dr. Abdulsalam Alhazza, Kuwait Institute for Scientific Research, Kuwait |
| 15:00-15:20 | OL-2: " <i>Titanium nanocomposites based catalysts in wastewater treatment"</i> Dr. Halema Alkandari , Public Authority for Applied Education and Training, Kuwait. |
| 15:20-15:40 | Coffee Break |
| Session 3: Advanced Material Applications Session Chairs: Prof. G. Ali Mansoori - University of Illinois, USA Dr. Abdirahman Yussuf - Kuwait Institute for Scientific Research, Kuwait | |
| 15:40-16:10 | IL-2: " <i>Highest Singlet Oxygen Generator Based on Phthalocyanines in Aqueous Media"</i> Prof. Saad Makhseed, Kuwait University |
| 16:10-16:30 | OL-3: " <i>Fabrication of Highly Efficient Non-Enzymatic Glucose Sensor Composed of NiO@SiNps Composite Materials"</i> Dr. Gowhar Ahmad Naikoo, Dhofar University, Salalah, Oman |
| 16:30-16:50 | OL-4: " <i>Determination Of Carbaryl At Modified Carbon Paste Electrode By Low Silica X Zeolite Or Polymeric Film"</i> Prof. Mama El Razi, Faculty of Sciences et Technologies, Morocco |
| 16:50-17:10 | OL-5: " <i>Green Synthesis of Iron oxide Nanoparticles using Orange peels extract and Their Application As A Tool For Drug Delivery"</i> Dr. Muhammad Zahid Qureshi, Government College University, Lahore, Pakistan. |

| Time | Day 2 - 13 March 2018 |
|--|---|
| Session 4: Advances in Chemistry Teaching Session Chairs: Prof. Fayiz Aldfeheeri – Kuwait University Dr. Haider A. J. Al Lawati - Sultan Qaboos University, Oman | |
| 9:00-9:40 | PL-2: " <i>Using Evidence-based Research to Inform Teaching: Studying Student Problem-solving using Technolgy and Eye Tracking</i> ", Prof. Norbert J. Pienta , Editor in Chief - Journal of Chemical Education, University of Georgia, USA |
| 9:40-10:10 | IL-3: " <i>Chemistry Education in the 21st Century: Meeting the Challenges</i> ", Prof. David Read , University of Southampton, UK |
| 10:10-10:40 | IL-4: " <i>Meaningful Integration of Learning Technologies in Chemistry</i> ", Prof. Baderul Khan , McWendon Education, USA |
| 10:40-11:00 | Coffee Break |
| Session 5: Chemistry Teaching Methodology Session Chairs: Prof. Norbert J. Pienta - University of Georgia, USA Prof. Abdulhadi Buolayan – Kuwait University | |
| 11:00-11:40 | PL-3: " <i>Education for Sustainable Development for Undergraduate and High-school Students: Learning Theory from Experimental</i> ", Prof. Omar El Seoud , University of Sao Paulo, Brazil |
| 11:40-12:00 | OL-6: " <i>To what extent do Science Teachers fulfil Teaching Competency from the point of view of the head of science department in middle schools In the State of Kuwait</i> " Dr. Manee AlManea , Ministry of Education, Kuwait |
| 12:00-12:20 | OL-7: " <i>الذي يمينا : حن الماضي الي المسئيل - Chemistry: From the Past to the Future</i> " (Presented in Arabic Language) Ms. Nouf Alhamdan , Kuwait University |
| 12:20-13:00 | AS-1: " <i>تطبيقات تكنولوجية الواقع المعزز في تعليم وتعلم المواد العلمية</i> " - <i>Augmented Reality Applications in Teaching and Learning Sciences</i> " - (Presented in Arabic Language). Dr Abdullah AlFalikawi , College of Education, Kuwait University. |
| 13:00-14:30 | Poster Session, Prayer & Lunch Break |
| Session 6: Educational Chemistry Lab Practices Session Chairs: Prof. David Read- University of Southampton, UK Prof. Omar El Seoud - University of Sao Paulo, Brazil | |
| 14:30-15:00 | IL-5: " <i>Lab on a Paper</i> " a Promising Approaches for Teaching Chemistry in Schools" Dr. Haider A. J. Al Lawati , Sultan Qaboos University, Oman |
| 15:00-15:20 | OL-8: " <i>Robotic Chemistry</i> " Dr. Moudi Fakhri Al-Mutairi , Umm Salamah High School, KSA. |
| 15:20-15:40 | Coffee Break |
| Session 7: Medical Material Chemistry Session Chairs: Prof. Saad Makhseed – Kuwait University Dr. Khalidah Salih Merzah - Ministry of Higher Education and Scientific Research , Iraq | |
| 15:40-16:20 | PL-4: " <i>Exciting Discoveries Utilizing Materials from the Skin of the Catfish Arius Bilineatus, Val. in the Novel Treatment of Diseases That are Unresponsive to Conventional Treatment</i> " Prof. Jassim Al-Hassan , Kuwait University |
| 16:20-16:50 | IL-6: " <i>Bionanocomposite regenerated cellulose films using ionic liquid solvent</i> " Prof. Mat Uzir Wahit , University of Technology, Malaysia |
| 16:50-17:10 | OL-9: " <i>Proteomics analysis tools to study vitamin D correlation with expression of sex-specific IGFBP-2 and IGFBP-3 in type-2 diabetes risk</i> " Dr. Majed S Alokail , King Saud University, KSA |
| 17:10-17:30 | OL-10: " <i>New modified method for determination of nitric oxide synthase activity in plasma of vitiligo patients</i> " Dr. Aymen Abdulsattar Dagher , University of Baghdad, Iraq |
| 19:00 | Dinner Banquet |

| Time | Day 3 - 14 March 2018 |
|--|---|
| Session 8: Advancements in Analytical instrumentations Session Chairs: Dr. Hassan Al-Rabiah - Kuwait Institute for Scientific Research, Kuwait Prof. Miguel A. Bañares - CSIC-Instituto de Catalisis, Madrid, Spain | |
| 9:00-9:40 | PL-5: <i>"An Innovational 5-Dimensional System (LC-GC×GC-MS/MS) for the Analysis of Petroleum Derivatives"</i> , Prof. Peter Q. Tranchida , University of Messina, Italy |
| 9:40-10:10 | IL-7: <i>"Lab-on-a-Chip Technology for Chemical & Biomedical Analyses: Fundamentals, Recent Progress, and Future Perspectives"</i> , Dr. Abdullah Dawoud Bani-Yaseen , Qatar University |
| 10:10-10:30 | OL-11: <i>"Microwave preparation of a novel Chitosan/ACTF composite for the removal of Ca+2 and Ba+2 from underground water: adsorption modeling and optimization"</i> Dr. Omnia Hassan Abdelraheem , Beni-Suef University, Egypt |
| 10:30-10:50 | Coffee Break |
| Session 9: Chemistry and Industry Session Chairs: Prof. Haitham Lababidi – Kuwait University Dr. Mohan S. Rana - Kuwait Institute for Scientific Research, Kuwait | |
| 10:50-11:30 | PL-6: <i>"Spectroscopy during catalysis: the operando methodology to understand structure-activity relationships"</i> , Prof. Dr. Miguel A. Bañares , Associate Editor - Catalysis Today, CSIC-Instituto de Catalisis, Madrid, Spain |
| 11:30-12:00 | IL-8: <i>"Plant Extract Mediated Eco-Friendly Synthesis of Pd@Graphene Nanocatalyst: An Efficient and Reusable Catalyst for the Suzuki-Miyaura Coupling"</i> Prof. Abdulrahman Alwarthan , Editor In Chief - Arabian Journal of Chemistry, King Saud University, KSA |
| 12:00-12:20 | OL-12: <i>"Effect of Different Graphite Grades on the Response Characteristics of Clomipramine Hydrochloride Sensors and its Determination in Bulk, Pharmaceutical Formulations and Biological Fluids"</i> Prof. Yousry Moustafa Ibrahim Issa , Cairo University-Faculty of Science, Egypt |
| 12:20-12:40 | OL-13: <i>"Chemical modification of waste vegetable oil for oil and gas drilling industry applications"</i> , Dr. Jothibas Ramasamy , Saudi Aramco, KSA |
| 12:40-13:00 | OL-14: <i>"Degradation Of Propham In Subcritical Water Medium: Application Of Box-Behnken Design"</i> , Prof. Ahmet Murat Gizir , Mersin University, Turkey |
| 13:00-14:00 | Prayer & Lunch Break |
| Session 10: Future Energy and Sustainability Session Chairs: Dr. Yaseer Abdul Raheem – Kuwait University Dr. Ayman Al-Qattan - Kuwait Institute for Scientific Research, Kuwait | |
| 14:00-14:30 | IL-9: <i>"Smart Material For Energy Saving Applications"</i> Dr. Afshin Hadipour , IMEC, Belgium |
| 14:30-14:50 | OL-15: <i>"Techno-Economical assessment For a Novel H₂ Production Process via Chemical Looping Technology"</i> Dr. Husain Bahzad , Public Authority for Applied Education and Training, Kuwait |
| 14:50-15:10 | OL-16: <i>"Investigation of Hydrogen Production by using Silver Coated Platinum Electrode in Phosphate Solutions"</i> , Prof. Mustafa Kemal Sangün , Mustafa Kemal University, Turkey |
| 15:10-15:40 | Coffee Break |
| Session 11: Green Chemistry Session Chairs: Dr. Hassan Alshemmari - - Kuwait Institute for Scientific Research, Kuwait Dr. Bondi Gevao - - Kuwait Institute for Scientific Research, Kuwait | |
| 15:40-16:10 | IL-10: <i>"Plastics and Microplastics in Coastal Areas of Kuwait: An Emerging Pollutant"</i> Dr. Talat Saeed , Kuwait Institute for Scientific Research, Kuwait. |
| 16:10-16:30 | OL-17: <i>"Applications of Neem Tree Products to Green Concepts"</i> Prof. Ideisan Abu-Abdoun , United Arab Emirates University, UAE |
| 16:30-16:50 | OL-18: <i>"Sludge production in chemical precipitation"</i> Ms. Maliheh Salimi , University of Stavanger, Norway |
| 16:50 | Concluding Remarks |

Kuwait Conference of Chemistry - 2018



Abstracts

**DRIVING FORWARD THE HIGHER EDUCATION REFORM :
THE VITAL ROLE OF THE NATIONAL BUREAU FOR
ACADEMIC ACCREDITATION AND EDUCATION QUALITY
ASSURANCE (NBAQ)**

Nouria Al-Awadi

*Inaugural General Director of Kuwait National Bureau for Academic Accreditation
and Education Quality Assurance (NBAQ), Kuwait*

Since the year 2002 the higher education sector in Kuwait is witnessing rapid expansion; as a consequence, sustain the quality of Kuwait's tertiary education and its continuous improvement emerged as a top national priority. The state's decisive move in this direction was the establishment of the National Bureau for Academic accreditation and Education Quality Assurance –NBAQ as Kuwait's sole national accrediting body, signifying a strategic landmark step towards overseeing the placement of Kuwait's higher education at par with global higher education systems.

In this presentation the vital role of NBAQ in driving forward the higher education reform will be elaborated.

Kuwait Conference of Chemistry - 2018



Plenary Lectures

ADVANCES IN CHARACTERIZATION, PRODUCTION AND APPLICATIONS OF DIAMONDROID MOLECULES

G.Ali Mansoori

Professor of Chemical and Bio Engineering & Physics
University of Illinois at Chicago
Room 218 Science and Engineering Offices
851 S. Morgan St. (M/C 063), Chicago, IL 60607-7052 USA
e-mail: mansoori@uic.edu

We have been studying characterization, production and applications of diamondoid molecules (a.k.a. cage-like organic hydrocarbons), that are widely used to serve as biomarkers in petroleum exploration, molecular building blocks in materials science and nanotechnology, and as drug-carriers in biomedicine [1-5]. Our investigations include search for sources of diamondoids, their enrichment and separations, their characterizations, their nanomechanics and intermolecular interactions, their molecular self-assembly and their applications in nanotechnology [1-5]. Also, we are collaborating in a multidisciplinary group to study nanomechanics and intermolecular interactions of diamondoid molecules and their derivatives.

References

1. R. C. Merkle: "Molecular building blocks and development strategies for molecular nanotechnology": <<http://www.zyvex.com/nanotech/mbb/mbb.html>>.
2. K. E. Drexler: "Building molecular machine systems". TIBTECH January 1999 (vol. 17).
3. G.A. Mansoori, "Diamondoid Molecules with Applications in Biomedicine, Materials Science, Nanotechnology & Petroleum Science. World Sci Pub Co, Hackensack, NJ, 2012.
4. G.A. Mansoori, "Diamondoids - The Molecular Lego of Biomedicine, Materials Science and Nanotechnology" J. Bioanalysis & Biomedicine, Vol. 5, Issue 2, pp.1-3, 2013.
5. A. Nazem and G.A. Mansoori. "Nanotechnology Building Blocks for Intervention with Alzheimer's Disease Pathology: Implications in Disease Modifying Strategies" J Bioanal. & Biomed., Vol.6, Issue 2, 6:009-014. doi: 10.4172/1948-593X.1000101, 2014

USING EVIDENCE-BASED RESEARCH TO INFORM TEACHING: STUDYING STUDENT PROBLEM-SOLVING USING TECHNOLOGY AND EYE TRACKING

N. J. Pienta^a

^a*Department of Chemistry, University of Georgia, Athens, Georgia, USA.*
e-mail: npienta@uga.edu

Evidence-based strategies or pedagogies for teaching and learning chemistry suggest that students learn best if they are involved and responsible for their own learning, a system described as “active learning”.¹ To that end, traditional lectures have given way to classroom activities where students work on problems or activities in small groups (even in large auditoria). Those activities and that discussion focuses on conceptual understanding and the entire process depends on students coming to “lecture” having read the material or perhaps having watched videos that might be electronic versions of the old traditional lecture.² The focus on understanding must also involve appropriate out-of-class activities (e.g., homework) and assessments.³ The evidence for the appropriate strategies of pedagogies depends on basic research. Examples of research studies directed at student problem-solving will be discussed:

(1) a browser-based tool has been used to examine the difficulty of word-problems in first semester general chemistry; the browser software generates a series of different questions that a built by an algorithm to examine a series of variables including short-term memory.^{4,5} (2) Flash web tools allowed students to draw Lewis structures or to represent the particulate nature of matter using spheres to represent different atoms.⁶ (3) Eye-tracking hardware and software has been used to examine student interpretation of proton NMR data⁷ or different visual representations of molecular structures (e.g., ball-and-stick versus lines-and-letters). Data will be presented and discussed for the three categories.

References

1. Freeman, S.; Eddy, S.L.; McDonough, M.; Smith, M.K.; Okoroafor, N.; Jordt, H.; Wenderoth, M. P. *Proc. Natl. Acad. Sci. USA*, **2014**, *111*(23), 8410-8415; doi: 10.1073/pnas.1319030111.
2. Schultz, D; Duffield, S; Rasmussen, S.C.; Wageman, J. *J. Chem. Educ.*, **2014**, *91* (9), pp 1334–1339; DOI: 10.1021/ed400868x
3. Laverty, J.T.; Underwood, S. M; Matz, R.L.; Posey, L.A.; Carmel, J.H.; Marcos D. Caballero, Cori L. Fata-Hartley, Diane Ebert-May, Sarah E. Jardeleza, Cooper, M. M. *PLoS One*, **2016**; doi.org/10.1371/journal.pone.0162333.
4. Schuttlefield, J.S.; Kirk, J.S.; Pienta, N.J.; Tang, H. *J. Chem. Ed.*, **2012**, *89* (5), 586-91. DOI: 10.1021/ed100865y
5. Tang, H.; Kirk, J.S.; Pienta, N.J. *J. Chem. Ed.*, **2014**, *91* (7), 969-975
6. Pienta, N.J. *Quím. Nova* **2017**, *40* (4), 469-475.
7. Topczewski, J.J.; Topczewski, A.M.; Kendhammer, L.; Pienta, N.J. *J. Chem. Educ.* **2017**. *94* (1), 29-37.

Acknowledgements: Some of this work was funded by the US National Science Foundation (DUE).

EDUCATION FOR SUSTAINABLE DEVELOPMENT FOR UNDERGRADUATE AND HIGH-SCHOOL STUDENTS: LEARNING THEORY FROM EXPERIMENTAL

Omar A. El Seoud,

Institute of Chemistry, the University of São Paulo, 05508-000 São Paulo, SP, Brazil
e-mail: (elseoud@usp.br)

The concept of *Education for Sustainable Development* was introduced by the UNESCO in order to “integrate the principles, values, and practices of sustainable development into all aspects of education and learning”.¹ This philosophy should start at high-school and undergraduate levels by implementing new syllabi, and introducing innovative methods that emphasize teaching through a problem-oriented approach. The latter dwells on current, socio-economically important issues, e.g., the increased use of sustainable fuels, biodegradable polymers, and green solvents. An equally important issue is the necessity of moving teaching from classic learning, i.e., information transfer into student-centered “active learning” teaching where the students work in groups to solve relevant problems, by making suggestions for possible solutions.² Using the same teaching approach and simpler problems, active learning should be extended to high-school students. On all levels, effort should be done to link the experimental to theory.

Our efforts to tackle these problems at the undergraduate and high school levels will be presented. We used active learning to present diverse topics, e.g., chemical kinetics to teach reaction mechanism; dyeing and SEM microscopy to explain the reason for consumer preference for clothes made of natural fibers (cotton). We introduced the synthesis and different methods of analysis of biofuels (bioethanol and biodiesel) and their blends with petroleum-based fuels (gasoline and diesel oil). The methods include the use of natural or synthetic dyes (Uv-vis), as well as instrumental analysis, both simple, e.g., GC and hyphenated (GC/MS). The positive answer of the students to our approach was stimulating; the contact between high school-university is both demanding and rewarding.

References

- 1- UNESCO, 2005, <http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/>.
- 2- Eilks, I.; Byers B., *Chem. Educ. Res. Pract.*, **2010**, *11*, 233-240
- 3- Silva, P. L.; Rodrigues, F.; El Seoud, O. A. *Educ. Chem.*, **2009**, *46*, 145-147.
- 4- El Seoud, O. A.; Loffredo, C.; Galgano, P. D.; Sato, B.; Reichardt, C. *J. Chem. Educ.*, **2011**, *88*, 1293-1297
- 5- Galgano, P. D. ; Loffredo, C; Sato B. M.; Reichardt, C.; El Seoud, O. A. *Educ. Res. Pract.*, **2012**, 147-153.
- 5- El Seoud, O. A.; Galgano, P. D.; Arêas, E. P. G.; Moraes, J. M. *J. Chem. Educ.*, **2015**, *92*, 752-756.
- 6- Novaki, L. P.; Costa, R. T.; El Seoud, O. A. *J. Lab. Chem. Educ.*, **2015**, *3*, 22-28.
- 7- Novaki, L. P.; Chinelatto, A. M.; El Seoud, O. A. *J. Lab. Chem. Educ.*, **2015**, *3*, 59-66.
- 8- Novaki, L. P.; Chinelatto, A. M.; d’Almeida e Silva, M. J. L.; Brotero, P. P.; El Seoud, O. A. *J. Lab. Chem. Educ.*, **2016**, *4*, 38-44.

Acknowledgements

I thank my co-workers, USP and high school students and their teachers who enthusiastically participated in these projects; FAPESP research foundation and CNPq, respectively, for financial support (grant 2014/22136-4) and research productivity award (grant 307022/2014-5).

EXCITING DISCOVERIES UTILIZING MATERIALS FROM THE SKIN OF THE CATFISH *ARIUS BILINEATUS*, VAL. IN THE NOVEL TREATMENT OF DISEASES THAT ARE UNRESPONSIVE TO CONVENTIONAL TREATMENT.

Jassim M. Al-Hassan

Biological Sciences Dept., Faculty of Science, Kuwait University.

The catfish *Arius Bilineatus*, Val., elaborates thick gel-like proteinaceous material through its epidermis when threatened or injured. This material is composed of 85% proteins and 13.4% lipids with 1.6% nucleic acid components and carbohydrates. Both the proteins and lipids are biologically active. We hypothesized that this proteinaceous material is for the protection of the catfish against injury. Our continued research activities proved that the secreted gel-like material has activities on blood, cellularity and contains enzymatic activities. Fractions and isolated compounds from catfish skin preparation (CSP) enhanced wound and diabetic ulcer healing, caused regeneration of crushed sciatic nerve in experimental animals, acted as anti-inflammatory and as anti-cancer against prostate, liver, pancreatic, lung, skin cancer cell lines and acted on leukemic cells in synergism with Gleevec. Our recent preliminary research efforts proved that a fraction from CSP has interesting action on diabetes and regeneration of organs affected by diabetes. More interesting research results are being generated in collaboration with The University of Texas MD Anderson Cancer Center in Houston, TX, and the Sick Children Hospital Research Institute, University of Toronto, Canada.

This research is supported by Kuwait Foundation for Advancement of Sciences grant # 2013120701 A-D and Kuwait University grant # SL03/14.

AN INNOVATIONAL 5-DIMENSIONAL SYSTEM (LC-GC×GC-MS/MS) FOR THE ANALYSIS OF PETROLEUM DERIVATIVES

P.O. Tranchida, M. Zoccali, L. Mondello

*Dipartimento ChiBioFarAm, Polo Annunziata, University of Messina, viale Annunziata, Messina, Italy
e-mail: ptranchida@unime.it*

Petroleum products are very complex samples characterized by many hydrocarbon families and, therefore, the complete separation of these products can be problematic because their complexity greatly exceeds the peak capacity of conventional GC.

Recently, comprehensive two-dimensional gas chromatography (GC×GC) has emerged as a popular technique due to its high resolution power and amount of information that is able to provide due to the distribution of the different compounds in a bidimensional plot. However, even if in this approach the different families are separated according to boiling points, along the first dimension, and to polarity, along the second dimension, some co-elutions still occur. A pre-separation step by means of an LC system, operated under normal phase conditions, allows the separation of single hydrocarbons families, according to their polarity, making possible their isolation and reinjection into a GC×GC system. The latter was equipped with a double oven, a programmed-temperature vaporizer (PTV) injector for large volume introduction, and was coupled with a fast-scanning triple quadrupole mass spectrometer, that allowed the identification of different compounds according to mass spectral comparison with an MS database, as well as quantification.

The 5D approach was able to provide a better separation inside each family with respect to “conventional” GC×GC; moreover, the presence of an auxiliary oven in the second dimension allowed the application of an independent temperature programme with respect to the first dimension, allowing the possibility to optimize the analytical parameters for each family. The PTV injector enabled the introduction of large sample volumes that was valuable for the determination of low-concentration compounds, such as polyaromatic hydrocarbons; in fact, the analysis of such compounds is important due to their harmful effects on the environment and human health. Additionally, the use of an LC step was very useful for sample pre-fractionation and for the reduction of matrix effects, due to an exchange of the matrix with pure solvent. A specifically-developed GC×GC software allowed easy qualitative (through MS database searching) and quantitative analysis.

Acknowledgements: The authors gratefully acknowledge Shimadzu Corporation and MerckMillipore Corporation for the continuous support

SPECTROSCOPY DURING CATALYSIS: THE *OPERANDO* METHODOLOGY TO UNDERSTAND STRUCTURE-ACTIVITY RELATIONSHIPS

M. A. Bañares

CSIC – ICP, Instituto de Catalisis y Petroleoquímica, Madrid, SPAIN

e-mail: miguel.banares@csic.es

The *operando* methodology analyzes both, the catalyst structure and its activity/selectivity simultaneously in a cell that is fit for *in situ* spectroscopy and performs like a catalytic reactor. It provides a tool to understand the actual state of the catalyst, its transformations during reaction and how these correlate with changes in catalytic performance. Some representative works illustrate this.¹⁻⁴

We will present a study on the role of additives, support, coverage, hydration and reaction conditions on the states of supported vanadium and its relevance for catalytic reaction and reducibility. This is applied to assess the molecular basis for activation/deactivation and the nature of the catalyst active site for oxide reduction, alkane oxidative dehydrogenation, ammoxidation and for environmental selective catalytic reduction of NO_x. We will illustrate how *operando* methodology engages with complementary methodologies; collaboration with complementary talents is critical, such as computational chemistry, engineering and other spectroscopies. As a matter of fact, the transversal nature of the *operando* approach places it at the junction between fundamental catalytic chemistry and applied chemical engineering.

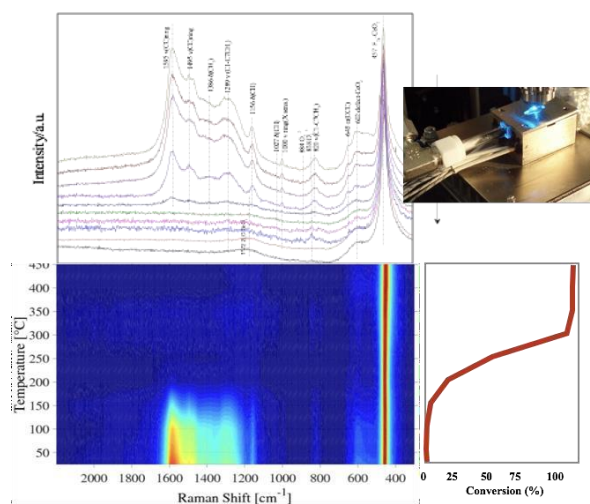


Figure 1. *Operando* Raman-online FTIR study during catalysis, catalyst structure, adsorbed species and activity are monitored simultaneously

References

1. Rasmussen, S, Portela, R, Bazin, P, Ávila, P, Bañares, MA, Daturi, M, *Appl.Catal.B* **2018**, 224, 109–115
2. Bañares, M. A., Mestl, G. *Advances in Catalysis*, **2009**, 52, 43–128
3. Martínez-Huerta, MV, Deo, G, Fierro, JLG, Bañares, M. A, *J.Phys. Chem. C*, **2008**, 112, 11441–11447
4. Guerrero-Pérez, M. O., Bañares, M. A., *J. Phys. Chem. C*, **2007**, 111, 1315–1322.

Acknowledgements: This work was funded by European project BIORIMA (Grant 760928), Spanish Ministry MINECO project CTQ2014-57578-R and Comunidad de Madrid Alcones, S2013/MAE•2985.

Kuwait Conference of Chemistry - 2018



Invited Lectures

PREPARATION AND CHARACTERIZATION OF NOVEL MAGNETIC $ZnFe_2O_4$ -HYDROXYAPATITE CORE-SHELL NANOCOMPOSITE AND ITS USE AS FIXED BED COLUMN SYSTEM FOR REMOVAL OF OIL RESIDUE IN OILY WASTEWATER SAMPLES

Mohamed Abd El-Gawad Zaved

Inorganic and Analytical Chemistry (D.Sc. Analytical Chemistry), Faculty of science, Cairo University
A.R. EGYPT; mazayed429@yahoo.com, Tel: 002-02-22728437, Fax: 002-02-35728843

Using magnetic nanoparticles to remove the dispersed oil from produced water is a promising way to overcome the difficulties faced by current treatment technologies. Therefore, in this study, novel $ZnFe_2O_4$ -hydroxyapatite core-shell nanocomposite (ZFHA) was prepared by precipitation method and used as adsorbent to remove residual oil from produced wastewater. The prepared ZFHA nanocomposite was studied by FTIR, X-ray diffraction, high resolution transmission electron microscopy (HRTEM), SAED and EDX. The results revealed that hydroxyapatite was coated on the $ZnFe_2O_4$ surface and formed a core-shell structure. The effect of various parameters on oil adsorption process like bed height (59, 118 and 178 mm), flow rate (1, 3 and 5 mL min^{-1}), effect of temperature 25-77°C and initial oil concentration (100, 500, 1000 and 10000 ppm) was investigated. The experimental data showed that with increased column bed depth from 59 to 178 mm, breakpoint time (t_b) increased from 30 to 48 min. The highest equilibrium adsorption capacity of oil at optimum conditions (77°C, 10000 ppm, 3 ml/min and 178 mm) were estimated to be 3500 mg L^{-1} . The contact time decreased with the increase of bed height and flow rate. Adsorption kinetic was evaluated in fixed bed column. Several column adsorption models (Thomas and Yoon-Nelson) were applied to predict the breakthrough curves. The results showed that the both models (Thomas and Yoon-Nelson) were fitted the experimental data well and oil can be successfully removed by ZFHA through the column test. Finally, the regeneration of the exhausted ZFHA adsorbent was assessed; which revealed satisfactory results for three times reusability after saturation. Therefore; ZFHA could be applied effectively for adsorption of residual oil from actual oily wastewater samples collected from Egyptian fields of petroleum industry.

Keywords: Magnetic $ZnFe_2O_4$ -Hydroxyapatite, Core-Shell Nanocomposite, Oil Adsorption, Oily wastewater samples, Adsorption kinetics, Thomas and Yoon-Nelson Models.

HIGHEST SINGLET OXYGEN GENERATOR BASED ON PHTHALOCYANINES IN AQUEOUS MEDIA

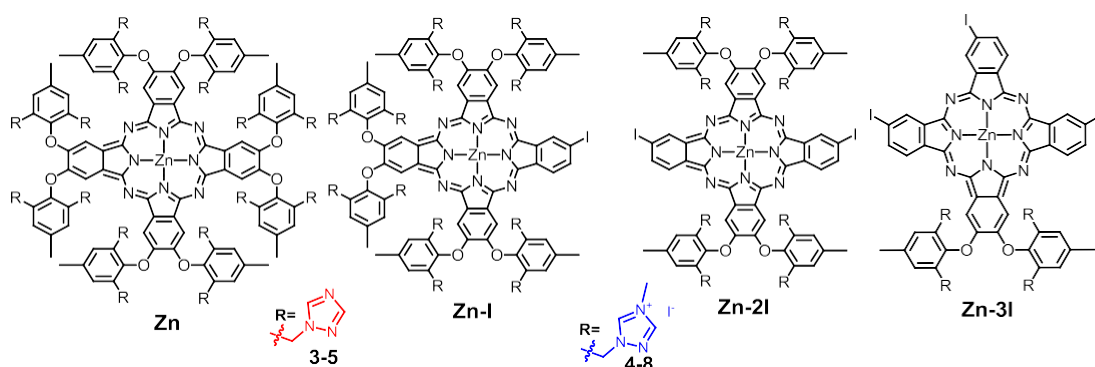
Basma Ghazal,^a Ali Husain,^a Mahmut Durmuş^{b,||} and Saad Makhseed^{*,a}

^a Department of Chemistry, Kuwait University, P.O. Box 5969, Safat, 13060, Kuwait

^b Gebze Technical University, Department of Chemistry, P.O. Box. 141, 41400 Gebze-Kocaeli, Turkey

The key parameters required to be demonstrated by the phthalocyanine (Pc) as an efficient photosensitizer in PDT is the non-aggregation behavior and high singlet oxygen quantum yield in aqueous media.¹ However, Pc molecules are commonly characterized by their low solubility and strong aggregation in water and therefore many protocols have been adapted to overcome this obstacle. Recently, the introduction of bulky substituents bearing quaternized triazolyl moieties at the periphery of the Pc core were found to be the most efficient approach leading to freely water-soluble **Zn** derivative in non-aggregated form.² Consequently, excellent photodynamic activity on Hela cells with IC₅₀ = 12 nM ($\lambda > 570$ nm, 11.2 J cm⁻²) and low dark toxicity (TC₅₀ = 369 μ M) were achieved using the photosensitizer **Zn**.

Succeeding the concept of the aforementioned achievements, three new asymmetrical zinc Pcs (**Zn1**: AAAB, **Zn2I**: AABB and **Zn3I**: ABBB) were prepared by statistical condensation of two substituted phthalonitriles (A: 4,5-Bis{2,6-bis[(1H-1,2,4-triazol-1-yl)methyl]-4-methylphenoxy}phthalonitrile and B: 4-iodophthalonitrile) and their structural identifications were confirmed. Photophysical and photochemical analyses of the prepared complexes were performed (Φ_{Δ} in water is 0.901 for the best compound) and their results confirm the constructive impact of the existence of iodine atom and quaternized triazolyl moiety in unimolecular Pc structure. As a consequence, the fundamentally basic properties for therapeutic application (PDT): tuning the hydrophilic-hydrophobic balance, the absence of aggregation and efficient singlet oxygen generation in aqueous media were significantly accomplished



References (10 pt)

1. Surname, M. *Angew. Chem., Int. Ed. Engl.* **1989**, 28, 322-325. (10 pt)
2. Surname, R. J. *Bioorg. Med. Chem.* **2002**, 10, 3379-3383.

Acknowledgements: This work was funded by the Kuwait Foundation for the Advancement of Science (Grant Number P114-14-SC01).

CHEMISTRY EDUCATION IN THE 21ST CENTURY: MEETING THE CHALLENGES

David Read

Faculty of Natural and Environmental Sciences, University of Southampton, Southampton, SO17 1BJ,
UK.

e-mail: d.read@soton.ac.uk

Chemistry is a difficult subject for learners and teachers alike, particularly in view of the visual nature of the subject. Advances in technology have transformed teaching in the discipline, as well as altering the perceptions of incoming university students who have very different prior experiences to those who are teaching them. The availability of technology to support teaching presents educators with new opportunities as well challenges, meaning that this is a dynamic and exciting time in which to teach chemistry.

This talk will discuss the nature of the challenges facing chemistry educators in the 21st century, as well as the role of technology in supporting students to achieve their potential and develop the skills required for success in the modern workplace. In particular, pioneering work carried out at the University of Southampton on the use of video and multimedia resources in chemistry teaching will be showcased, and other related work by current leaders in the field of chemical education will be discussed. The goal will be to share ideas about current best practice in the use of learning technology to support chemistry teaching and to provoke discussion amongst audience members regarding how best to capitalize on its use in the classroom, whatever the setting.

References:

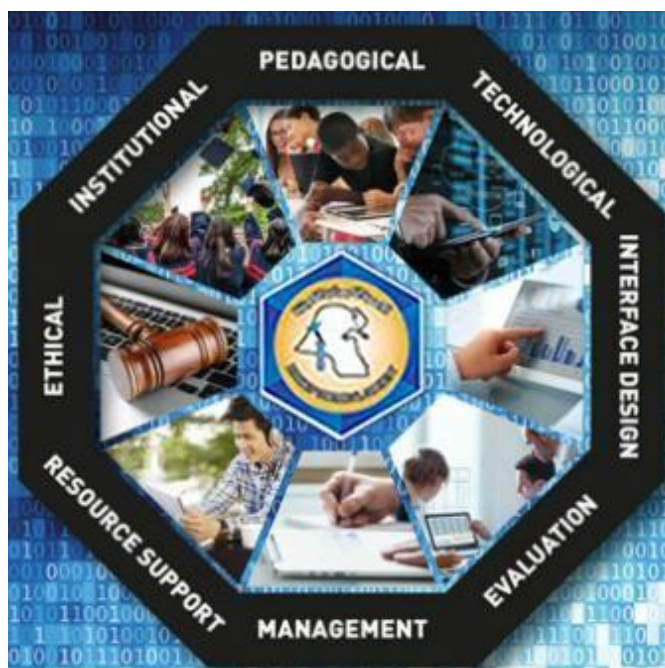
1. S. J. Lancaster and D. Read, *Educ. Chem.* **2013**, 50(5) 14-17.
2. D. Read, J. K. Watts, and T. J. Wilson, 'Partial Flipping to Support Learning in Lectures' in *The Flipped Classroom*, ACS Publishing, **2016**.
3. R. C. Brown, J. D. Hinks and D. Read, *New Dir. Teach. Phys. Sci.*, **2012**, 8, 33-37.

MEANINGFUL INTEGRATION OF LEARNING TECHNOLOGIES IN CHEMISTRY

Baderul Khan

McWendon Education, USA, Email: badrulkhan2003@yahoo.com

With the advancement of digital technologies, all disciplines including Chemistry are taking advantage of applying technologies for improving instruction and learning. The field of e-learning with the meaningful utilization of digital technologies has gained enormous and overwhelming attention globally with the rise of Massive Open Online Courses (MOOCs), a recent development in e-learning. E-learning has the potential to provide quality education and training over the Internet for millions of participants globally. However, the design, development, evaluation, and implementation of e-learning systems require thoughtful investigation and analysis; and of how to use the attributes and resources of the Internet and digital technologies in concert with instructional design principles encompassing various issues important to digital learning environments. In this presentation "A Framework for E-Learning" will be introduced which examines various critical issues of online/blended learning environments and various e-technologies from the perspectives of institutional, management, technological, pedagogical, interface design, resource support, evaluation and ethical considerations.



“LAB ON A PAPER” A PROMISING APPROACHES FOR TEACHING CHEMISTRY IN SCHOOLS.

Haider A. J. AlLawati

Sultan Qaboos University, Box 36, Al-Khod 123, Oman

email: haiderl@squ.edu.om

In many schools in the Arab world, students may not be exposed to many chemical concepts because their laboratories lack the appropriate equipment and supplies. As a result, students may perceive scientific processes in a traditional way without conducting any experiments.

Paper based microfluidics has many advantages such as speed of fabrication, low cost and simplicity. Therefore it can be easily used in educational field to demonstrate the various chemical concepts.

Paper based devices can be prepared easily by patterning hydrophobic walls of wax in hydrophilic paper using a commercially available printer and an oven. The fabrication process involves two core operations: (i) printing patterns of wax on the surface of paper and (ii) melting the wax into the paper to form complete hydrophobic barriers. This produces a channel that can be used to carry out various chemical processes such as mixing and reactions (Figure 1 and 2).

Various detection techniques can be implemented; however, the simplest one is colorimetric method which is well suited for schools. By mixing drops of sample and reagents, quantitative data can be obtained simply by the colour intensity of reflected light of the spot which can captured using digital camera and then processed using freely available software's.

The utilization of lab on a paper technology in the schools will prepare students to the future research field in the chemical sciences. Additionally, students will gain confidence and understand the chemical concepts. Obviously the student will also actively participate in the learning process and will have fun at the same time.

The objective of this work is to introduce the latest technology in the research field to the high school students through several simple, cost effective “lab on a paper” experiments that can be easily conducted in high school chemistry laboratory.

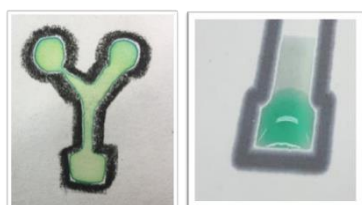


Figure 1: Solution is passing through a channel in a lab on paper device. The channels were fabricated using a) wax pen (left), b) wax printer (right)

References:

Carrilho, E., Martinez, A. W., Whitesides, J. M., *Anal. Chem.* **2009**, *81*, 7091–7095.

Acknowledgements: This work was funded by His Majesty Trust Funds (SR/SCI/CHEM/2016/01)

BIONANOCOMPOSITE REGENERATED CELLULOSE FILMS USING IONIC LIQUID SOLVENT

Mat Uzir Wahit^{a,c}, Mohammad Soheilmoghaddam^b, Nurbaiti Abdul Hanid^c

^a *Center for Composites, Universiti Teknologi Malaysia (UTM), Johor Bahru, Malaysia*

^b *Australian Institute for Bioengineering and Nanotechnology,
University of Queensland, St. Lucia, Australia*

^c *Department of Bioprocess and Polymer Engineering, Faculty of Chemical and Energy Engineering,
Universiti Teknologi Malaysia (UTM), Johor Bahru, Malaysia.
r-uzir@utm.my, mat.uzir@cheme.utm.my*

In recent years, the development of environmentally friendly materials obtained from renewable resources has attracted immense interest due to the new sustainable development outlook. Cellulose is a readily available, naturally occurring biodegradable, and biocompatible linear polysaccharide which gained significant attention and research interest due to its potential application as an alternative substitute for non-biodegradable materials. However, the key challenge for widespread use of cellulose is disruption of the large amount of intra- and intermolecular hydrogen bonds along and among chains to dissolve it in desired solvents. Recently, room temperature ionic liquids (ILs) have been used as solvents to produce regenerated cellulose (RC) due to their attractive properties such as good chemical and thermal stability, low flammability, low melting point, and ease of recycling. Although, ILs can serve as excellent alternatives to conventional organic solvents for cellulose, but poor mechanical properties as well as low thermal stability of cellulose has strictly limited its application. Therefore, cellulose/nanofiller nanocomposites are believed to have strong potential to widen polymer applications due to enhanced performance. It is also widely accepted that, the incorporation of small amount of nanofiller into bio-based matrixes can enhance the mechanical, thermal and other physio-chemical properties of the nanocomposites. Therefore, in this work we studied the effect of clay based nanofillers such as halloysite nanotubes (HNT), sepiolite, zeolite^[1] and vermiculite (VMT) incorporation into the RC matrix using ILs as the solvent and it has been compared with the effect of carbon-based nano-fillers incorporation such as graphene nanoplatelets (GNP) and single-walled carbon nanotube. Finally, it is noteworthy that the introduction of nanofillers without any surface modification has demonstrated a good enhancement in the thermal, mechanical, gas and water permeability of fabricated RC films using an environmentally benign ionic liquids

LAB-ON-A-CHIP TECHNOLOGY FOR CHEMICAL & BIOMEDICAL ANALYSES: FUNDAMENTALS, RECENT PROGRESS, AND FUTURE PERSPECTIVES

Abdulilah Dawoud Bani-Yaseen

*Department of Chemistry & Earth Sciences
College of Arts & Sciences, Qatar University
P.O. Box: 2713, Doha, State of Qatar
e-mail: abdulilah.baniyaseen@qu.edu.qa*

The lab-on-a-chip technologies, or as synonymously known as micro Total Analysis Systems (μ -TAS), have recently demonstrated various aspects of applicability as promising revolutionizing techniques that can be potentially employed for wide spectrum of applications. In principle, employing these technologies can exhibit superior advantages over conventional analytical methodologies including portability, speed, integrability and automation, versatility, and more importantly reduced chemical volumes needed for analysis. In this presentation, we aim to deliver an overview about the lab-on-a-chip technologies regarding a variety of perspectives concerning the historical background of innovation, micro- and nano-fabrications, modes of operation, and recent applications and future perspectives. However, more emphasis will be focused on our own research activities related to these technologies [1-5]. In particular, the operativity of capillary-electrophoresis-based μ -TAS for the separation and electrochemical sensing of various types of analytes, including DNA and protein adducts, will be presented.

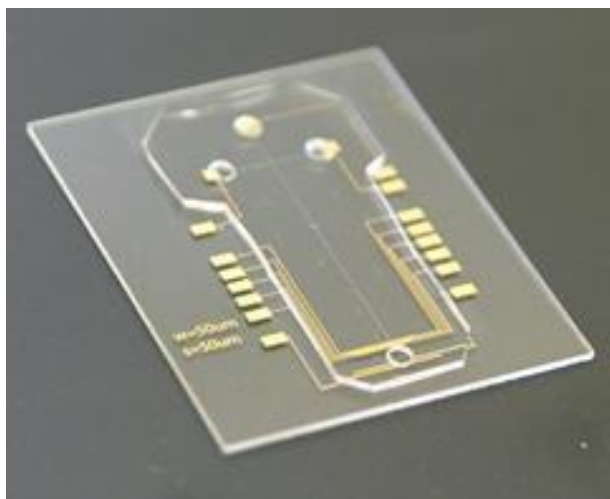


Figure 1. Integrated microfluidic system for the separation and electrochemical detection of DNA adducts.

References

1. Bani-Yaseen, A.D.; Kawaguchi, T; Price, A.K.; Culbertson, C.T.; Jankowiak, R.; *Anal. Bioanal. Chem.* **2011**, 399, 519-524.
2. Bani-Yaseen, A.D.; *IEEE Sens. J.* **2009**, 9 (2), 81-86.
3. Bani-Yaseen, A.D.; Kawaguchi, T; Markushin, Y.; Porter, M.D.; Jankowiak, R.; *Sensor Actuat. B-Chem.* **2006**, 120 (1), 42-50.
4. Dawoud Bani-Yaseen, A; Sariya, H; Lazar, I; *Electrophoresis* **2007**, 28, 4645 – 4660.
5. Dawoud Bani-Yaseen, A.; Kawaguchi, T; Jankowiak, R.; *Electrochem. Commun.* **2007**, 9, 1536–1541.

PLANT EXTRACT MEDIATED ECO-FRIENDLY SYNTHESIS OF Pd@GRAPHENE NANOCATALYST: AN EFFICIENT AND REUSABLE CATALYST FOR THE SUZUKI-MIYAURA COUPLING

Mujeeb Khan^a, Mufsir Kuniyil^a, Mohammed Rafi Shaik^a, Merajuddin Khan^{a,*}, Syed Farooq Adil^a, **Abdulrahman Al-Warthan**^a, Hamad Z. Alkhatlan^a, Wolfgang Tremel^b, Muhammad Nawaz Tahir^b, and Mohammed Rafiq H. Siddiqui^{b,*}

^a Department of Chemistry, College of Science, King Saud University, P.O. 2455, Riyadh 11451, Saudi Arabia.

^b Institute of Inorganic and Analytical Chemistry, Johannes Gutenberg-University of Mainz, Duesbergweg, 55128 Mainz, Germany;
e-mail: awarthan@ksu.edu.sa

Suzuki-Miyaura coupling reaction catalyzed by the palladium (Pd)-based nanomaterials is one of the most versatile methods for the preparation of biaryls. However, use of organic solvents as reaction medium causes a big threat to environment due to the generation of toxic byproducts as waste during the work up of these reactions. Therefore, the use of water as reaction media has attracted tremendous attention due to its environmental, economic, and safety benefits. In this study, we report on the synthesis of green Pd@graphene nanocatalyst based on an in situ functionalization approach which exhibited excellent catalytic activity towards the Suzuki–Miyaura cross-coupling reactions of phenyl halides with phenyl boronic acids under facile conditions in water. The green and environmentally friendly synthesis of Pd@graphene nanocatalyst (PG-HRG-Pd) is carried out by simultaneous reduction of graphene oxide (GRO) and PdCl₂ using *Pulicaria glutinosa* extract (PGE) as reducing and stabilizing agent. The phytomolecules present in the plant extract (PE) not only facilitated the reduction of PdCl₂, but also helped to stabilize the surface of PG-HRG-Pd nanocatalyst, which significantly enhanced the dispersibility of nanocatalyst in water. The identification of PG-HRG-Pd was established by various spectroscopic and microscopic techniques, including, high-resolution transmission electron microscopy (HRTEM), X-ray diffraction (XRD), ultraviolet–visible spectroscopy (UV-Vis), Fourier transform infrared spectroscopy (FT-IR), and Raman spectroscopy. The as-prepared PG-HRG-Pd nanocatalyst demonstrated excellent catalytic activity towards the Suzuki-Miyaura cross coupling reactions under aqueous, ligand free, and aerobic conditions. Apart from this the reusability of the catalyst was also evaluated and the catalyst yielded excellent results upon reuse for several times with marginal loss of its catalytic performance. Therefore, the method developed for the green synthesis of PG-HRG-Pd nanocatalyst and the eco-friendly protocol used for the Suzuki coupling offers a mild and effective substitute to the existing protocols and may significantly contribute to the endeavors of green chemistry.

References:

1. Alemán, J. Cabrera, *Chem. Soc. Rev.* **2013**, *42*, 774–793.
2. Chng, L.L. Erathodiyil, N. Ying, J.Y. *Acc. Chem. Res.* **2013**, *46*, 1825–1837

Acknowledgements: This project was supported by King Saud University, Deanship of Scientific Research, College of Science, Research Centre.

SMART MATERIALS FOR ENERGY SAVING APPLICATIONS

Afshin Hadipour

Imec, Kapeldreef 75
Leuven, Belgium
e-mail: hadipour@imec.be

Buildings use as much as 40% of the world ' s total primary energy. This huge energy consumption is mainly due to poor designs. One road toward more energy efficient buildings is to employ design principles that are in harmony with the radiation in our natural surroundings. To do so, smart materials can be used for energy saving future buildings. As introduction, this presentation will discussed relation between solar radiation and buildings climate. As main subject, two type of material systems for electro-chromic and thermo-chromic coatings will be discussed. At the end, conclusions and future plans will be mentioned.



PLASTICS AND MICROPLASTICS IN COASTAL AREAS OF KUWAIT: AN EMERGING POLLUTANT

Talat Saeed

*Environment and Climate Program, Environment and Life Sciences Research Center
Kuwait Institute for Scientific Research, Kuwait
tsaeed@kisir.edu.kw*

Discarded plastic in marine environment has become an important environmental issue in the last 15 years all over the world. About half of the plastic produced each year is discarded and up to 10% of produced plastic ends up in the oceans, where it persists and accumulates for long time. Large plastic fragments eventually degrade into smaller pieces called microplastics (5 mm or less) which are considered to be harmful to the marine ecosystem due to their bio-available size, magnification of harmful pollutants, and release of degradation products and additives (Andrady, 2011). There is no information on microplastics in Kuwait's coastal water and a little for the Arabian Gulf (Castillo et al., 2016). KISR is addressing this emerging pollution in Kuwait's coastal areas by undertaking a study. In this study, Kuwait's beaches, seawater, and marine biota were sampled. Sediment samples were collected from 50 locations along the Kuwait's coast. Seawater sampling was conducted during 40 1-km trawls in coastal waters using 0.3-mm neuston net (Fig. 1). Clams and fish were examined for the presence of microplastics. Microplastic fragments were separated from these matrixes, cleaned, counted and chemically treated to remove nonplastic material and characterized using Raman spectrometry. This presentation will cover the initial findings of the study and assess the magnitude of the threat in relation to the results obtained from other coastal areas of the world especially those obtained in the Arabian Gulf region.

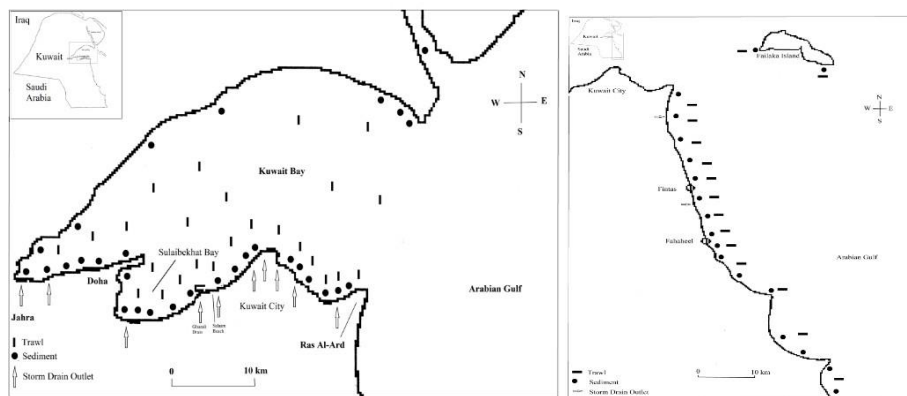


Figure 1. Microplastics sampling locations in Kuwait coastal areas

References (10 pt)

1. Andrady, L. *Mar. Poll. Bull.* **2011**, *62*, 1596-1605.
2. Castillo, A. B., Al-Maslamani, I., Obbard, J. P. *Mar. Poll. Bull.* **2016**, *111*, 260-267.

Acknowledgements: This work was partially funded by Kuwait Foundation for the Advancement of Sciences (KFAS).

Kuwait Conference of Chemistry - 2018



Oral Lectures

THE EFFECT OF DIFFERENT BEVERAGES ON THE SURFACE STRUCTURES OF ORTHODONTIC NANO-HYBRID COMPOSITES

Bedoor Alnaser¹, and Abdulsalam Alhazza²

¹Ministry of Education, Chemistry department, ²Nanotechnology & Advanced Materials Program, Energy & Building Research Centre, Kuwait Institute for Scientific Research (KISR), P.O. Box 24885, Safat 13109; Kuwait.

Orthodontic Nano-hybrid composite resin is a new composite material used for filling tooth cavities in the dental clinics nowadays. In this work, number of commercial drinks (with different PH values) were used to study the behavior of this material after exposed to these solutions for certain times. Samples were placed in six solutions and the material were examined under Scanning Electron Microscopes (SEM) before exposure and after one, and two months to evaluate the changes in the surface (acid attack). Number of SEM images were taken for each sample with different magnifications. There is an evident of an obvious damage on the resin surface according to acidic behavior of these beverages.

Key words: Nano-hybrid, composite, PH values, acid attack, behavior

TITANIUM NANOCOMPOSITES BASED CATALYSTS IN WASTEWATER TREATMENT

Halema Al-Kandari^{1*}, Aoubakr Abdullah², Ahmed Mohamed³, and Shekhah Al-Kandari³

¹ Department of Health Environment, College of Health Sciences, PAAET, Kuwait

² Center for Advanced Materials, Qatar University, Doha, P.O. Box 2713, Qatar. Chemistry

³ Chemistry Department, Kuwait University, P.O. Box 5969 Safat, 13060, Kuwait

INTRODUCTION

TiO₂ is one of the most utilized photocatalyst. However, there are some challenges regarding the use of TiO₂ on an industrial scale. For example, TiO₂ has a relatively high-energy band gap [1-2]. Significant attention is directed towards using carbonaceous nanomaterials such as graphene and carbon nitride along with TiO₂ to enhance its photocatalytic behavior due to their unique and controllable structural and electrical properties. Combinations of ozone or hydrogen peroxide with ultraviolet radiation in water can generate powerful oxidants that are useful for the advanced oxidation processes (AOPs). In this work, we used graphene oxide and carbon nitride nanocomposites in advanced oxidation process for treatment of water contaminated with phenolic compounds and some dyes.

EXPERIMENTAL

Graphene oxide powder (GO) was prepared using a modified Hummers' method [3]. GO and carbon nitride (CN) was loaded on TiO₂ using hydrothermal treatment. All photocatalysts were characterized using XRD, XPS, Raman and BET were also measured

RESULTS AND DISCUSSION

Table 1 showed rate constant data in min⁻¹ of phenol (20 mg L⁻¹) on Ti and rGOTi under 150 Xe illumination in absence and absence of 70 μL H₂O₂ and/or O₃. From this table, as can see that the photodegradation percentage increases with time regardless the type of photocatalyst or the phenol used. Secondly, adding H₂O₂ or O₃ to the reaction mixture increased the rate of phenol degradation compared to bare catalyst regardless of the type of photocatalyst or the tested phenolic compound. This is mainly due to the increase in the formation of hydroxyl radicals and inhibition of the electron/hole (e/h⁺) pair recombination. Finally, the best degradation of phenol was observed in presence of both H₂O₂ and O₃, in which 83.7 % degradation was obtained after 30 min and the rate constant was 0.062 min⁻¹.

Table 1: Rate constant data in min⁻¹ of phenol (20 mg L⁻¹) on Ti and rGOTi under 150 Xe illumination in absence and absence of 70 μL H₂O₂ and/or O₃.

| Xe | | Xe + H ₂ O ₂ | | Xe + O ₃ | | Xe + H ₂ O ₂ + O ₃ | |
|-------|-------|------------------------------------|-------|---------------------|-------|---|-------|
| Ti | rGOTi | Ti | rGOTi | Ti | rGOTi | Ti | rGOTi |
| 0.021 | 0.023 | 0.028 | 0.032 | 0.025 | 0.026 | 0.038 | 0.062 |

CONCLUSION

Photocatalytic degradation of phenolic compounds on TiO₂ nanoparticles in presence of Xe illumination were improved drastically upon loading it with 0.33 % rGO. Based on data obtained rGOTi nanocomposite can be considered as a promising candidate for the photocatalytic degradation of phenolic compounds in wastewater when both H₂O₂ and O₃ were added to the rGOTi nanocomposite

REFERENCES

- [1] M. Tian, G. Wu, B. Adams, J. Wen, A. Chen, Kinetics of photoelectrocatalytic degradation of nitrophenols on nanostructured TiO₂ electrodes, *J. Phys. Chem. C*, 112 (2008) 825-831.
- [2] L. Liu, H. Liu, Y.-P. Zhao, Y. Wang, Y. Duan, G. Gao, M. Ge, W. Chen, Directed Synthesis of Hierarchical Nanostructured TiO₂ Catalysts and their Morphology-Dependent Photocatalysis for Phenol Degradation, *Environ. Sci. Technol.*, 42 (2008) 2342-2348.
- [3] W.S. Hummers, R.E. Offeman, Preparation of graphitic oxide, *J. Am. Chem. Soc.*, 80 (1958) 1339-1339.

ACKNOWLEDGMENTS

This work was supported and funded from the Public Authority of Applied Education and Training (PAAET) under research project # HS-17-04

FABRICATION OF HIGHLY EFFICIENT NON-ENZYMATIC GLUCOSE SENSOR COMPOSED OF NiO@SiNPs COMPOSITE MATERIALS

Gowhar Ahmad Naikoo^a, Mehraj Ud Din Sheikh^b

*^aDepartment of Mathematics and Sciences,
College of Arts and Applied Sciences
Dhofar University, Salalah, Sultanate of Oman
e-mail: naikgowhar@gmail.com/gahmed@du.edu.om*

*^bNanomaterials Discovery Laboratory
Department of Chemistry
Dr. Hari Singh Gour University, Sagar, India*

Diabetes is catching a great attention because of alarming increase in death rate worldwide¹. Thus to monitor blood glucose level and prevent life-threatening impact of diabetes, scientists are consistently working on the development of advanced electrochemical sensors, especially for glucose detection². In the present work, a facile, time saving, economical and environmentally friendly modified sol-gel approach has been explored for the synthesis of NiO and NiO@SiNPs nanostructures for the development of highly efficient non-enzymatic glucose Sensor. The synthesized materials were well characterized by Powder-X ray diffraction (PXRD) and field emission scanning and transmission electron microscopy (SEM and TEM). The sorption studies were carried out by BET surface area analyzer. Cyclic Voltammetry and Differential Pulse Voltammetry methods were employed to investigate the catalytic properties of the fabricated electrode materials for glucose electro-oxidation in alkaline media. The NiO@SiNPs developed non-enzymatic sensor exhibited excellent performance for glucose sensing with extremely low detection limit (0.08 μM) and an ultrahigh sensitivity of $445 \mu\text{A}\mu\text{M}^{-1}\text{cm}^{-2}$ which could be attributed to the addition of silica nanoparticles on the surface of NiO that offered large surface area for the electro-oxidation of glucose. Hence, NiO@SiNps composite electrode materials will serve as a highly promising candidate for the development of efficient electrochemical sensors for reliable glucose determination.

Keywords: NiO composite materials; sol-gel method; non-enzymatic glucose sensor

References:

1. World Health Organization (WHO). Global Report on Diabetes, Geneva, 2016.
2. Zhang, M. et al. *Sci. Rep.* 2015, **5**, 8311

DETERMINATION OF CARBARYL AT MODIFIED CARBON PASTE ELECTRODE BY LOW SILICA X ZEOLITE OR POLYMERIC FILM

M. EL RHAZI*, F.EZ. SALIH, B. ACHIOU, M. OUAMMOU, S. ALAMI YOUNSSI.

*¹Laboratory of Materials, Membranes and Environment,
Faculty of Sciences and Technologies -BP 146 Mohammedia 20650,
University Hassan II of Casablanca, Morocco.*

*elrhazim@hotmail.com

Two simple approaches for the determination of carbaryl in natural samples were proposed using low silica X zeolite or polymer film modified carbon paste electrode [1]. In the first one, a small amount of low silica X zeolite with a porous structure was incorporated into carbon paste electrode. In the second one, the polymer poly(paraphenylenediamine) was electrodeposited at the surface of the electrode by cyclic voltammetry. The modified electrodes were characterized by scanning electron microscope, cyclic voltammetry and electrochemical impedance spectroscopy. Various experimental conditions including effect of zeolite amounts, charge of the film, pH, accumulation time and differential pulse voltammetric parameters were optimized. Under optimal conditions, a linear response was obtained in the range of 1–100 μM of carbaryl using differential pulse voltammetry with a detection limit of 0.3 μM (S/N = 3). The sensors displayed good selectivity and stability. The sensors were applied for the determination of carbaryl in food samples with a good recovery [2].

Acknowledgments: This work was supported by MESRSFC (Ministère de l'enseignement Supérieur et de la Recherche scientifique et de la Formation des Cadres) and CNRST (Centre National pour la Recherche Scientifique et Technique) Project No: PPR/2015/72

[1] M. El Rhazi, S. Majid, Trends in environmental analytical Chemistry, 2(2014)33-42

[2] F. Ezzahra Salih, B. Achiou, M. Ouammou, J. Bennazha, S. Alami Younssi, M. El Rhazi, Journal of Advanced Research, Volume 8 (2017) 669-676

GREEN SYNTHESIS OF IRON OXIDE NANOPARTICLES USING ORANGE PEELS EXTRACT AND THEIR APPLICATION AS A TOOL FOR DRUG DELIVERY

Muhammad Zahid Qureshi¹, Rabia Hayee², Iqra Muneer³

Government College University, Lahore E-mail: rabiahayee1@gmail.com

In present research, iron oxide nanoparticles have been synthesized using cost effective and eco-friendly green method by the reduction of ferric chloride solution. Orange peels extract was used as reducing as well as capping agent. FTIR-Analysis of peels extract confirmed their reducing nature. Prepared IONPs was confirmed by UV-visible spectroscopy, which shows broad spectrum with peak at 430nm. Optimization of different experimental parameters i.e. temperature, pH and concentration of extract was carried out and results are compared by UV-visible spectrum. Optimum results obtained at 60°C, pH=12, amount of extract= 6ml and amount of precursors salt=10ml at 20 minutes of gentle stirring.

Synthesized nanoparticles were characterized by UV-Vis Spectrophotometer, FTIR, XRD and TGA. FTIR analysis shows the interaction between different functional groups present in peel extract and salt. Antioxidant potential of both synthesized iron nanoparticles and peel extracts was measured by using DDPH, reducing power and hydroxyl scavenging assays. IONPs exhibit non-hemolytic effect against fresh blood. Cytotoxic behaviour of these particles is measured in dose –dependent manner at various concentrations. In-vitro anticoagulation and stability tests confirmed the stability of Iron oxide nanoparticles.

Keywords: iron oxide nanoparticles, orange peel, hemolytic effect, Cytotoxic behaviour

**TO WHAT EXTENT DO SCIENCE TEACHERS FULFIL
TEACHING COMPETENCY FROM THE POINT OF VIEW OF
THE HEAD
OF SCIENCE DEPARTMENT IN MIDDLE SCHOOLS IN
THE STATE OF KUWAIT**

Manee AlManea

*Ministry of Education, Science Supervision, Aljahra, Kuwait
mnsdmm@yahoo.com*

The present study aims to examine to what extent do science teachers fulfil teaching competencies from the point of view of the head of science department in middle schools In the State of Kuwait. The study sample consisted of (56) head of science department in middle schools In the State of Kuwait. The study tool consisted of an online questionnaire about teaching competencies. The study used descriptive and analytic approach. The study came out with the following results:

- The availability of teaching competencies in general is medium with an arithmetic medium value (3.10).
- The availability of integrating technologies in the teaching process competencies came in the first place with an arithmetic medium value (3.16), and comes in last position the availability of humanitarian and personal competencies with an arithmetic medium value (3.07)
- There is no significant statistical difference ($\alpha = 0,05$) in the availability of teaching competencies in general among middle school students in the State of Kuwait due to gender.

In the light of these result the study made the following recommendations: Teaching competencies must be identified and listed and put in teaching code that must be covered in all teachers' preparation institutes.

Key Words: Teaching Competencies.

References:

Gaye Teksoz, Elvan Sahin, Hamide **Ertepinar International Journal of Environmental & Science Education** Vol. 5, No. 2, April 2010, 131-149

Adrienne Kozan Naumescu, Babeş-Bolyai, (2008). SCIENCE TEACHER COMPETENCIES IN A KNOWLEDGED BASED SOCIETY. **Acta Didactica Napocensia**. Volume 1, Number 1, 2008

CHEMISTRY: FROM THE PAST TO THE FUTURE (Arabic Language)

N. Al-Hamdan

Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait. e-mail: noufsalhamdan@gmail.com

When you go deeper into science, you have to know, what is it? How did it begin and develop during these years? What is the reason for its existence? What is chemistry? How did it exist and transfer from the old stage into the advanced stage? What is the reason for it is still developing today? How did it move from the simple to the complicated? What is the role of chemistry in the case of technical development?

There are a lot of questions asked during the lecture about the importance of chemistry and its applications.

References:-

1. Bensaude- Vincent, B., Stengers, I., A History of Chemistry, 1 st ed., Harvard University Press, London, England, 1996, p 39-41.
2. Kuhn, T. S., The Structure of Scientific Revolutions, 50 th ed, The University of Chicago, 2012.

تطبيقات تكنولوجية الواقع المعزز في تعليم وتعلم المواد العلمية

د. عبدالله الفيلكاوي

جامعة الكويت، كلية التربية، الكويت

e-mail: alfaiikawei@yahoo.com

أثر التطور التكنولوجي الذي يشهده العالم إلى جميع مناحي الحياة. ويأتي التعليم أحد هذه الحقول الذي تأثرت بهذا التطور. وتعد تكنولوجية الواقع المعزز **Augmented Reality** أحد أبرز التطورات في المجال التكنولوجي والتي دمجت بين الواقع الحيزي والواقع الافتراضي. نناول هذه المحاضرة مفهوم الواقع المعزز وأثره على التعليم بشكل عام، وعلى تعليم وتعلم المواد العلمية بشكل خاص. وكذلك، نناول المحاضرة بعض التطبيقات التي ننهد مع علم مواد العلوم لتوظيف هذه التكنولوجية في المقررات الدراسية. وسنقدم التركيز على تطبيق (HP Reveal) (Aurasma) كتمثال يساعد المعلم على صنع بيئة واقع معزز خاصة به من خلال اضافة صور/نصوص/رسم متحركة/فيديو على أسطح ثابتة. وأخيراً، نسقدم عرض مجموعة من الأفكار العملية التي ننهد مع علم في دمج تكنولوجية الواقع المعزز مع كنب العلوم في المراحل الدراسية المختلفة. وأيضاً، دمج تكنولوجية الواقع المعزز مع العروض التؤديمية، الواجبات المنزلية، التؤويم، اللوحة الحائطية، وترجمة المصطلحات العلمية التؤوية إلى العربية.

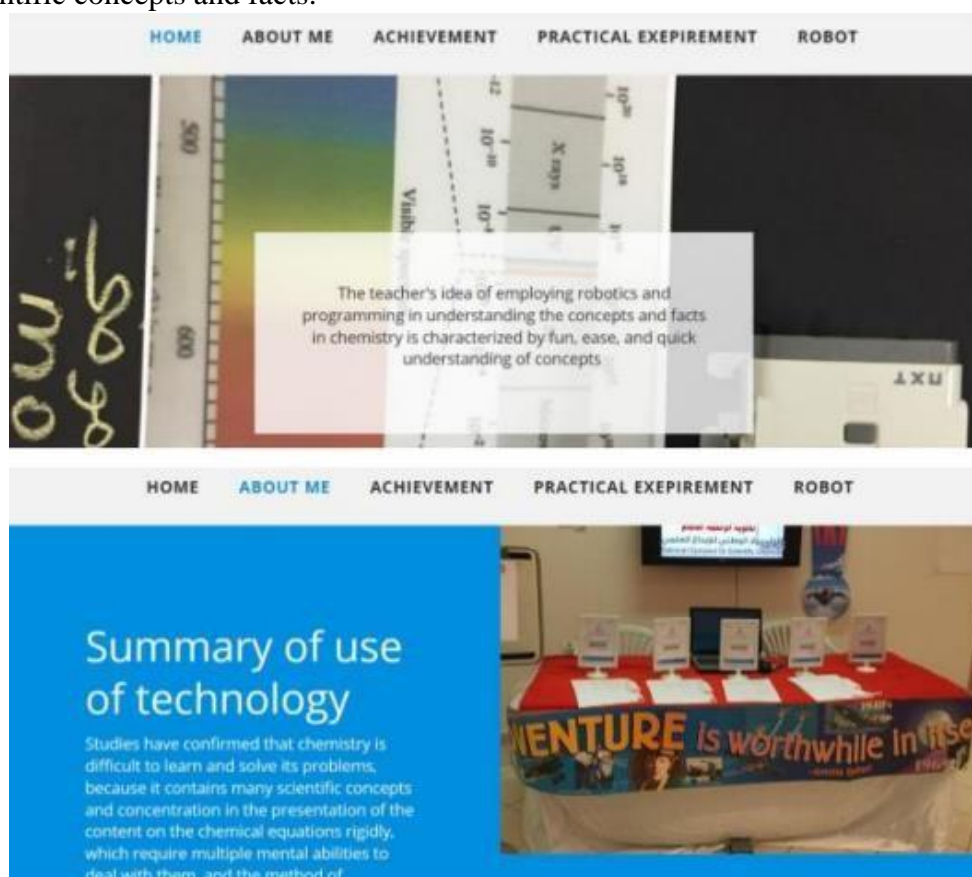
ROBOTIC CHEMISTRY

Moudi Fakhri Al-Mutairi

Chemistry teacher, Umm Salamah High School Kingdom of Saudi Arabia

Email :modai2022@yahoo.com

Studies have confirmed that chemistry is difficult to learn and solve its problems, because it contains many scientific concepts and concentration in the presentation of the content on the chemical equations rigidly, which require multiple mental abilities to deal with them, and the method of presentation of content is interested in the amount of information more than interest And does not provide sufficient learning experiences to understand the processes involved in chemical reactions, electronic arrangement in atoms and space domains in atoms, and is not very interested in scientific applications and focuses in its entirety on chemical concepts at different levels, Assessing students' retention of concepts, equations and chemical reactions without realizing their applications The results of other studies indicate that there are difficulties in the students' ability to solve the problems. These difficulties include: Difficulty in understanding the student's chemical equation and electronic distribution in the atoms and writing them correctly, and the difficulty of the student's understanding of the components necessary to solve the chemical problems and their inability to reach the level of ability required to solve the problem Which has led to a lack of interest in chemistry learning and low tendency towards learning. This has been evident from the results of the application of a measure of the trend of students towards the societal applications of chemical innovations and the decline of students' attitudes in this field. Experience has shown that these robots are very suitable for the training of teachers and students on them. They are simple, easy to use and inexpensive devices compared to delivering scientific information with pleasure and quick understanding of scientific concepts and facts.



PROTEOMICS ANALYSIS TOOLS TO STUDY VITAMIN D CORRELATION WITH EXPRESSION OF SEX-SPECIFIC IGFBP-2 AND IGFBP-3 IN TYPE-2 DIABETES RISK

Majed S. Alokail^{1,2}, Nasser M. Al-Daghri^{1,2*}, Antigoni Manousopoulou^{3,4}, Sobhy Yakout^{1,2}, Amal Alenad^{1,2}, Diana J. G aray-Baquero³, Miltos Fotopoulos⁴, Jie Teng⁴, Omar Al-Attas², Yousef Al-Saleh², Shaun Sabico^{1,2}, George P. Chrousos⁶ and Spiros D. Garbis^{3,4,5}

¹Biomarkers Research Program, Biochemistry Department, College of Science, King Saud University, KSA; ²Prince Mutaib Chair for Biomarkers of Osteoporosis, Biochemistry Department, King Saud University, KSA; ³Clinical and Experimental Sciences, Faculty of Medicine, University of Southampton, Southampton General Hospital, UK; ⁴Centre for Proteomic Research, Institute for Life Sciences, University of Southampton, UK; ⁵Cancer Sciences, Faculty of Medicine, University of Southampton, Southampton General Hospital, UK; ⁶1st Department of Pediatrics, University of Athens, Greece.

Vitamin D deficiency increases insulin resistance by impairing insulin secretion and compromising pancreatic beta-cell function, all hallmark features of type II diabetes. Recent findings suggest that supplementation with vitamin D could positively affect insulin secretion and glucose homeostasis. Normal and obese males and females that had low serum 25(OH) D3 (<25 ng/mL) were compared to those that had desirable 25(OH) D3 (>70 ng/mL) (n=4 for each cohort, n=16 total). The present quantitative serum proteomics study showed a novel sex-specific correlation between vitamin D status and favourable protein levels of IGFBP-2 and IGFBP-3 most prevalently in obese males and females. Analogous favourable protein expression traits for IGFBP-2 and IGFBP-3 were achieved in the one-arm 6-month Vitamin D intervention study in humans with similar clinical characteristics, constituting the independent validation cohort. Favorable protein expression levels for IGFBP-2 and IGFBP-3 were achieved in humans with desirable 25(OH) D3 serum levels (> 70 ng/mL) on reducing the risk of T2D.

NEW MODIFIED METHOD FOR DETERMINATION OF NITRIC OXIDE SYNTHASE ACTIVITY IN PLASMA OF VITILIGO PATIENTS

Jwan Abdulmohsin Zainulabdeen (J.A. Zainulabdeen)^a, Aymen Abdulsattar Dagher (A.A. Dagher)^b

^a Department of Chemistry, College of Sciences, University of Baghdad, Baghdad, Iraq

^b Department of Chemistry, College of Sciences, University of Baghdad, Baghdad, Iraq

e-mail: aemnabd@yahoo.com

Introduction: Vitiligo is a common skin disorder that characterized by depigmentation of skin due to melanocyte impairment which may be caused to increase levels of free radicals such as superoxide and nitric oxide causing an increase in oxidative stress. The purpose of this study was measured the activity of nitric oxide synthase (NOS) by our modified method and nitric oxide concentration in plasma of vitiligo patients.

Materials and Methods: The activity of nitric oxide synthase was determined via a modified method by coupling two methods (figure 1); the first method was based on converting L-arginine to L-citrulline and nitric oxide and the second was used to measure the concentration of nitric oxide. This modified method was applied to patients with vitiligo disease and apparently healthy individuals who matched in age and gender with patients.

Results: The condition of this modified method was optimized and the results revealed the following: the activity of NOS was higher in a solution that contains: Tris buffer (50mM), arginine (100mM), calcium chloride (20mM), and NADPH (5mM) during 30 minutes, meanwhile the precision of this method was 2.03. In the current study, the results show that the levels of NOS activity and nitric oxide were affected by the disease in which both parameters appeared highly significant increasing in vitiligo patients ($p=0.000$ and 0.002 respectively) in comparison with the healthy individuals.

Conclusion: Results of the experiments proved that it is possible to depend on the modified method to measure the activity of nitric oxide synthase (NOS). Also, the increased levels of NOS activity and nitric oxide concentration in vitiligo patients support the autotoxic hypothesis which suggests that melanocyte impairment could be related initially with oxidative stress.

MICROWAVE PREPARATION OF A NOVEL CHITOSAN/ACTF COMPOSITE FOR THE REMOVAL OF Ca^{+2} AND Ba^{+2} FROM UNDERGROUND WATER: ADSORPTION MODELING AND OPTIMIZATION

M. Fathy¹, R. Hosny², O.H.Abdelraheem^{3*}, and M.A. Zayed⁴

¹Application department, Petroleum Research Institute (EPRI), ²Production Department, Petroleum Research Institute (EPRI), 1 Ahmed El-Zomer St., Nasr City, Box.No. 11727, Cairo, Egypt,

³Chemical Engineering Department, Faculty of Engineering, Beni-Suef University, Beni-Suef 62512, Egypt

⁴Chemistry Department, Faculty of Science, Cairo University, Giza 12613, Egypt.

*omnia_hassan55@eng.bsu.edu.eg

A novel cross-linked biocomposite with a high adsorption capacity was prepared by incorporating amorphous carbon thin film (ACTF); synthesized from sawdust by catalytic acid spray method; into the chitosan biopolymeric matrix by microwave irradiation precipitation technique. The applied technique improves the polymeric cross linking effect between ACTF and chitosan with no need to a catalyst and does not affect the spatial structure of chitosan. The physico-chemical properties of the resulting composite were evaluated by FTIR, XRD, Raman, TEM, EDEX, TGA and SAED. The chitosan/ACTF composite analyses refers to the presence of cave-shaped pores, high electron density and ion exchange active sites on internal and external surfaces; in addition to high thermal stability and low swelling ratio value. The adsorption study summarize the potential of novel chitosan/ACTF composite for the removal of Ca^{+2} and Ba^{+2} from aqueous solutions by batch adsorption. The effect of adsorbent dose, contact time, initial solution pH and temperature were investigated. Equilibrium adsorption data was best fitted to Freundlich isotherm model. The adsorption kinetic data was well followed by pseudo-second-order kinetic model. Thermodynamic parameters (Gibbs energy, enthalpy and entropy) suggested endothermic nature of Ca^{+2} and Ba^{+2} adsorption. The results indicated a high adsorption capacity and excellent water compatibility. The adsorption capacities of Ca^{+2} and Ba^{+2} were 80 mg g⁻¹ and 87.85 mg g⁻¹ at initial concentration 100 mg/l, respectively, which promising for the purification of underground water

Keywords: Chitosan/ACTF composite, Microwave, Water treatment, Adsorption of Ca^{+2} and Ba^{+2} ions, Adsorption models, Adsorption kinetic.

EFFECT OF DIFFERENT GRAPHITE GRADES ON THE RESPONSE CHARACTERISTICS OF CLOMIPRAMINE HYDROCHLORIDE SENSORS AND ITS DETERMINATION IN BULK, PHARMACEUTICAL FORMULATIONS AND BIOLOGICAL FLUIDS

Sabrein H Mohamed^a, Yousry M. Issa^a, and Shaimaa A. Elfeky^b

^a: Chemistry Department, Faculty of Science, Cairo University, Giza, 12613, Egypt.

^b: Egyptian Chemistry Administration, Cairo, Egypt.

Clomipramine hydrochloride (CLPH.Cl) as a tricyclic antidepressant was analyzed by newly constructed sensitive coated wire sensors. These sensors are based on the use of clomipramine-tetraphenylborate (CLPH-TPB) as the electroactive matter. A mixture of 2.0% CLPH-TPB, 49.0% polyvinyl chloride (PVC) and 49.0% tricresyl phosphate (TCP) was used. Different wires and graphite pencils were checked for the nearest Nernstian behavior. The sensors displayed a slope of 58.71 ± 0.27 mV/decade over a linear concentration range of 1.0×10^{-3} -10.0 mmol/L with detection limit of 0.49 μ mol/L and correlation coefficient 0.9989. The sensors exhibit stable potential within the pH range 2.0-7.2 and show steady state potentials within 5-10 s. Moreover, the proposed sensors were used for the determination of CLPH.Cl in pure form, pharmaceutical formulations (Anafronil[®] tablets) and biological fluids (spiked human serum and urine) reaching limit of detection 30.0 nmol/L. The obtained recovery values lay in the range 98.28-103.66%. The results were statistically compared with the pharmacopoeil method, showing no significant difference with respect to its accuracy and precision.

CHEMICAL MODIFICATION OF WASTE VEGETABLE OIL FOR OIL AND GAS DRILLING INDUSTRY APPLICATIONS

Jothibasuramasamy

Saudi Aramco, KSA

e-mail: jothibasuramasamy@aramco.com

Various types of chemicals, polymers, base fluids have been used in oil and gas industry for drilling, production and reservoir engineering applications. Among these, drilling operations utilizes a majority of the chemicals and polymers for drilling fluid and cementing applications. Currently the industry is adopting ecofriendly products and additives to provide additional safeguards for regional and global environments and habitats. For this reason, products derived from fatty acids are a favorite choice due to their environmentally friendly nature. Chemical modification of fatty acids to the corresponding amides, esters and salts create several applications for drilling fluids such as emulsifiers for invert-emulsion oil based mud, lubricants for waterbased mud systems and wetting agents for oil based mud systems. Vegetable oil is a triglyceride which upon base or acid hydrolysis releases fatty acid and glycerol. Our objective is to use waste or used vegetable/cooking oil to extract fatty acids and convert them into drilling fluid additives for oil industry applications. This paper describes the development of fatty acids and the methyl ester of fatty acids from waste vegetable oil for applications as a base oil, lubricant, spotting fluid and emulsifier in drilling fluids.

DEGRADATION OF PROPHAM IN SUBCRITICAL WATER MEDIUM: APPLICATION OF BOX-BEHNKEN DESIGN

E. Yabalak, Ö. Görmez, A.M. Gizir

Mersin University, Faculty of Arts and Science, Department of Chemistry, Çiftlikköy Campus, TR-33343, Mersin, Turkey

e-mail: agizir@mersin.edu.tr

A large variety of organic pollutants are introduced into the aquatic system through various ways such as industrial and agricultural wastes. One of the most prominent of these pollutants is pesticides which are used to control of hazards of insects, weeds, and other pests. The removing of pesticides is an important problem for the environment. However, pesticides are highly toxic as well as resistant to degradation in natural water. Herbicides, which are used for controlling of unwanted plants, are the one of most used hazardous pesticides with insecticides [1,2]. There are many chemical methods used for the degradation of propham which belongs to herbicides group in pesticides. However, to the best of our knowledge, there is no work using subcritical water degradation method, for degradation of propham. Herein, subcritical water degradation, which is a green method, ensures effective medium for the degradation of organic pollutants present in water [3] and H_2O_2 , which is widely used in degradation process in the subcritical water medium, is a powerful and environmentally friendly oxidant [4]. Thus, we applied subcritical water degradation method to degrade propham in the presence of H_2O_2 . In addition, Response surface methodology (RSM), which is a statistical and mathematical modeling technique has been commonly used to evaluate the performance of a system. Box-Behnken Design (BBD) which is the most preferred method of the RSM, was used in this study for optimization of degradation propham [5].

The results of degradation were evaluated by BBD model and effects of system variables (temperature, x_1 , H_2O_2 concentration, x_2 , and treatment time, x_3) and their interactive and quadratic effects were determined. The approximation model of propham degradation was obtained and effect of each variables was displayed in Figure 1. It is clearly seen that temperature is the most

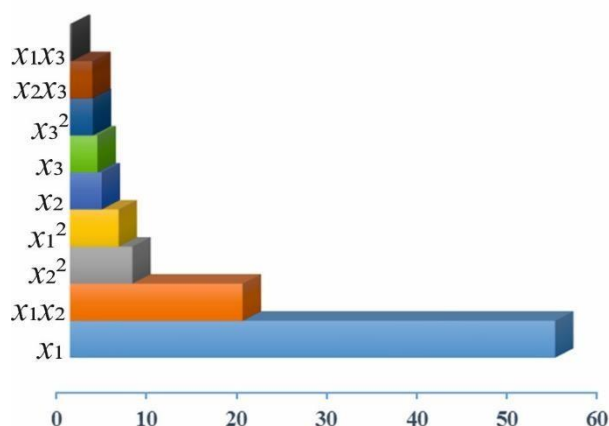


Figure 1. Pareto chart of the effect of the degradation model.

References

1. Muneer, M., Qamar, M., Saquib, M., Bahnemann, D.W. *Chemosphere* **2005**, *61*, 457-468.
2. Arribas, A.S., Bermejo, E., Chicharro, M., Zapardiel, A., *Talanta* **2007**, *71*, 430-436.
3. Kirmizakis, P., Tsamoutsoglou, C., Kayan, B., Kalderis, D. *J. Environ. Manage.* **2014**, *146*, 9-15.
4. Yabalak, E., Döndaş, H. A., Gizir, A. M. *J. Environ. Sci. Health, A* **2017**, *52*, 210-220.
5. Yabalak, E., Görmez, Ö., Gözmen, B., Gizir, A. M. *Int. J. Ind. Chem.* **2015**, *6*, 23-29.

TECHNO-ECONOMICAL ASSESSMENT FOR A NOVEL H₂ PRODUCTION PROCESS VIA CHEMICAL LOOPING TECHNOLOGY

H. Bahzad^a, P. Fennell^a, N. Shah^a, N. Mac Dowell^b, M. Boot-Handford^a, S. Masoudi^c

^a Department of Chemical Engineering, Imperial College of London, London, UK

^b Centre for Environmental Policy, Imperial College of London, London, UK

^c Department of Chemical Engineering, Brunel University London, UK

In this work, a new hydrogen production process (CLWSIC) *via* the CLWS technology has been developed and simulated using Aspen Plus. The process has been optimized *via* heat integration and sensitivity analysis for some of the main process parameters. The sensitivity analysis revealed the effects of the main parameters in the fuel and steam reactors on the process. These included the oxygen carrier to fuel and steam flow rate, discharged temperature of the gas and the solids on the gas and solids outlet conversions. The optimized ICLWSIC process was further thermodynamically investigated by determining its thermal and exergy efficiency and comparing these values with the ones obtained *via* the conventional SMR process. The economics of the process was finally evaluated by analyzing the corresponding CAPEX, OPEX and the first year plant cost per kg of H₂ produced. The thermal efficiency of the ICLWSIC process was improved by 16.3% compared to the original process (CLWSIC) and yet it is 8.3% higher than the conventional steam methane reforming (SMR) process. However, the carbon capture rate was decreased by 6% due to the usage of the 4% of the incomplete combustion gas from the fuel reactor in the process heat integration. From the sensitivity analysis, it was shown that the oxygen carrier to methane and steam fed ratio can impact the discharged gas and solids conversions from both the fuel and steam reactor. Also, the temperature of the discharged gas and solids from the fuel reactor effects the conversion of the discharged gas and solids for a certain value of the oxygen carrier to methane ratio unlike the steam reactor. The economic assessment of the process showed a first year cost of 1.86 \$/ kg of H₂, higher by 11.1% from previous study found in the literature, yet 14.7% lower than the SMR process.

INVESTIGATION OF HYDROGEN PRODUCTION BY USING SILVER COATED PLATINUM ELECTRODE IN PHOSPHATE SOLUTIONS

Mustafa Kemal Sangün¹ Güray Kılınççeker²

¹*Department of Chemistry, Faculty of Sciences and Letters, Mustafa Kemal University, 31060 Hatay, Turkey.*

²*Department of Chemistry, Faculty of Sciences and Letters, Cukurova University, 01330 Balcali, Adana, Turkey.*

Email: ksangun@gmail.com, gkilinc@cu.edu.tr

In this study, the hydrogen gas producing was investigated at 298 K with silver coated platinum (Pt-Ag) electrode. Electrolysis, electrochemical impedance spectroscopy (EIS) and potentiokinetic techniques were used for this purpose. The results showed that the efficiency of the hydrogen gas increased on the surface of the silver coated platinum electrode and the overvoltage in the system is decreased in the electrolysis system.

Key words: Hydrogen production, Silver, Covered Platinum, Electrolysis, Phosphate ions.

Acknowledgment

We would like to thank the Chemistry Department of the Faculty of Science and Letters of Cukurova University for supporting this work.

APPLICATIONS OF NEEM TREE PRODUCTS TO GREEN CONCEPTS

Ideisan I. Abu-Abdoun

*University of Sharjah Chemistry Department
P.O. Box 27272 Sharjah - UAE*

Neem is a green tropical tree that has versatile medical, health, ecological and cosmetic uses. It grows in tropical and semi-tropical regions, such as India, Malaysia, Pakistan, Sudan, United Arab Emirates, Kenya, neem tree is known by different names such as the “wonder tree”, “tree of the 21st century”, village pharmacy”, and the “blessed tree”. Neem products from oil, leaf, bark, flower, fruit, twig, gum, seed, have been used for their medicinal properties, controlling pests in plants, curing skin diseases, toothpaste, and adhesive for paintings. Neem can be a painless way to avoid severe dental problems; Neem extracts have been very useful in destroying cavity-causing bacteria.

Neem trees are one of the famous and well known trees in UAE, the products are cheap, easy to obtain and not poisonous to animals and friendly insects. General Application of neem parts/products will be introduced, with focus on uses in monitoring and control of museum environment, insect control and metal corrosion control will be presented.

SLUDGE PRODUCTION IN CHEMICAL PRECIPITATION

M.Salimi^a, L. Ydstebo^a

*a Department of mathematics and natural science, University of Stavanger, Stavanger, Norway
Email: msalimi1383@gmail.com*

Sentralrenseanlegg Nord-Jæren (SNJ) which is located in Randaberg (about ten kilometer north of Stavanger) can be considered as one of the largest wastewater treatment plants in Norway. Ferric chloride as in many other wastewater plants is used as a coagulant in wastewater treatment at Ivar (SNJ). Prediction the amount of sludge produced during the chemical treatment is essential to estimate the volume and retention time required for the sludge treatment. Observation at SNJ showed that the sludge production was not proportional with suspended solids removed or ferric chloride added. Laboratory-scale studies were carried out to investigate a corresponding relationship between the actual and expected sludge production during the coagulation and flocculation process. For this purpose, jar tests were conducted and effect of ferric chloride dosage on pH, conductivity, TSS, TSS- removal, alkalinity and calculated and measured sludge production as well as comparison of those two last parameters was investigated. Results achieved in the laboratory showed an acceptable conformity between the measured and calculated sludge productions, particularly in dilute wastewater samples which resulted in lesser amounts of sludge.

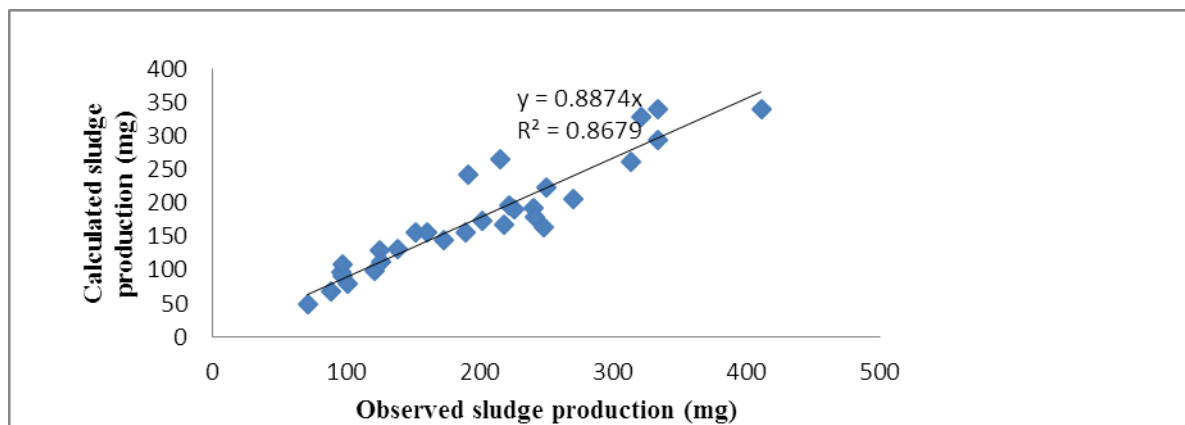


Figure 1. Expected and measured sludge production

References:

1. Bratby, J. (2006). Coagulation and flocculation in water and wastewater treatment (2nd ed. ed.). London: IWA Publ.
2. Hammer, M. J., & Hammer, M. J. (2004). Water and wastewater technology (5th ed. ed.). Upper Saddle River, N.J: Prentice-Hall.
3. Hantanirina, J. M. O. (2010). Improving BOD removal at SNJ wastewater treatment plant by biological treatment: University of Stavanger, Norway.
4. Mosquera, M. (2014). Chemical precipitation and treatment control parameters in wastewater treatment: University of Stavanger, Norway.

Kuwait Conference of Chemistry - 2018



Poster Presentations

CHALLENGES AND SUGGESTED SOLUTIONS IN CHEMISTRY EDUCATION IN THE HEALTH SCIENCES CENTER

M. Alansari^a, O. Habib^a, R. Khanafer^a, M. Bastaki^a

^a *Department of Biochemistry, Faculty of Medicine, Kuwait University, Kuwait*
e-mail: mohammed_a@hsc.edu.kw

Chemistry is the central science that is taught in the first academic year in health sciences center (HSC: Faculty of Medicine, Pharmacy, and Dentistry), Allied Health, Faculty of Engineering and Faculty of Science. It is a major component in the curriculum of medical school across the globe ¹. Chemistry is a major subject of Medical College Admission Test (MCAT)² as well as part of medical graduate examination (USMLE)³. From understanding of the basic chemistry, medical students build up their biochemistry which is known to be at the core of diagnostic medicine and research techniques.

Only the top students from high school are accepted into HSC. However, academic staff have noted a great variations among student's background in general chemistry, which is due to the lack of compulsory courses in advance chemistry in certain high school programs. These students were noted to have difficulties in understanding basic organic chemistry topics such as stereoisomerism; these important chemistry subjects are needed to understand properties and functions of biologically active macromolecules in biochemistry and pharmacology.

We are suggesting an innovative educational protocol to resolve this issue by introducing modern and advanced chemistry educational electronic applications and programs that can be used by their smart-pads and smart phones, where the students can visualize and understand 3D structural isomers while revision or instantly during the lecture. Furthermore, we are also suggesting the Ministry of Education standardize chemistry education curriculum in both private and governmental high schools or advice students who with-willing to apply to scientific collages of Kuwait University, to take the advance chemistry courses. We are also suggesting to establish a new undergraduate research project for chemistry and computer science students in Kuwait University, that aims to build 3D structural and chemistry equation application/programs to help in solving the obstacles encounters first year university students.

References

1. World Directory O Medical Schools. *World Health Organization, Geneva. 2nd ed., 1957*, p13,14,17,20,21,24,25.
2. The MCAT Essentials for Testing Year 2018, Association of American Medical Collages. USA, V10.11.2017, Pp6-7.
3. United States medical licensing examination content outline, FSMB and NBME, USA, 2017, P2,3,13,26.

DETERMINATION OF FLUORIDE LEVELS IN SOFT DRINKS, FRUIT JUICES AND MILK CONSUMED BY THE POPULATION IN KUWAIT USING AN ION-SELECTIVE ELECTRODE

M.E. Bhatti*, A. Al-Rashdan, Z. Al-Rashid, And S. Al-Ruwaih.

*Central Analytical Laboratory, Kuwait Institute for Scientific Research,
P.O. Box 24885, Safat, Kuwait. Tel: 00965-24989078 Fax: 00965-24989059
Email: mejaz@kisir.edu.kw*

Fluoride is an important anion present in various environmental, chemical and food samples. It is widely used in various branches of industry, and some fluoride compounds are formed as by-products in certain processes. Excessive amounts of fluoride in different compounds can enter the human body by means of polluted air, water and the food chain. Determination of fluoride in 86 food samples was performed by using an ion-selective electrode, as this method is simple, rapid and reliable. Fluoride concentrations were determined in the most-consumed fruit juices, soft drinks and milk samples among the population of Kuwait. A total of 15 soft drink samples available in the Kuwaiti markets were analyzed. The fluoride contents ranged from 0.05 - 0.15 mg/L, with an average of 0.06 mg/L. From the producer KDD, 16 fruit juice samples were selected from the markets and analyzed for fluoride content. The fluoride level ranged from 0.05 - 0.20 mg/L, within an average of 0.08 mg/L. The 32 other main brands of fruit juices available in the supermarkets were analyzed for fluoride content and found to be in the range of 0.03 – 0.15 mg/L, within an average of 0.05 mg/L. The total 23 samples from different brands of milk were selected and analyzed, finding fluoride levels in the range of 0.02 – 1.20 mg/L with an average of 0.08 mg/L. Fluoride concentration in all soft drinks, fruit juices and milk samples were within the safe level.

Keywords: Fluoride, ion-selective electrode, dental, caries, cancer, drinks.

IMPLEMENT OPERATING PROCEDURE FOR DYNAMIC BLOCKING TUBE RIG FOR SCALING STUDIES

K. Bouresli*, N. Al-Najdi

Petroleum Research Center, Kuwait Institute of Scientific Research, Kuwait, Kuwait

*e-mail: kboresli@kisir.edu.kw

This paper presents results from an investigating study for evaluation and ranking of scale inhibitors efficiency to reduce or prevent inorganic scale forming in oil production facilities in both upstream and downstream according to their compatibility to injecting water and formation water of the oil reservoirs. The injecting water is made of mixture of two chemically different waters used for injection. If the mixing waters were not chemically compatible, they will form inorganic scale.

Forming scale is costly problem causing loss in production, equipment, or the production reservoir itself. Dynamic tube blocking rig as well as static test was utilized to conduct the investigation of the injecting water. The importance of knowing the efficiency and the compatibility of the scale inhibitor is to produce oil from depleted formations as water injection technic to maintain the pressure of the oil reservoir and to sweep the oil to producing wells.

Dynamic blocking tube rig is equipment uses to compare the performance of scale inhibitors under pressure and temperature to mimic the oil reservoirs conditions. In addition, the static test was used to preliminary screening the scale inhibitors performance by finding out the worst water mixture.

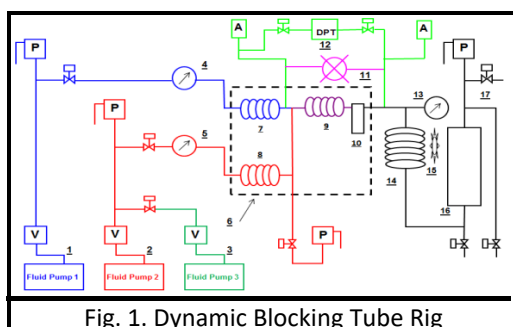


Fig. 1. Dynamic Blocking Tube Rig

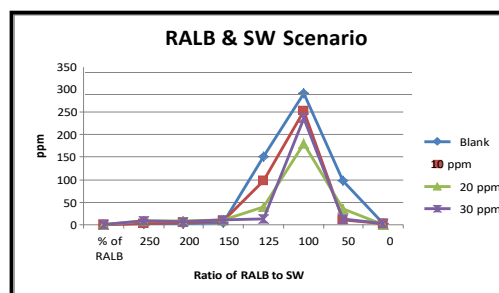


Fig. 2. Worst ratio of RALB and Seawater scenario

References

- Graham, G.M., I. R. Collins, R. Stalker, I. J. Littlehales. 2002. The Importance of Appropriate Laboratory Procedures for the Determination of Scale Inhibitor Performance. SPE-74679-MS. Presented at International Symposium on Oilfield Scale, 30-31 January, Aberdeen, United Kingdom.
- Graham, G. M., H. L. Williams, R. Wat, L. A. Tau, K. E. Wennberg. 2005. Design and Application of a Novel HT/HP "Stirred Reactor" Test Rig to Study Scale Formation and Control. SPE-93425-MS. Presented at SPE International Symposium on Oilfield Chemistry, 2-4 February, The Woodlands, Texas.

SUBSTITUTE CRMs FOR QUALITY CONTROL PURPOSES WITH IN-HOUSE QCM

Abdullah Essa Al-Oamous
ARAMCO/SALD, Kingdom of Saudi Arabia

The Southern Area Laboratories Division (SALD) has ISO/IEC 17025 accreditation and implementing of QA/QC program in all Units and part of the Laboratories quality management to monitor and validating of tests results. Results of quality control analysis are aimed to provide clear and fast information for the Acceptance of analytical results obtained on a batch of test samples Continuous use of controlMaterial allows estimation of the stability of performance of the instrument, including calibration, Analytical procedure, analyst, and influence of environmental conditions. Matrix is one of most common interference that effect choosing appropriate QA .The reference material is not available at all (matching neither matrix nor measured), in additional to that the CRM is too costly to be used for quality control of a larger number of analytical test runs. For that reason we conduct study the water samples collected from the different locations in the field for geo-chemical studies over a period of times to prepare QC for geo-chemical analysis.

CORRELATION OF THE CHEMICAL OXYGEN DEMAND OF HIGH SALINITY WATER USING Hg AND Hg-FREE COD VIALS AND THE EFFECT OF CHLORIDE ION

Meshari Saad Almutairi*

**School of Civil Engineering & Surveying, University Portsmouth,
Portland Building, Portland Street, Portsmouth, United Kingdom PO1 3AH.*

Tel: +447848688849

Email: meshari.almutairi@myport.ac.uk

Chemical Oxygen Demand (COD) is regarded as a fast and economical way in determining organics present in water. This study clarified the reason of the chloride (Cl^-) could be act as the main interference when measuring the COD values, the effect of chloride on COD reading was measured by adding different amount of marine salt (0.600 g (1.125% of mass), 1.125 g (2.250% of mass) and 2.250 g (4.5% of mass) to simulate different concentration of artificial seawater, while the concentrations of chloride were 6788 mg Cl^-/L , 13,577 mg Cl^-/L and 27,156 mg Cl^-/L , respectively. The outcome shown a linear correlation was established between Hg and Hg-Free COD vials. The mean of COD values at ratio (1:25) with mercury vials and mercury free vials were ranged between (216, 658 and 1042 mg /L) and (1725, 2199 and 2550 mg /L), repetitively. The results of Hg-free vials have been compared with that of Hg- vials and titration method. Comparative data analyses of the COD results were carried out to detect the interference obtained by chloride ion. The relation between Hg and Hg-free vials were tested on different types of water samples.

Keywords: COD, chloride ions, Hg-free vials, Hg vials, titration, interference.

**DEPLOYING A NEW MANAGEMENT PERFORMANCE
FEATURES IN KUWAIT OIL COMPANY'S OPERATIONAL
LABORATORIES USING LABORATORY INFORMATION
MANAGEMENT SYSTEM SOFTWARE**

Ahmed Abdulnabi Al-Hashemi, Saud Al-Sane

Kuwait Oil Company

As part of KOC's strategic plan to automate critical Business Processes and realizing the importance of technology investment, Operational Laboratories Team had successfully implemented state of the art Laboratory Information Management System (LIMS) in all laboratories across its facilities to enhance its laboratory operations.

Laboratory Information Management Systems (LIMS) are an increasingly important part of modern laboratory infrastructure, dealing with sample tracking, data storage and data reporting.

KOC- OL is increasing its investment in integrated laboratory software to further advance the company's business goals. This has led to create a new additional customized model in LIMS, in which it utilized in gathering, organizing, and summarizes comprehensive data that management can use for controlling, coordinating and decision making of against employees' performance and lab as well.

Keywords: Business, LIMS, Management

BLACK POWDER IN GAS LINES AT NK AREA

Faleh Al-Shammari, Fatma Sadeq

Kuwait Oil Company

Black powder was first observed in North Kuwait jurisdiction during the cleaning pigging of gas and Fuel pipelines. Once it is detected at the HP gas pipelines, then measures had to be taken to minimize risk and likely hood of failures. Chemical composition of black powder formed in North Kuwait mainly constituted of iron carbonates (FeCO_3), iron oxides (FeO) and iron sulfides (FeS), this was confirmed by XRD analyses. Black powder can be wet and dry (fine powder). It is produced due to high H_2S content, mixing of various types of crude, corrosion/erosion of internal service and microbial activity. Black powder accelerates the internal corrosion rates in pipelines. Deposits in the vessels leading to decreased life of equipment as well as efficiency loss. Blockage inside the facilities leading to production stoppages. This paper will explain the best practice used to mitigate the accumulation of the black powder using the pigging as mechanical tool to preserve the line from any debris accumulations

Keywords: Black powder, pigging, gas pipelines.

CHROMATOGRAPHIC SEPARATION OF SOME ANTIEPILEPTIC DRUGS.**A.Hamdi***USTHB, Faculty of chemistry, Algiers, Algeria*

In the present studies, chromatographic separation of some antiepileptic drugs, diazepam, valproic acid and verapamil after intravenous and oral administration to rats have been conducted. Stationary phase and mobile phase have been chosen and the parameters of mobile phase have been determined. Also pharmacokinetic parameters have been investigated. Reversed phase column (125x4.6 mm.i.d.) nucleosil 100-5 C18 with mobile phase consisting of ACN/butter phosphate, 75 mmol, pH 3(40/60 v/v%) and wave length 230 nm.

Keywords: separation, pharmacokinetics, antiepileptic drugs

References:

1. Acikgoz A., Karim N., Giris., Schmidt_Heck W., and Bader A., (2009) Two compartment models of diazepam biotransformation in an organotypical culture of primary human hepatocytes. *Toxicology and applied pharmacology* 234:179-191.
2. Chung JH., Choi DH. And Choi JS., (2009) Effect of oral epigallocatechin gallate on oral pharmacokinetics of verapamil in rats. *Biopharm. Drug Dispos* 30:90-93.
3. Desilva JAF., Koechli BA., and Bader R., (1966) Blood level distribution of diazepam and its major metabolite in man. *J.Pharm. Sci.* 55:692-702.
4. Rossetti AO. And Seeck M., (2010) Traitement medicamenteux actuel de l'epilepsie. *Revue medicale Suisse* 247 :901-906.
5. Souidi M., Dubrac S., and Parquet M., (2004) Oxysterols. Metabolism, Biological role and associated diseases. *Gastroenterol. Clin. Biol.* 28:279-93.

A NOVEL RESEARCH SYNTHESIS OF PHARMACEUTICAL PRODUCTS VIA CATENENES

H.Larkem, and A.Larkem

Department of Chemistry, Faculty of Sciences, University of Annaba,
Annaba 23000, Algeria.

E- mail: larkem_h@yahoo.fr

Diels-Alder cycloaddition of macrocyclic cyclopentadienone to fumaryl chloride to give carbonyl bridged adduct, followed by decarbonylation to produce (I) which was reacted with maleic anhydride to give the trans carbonyl chloride anhydride adduct, attachment of the medium chain of acetylenic alcohol to the trans carbonyl chloride of head bridged adduct to provide compound(II), followed by ring closure to form (III) in successful yield.

References:-

1. H. Larkem and A. Larkem. J. Chem. Chem.Eng. 6(2012).
2. H. Larkem and A. Larkem 3 rd International Conference on Pure and Applied Sciences Feb.02-06, Dubai 2017.

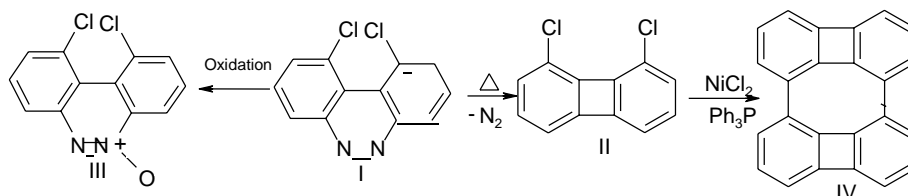
SYNTHESIS OF 1,10-DICHLOROBENZO[C]CINNOLINE, AND ITS N-OXIDE WITH SOME STRAINED MOLECULES RELATED TO BIPHENYLENE

A.Larkem, and H.Larkem

*Department of Chemistry, Faculty of Sciences, University of Annaba,
Annaba 23000, Algeria.*

E-mail: larkem_a@yahoo.fr

The 1, 10- dichlorobenzo[c]cinnoline ,was synthesised in three steps, from the commercially available 1,2- dichloro-3-nitrobenzene, the oxidation of (I) with hydrogen peroxide in acetic acid gave the 1, 10- dichlorobenzo [c] cinnoline –5- oxide (II). Vacuum pyrolysis of the cinnoline (II) at 800 °C, gave pure 1,8- dichlorobiphenylene (III) in high yield, and the latter hydrocarbon (5) is an intermediate molecule in order to synthesise some polycyclic aromatic hydrocarbons related to biphenylene such as cyclo-octatetraene derivative (IV).



Keywords: *Dichlorobenzo[c]cinnoline, dichlorobiphenylene, biphenylene, cyclooctatetraene derivative.*

References:-

- 1- H. Hamada, A. Larkem, and H. Larkem, research Journal of Pharmaceutical, Biological and Chemical Sciences 9(1) **2018**.
- 2- A. Larkem and H. Larkem 3 rd International Conference on Pure and Applied Sciences Feb.02-06, Dubai **2017**.

SYNTHESIS, CHARACTERIZATION AND EMISSION SPECTRA OF SOME SCHIFF BASES AND THEIR TERNARY COMPLEXES WITH RARE EARTH METAL IONS

A. L. El-Ansary^a, N. S. Abdel-Kader^a and T. Youssef^b

^a*Chemistry Department, Faculty of science, Cairo University*

^b*National Institute of Laser Enhanced Sciences, Cairo University, Giza, Egypt*

Schiff bases (Ia and Ib) were prepared by condensation of 6-formyl-7-hydroxy-5-methoxy-2-methylbenzopyran-4-one (I) with 1,4-phenylenediamine (a) and 2-aminopyridine (b). The reaction of these Schiff bases with metal ions (La(III), Nd(III) and Er(III)) in the presence of 8-hydroxyquinoline (8-HQ) produce new ternary complexes. The prepared complexes were characterized on the basis of elemental analyses, ¹H NMR, UV-Vis spectra and IR spectra. The complexes were also characterized by molar conductivities and thermogravimetric analysis (TG). The fluorescence properties of the Schiff bases and their neodymium and erbium complexes in DMF were investigated. The general formulae of the complexes are [M₂.Ia.2(8-HQ).4C₂H₅OH.3OH].NO₃.mH₂O and [M.Ib.(8-HQ).NO₃.n'C₂H₅OH.-nH₂O].mH₂O where M represents the metal ions La(III), Nd(III) and Er(III), n' represent the number of ethanol molecules, n the number of water molecules of coordination and m represent the number of lattice water molecules.

Keywords: Schiff base; Rare earth complexes; 1,4-phenylenediamine, 2-aminopyridine, ternary complexes, benzopyran-4-one

IMPROVEMENT IN SALT CONTENT STANDARD PREPARATION

Salem Ahmed Hzzaz

SAOO-TSD, SALD, Saudi Aramco, KSA

Finding the appropriate prepared standard that will give a stable salt content reading in PTB is the aim of the study. Finding which suitable organic liquid may be used in place of the currently used crude oil as a standard for salt content was conducted. Mineral oil with the addition of dilute salt solution gives a stable salt content reading.

QA/QC samples for salt content (PTB) used by Southern Area Laboratories Division are prepared by adding dilute salt solution to crude oil. The oil itself already contains a certain amount of salt. The crude after the addition of salt solution gives an unstable reading.

The idea is to replace the use of crude oil with a mineral oil. The same addition of dilute salt solution will be followed. By the use of mineral oil instead of crude oil, the PTB readings when tested for salt content gave improved or more consistent results. Mineral oil can replace crude oil for use as standard for salt content. The prepared standard salt solution gives very stable salt content reading.

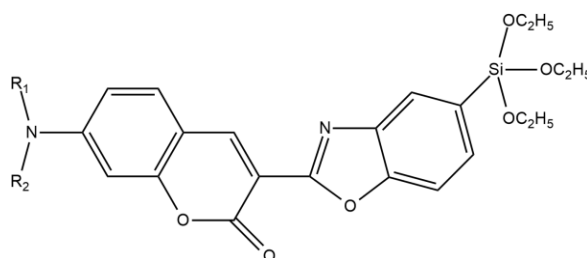
The finding justifies the use of mineral oil as replacement to crude oil in the preparation of standard for salt content.

COMPUTATIONAL INVESTIGATION ON THE ROLE OF THE DIPHENYLAMINO-COUMARIN AS ELECTRON DONOR FOR ORGANIC SILYL-ANCHOR DYES IN DSSCs

O. Al-Ourashi^a

^aUniversity of Jeddah, Chemistry Department, Faculty of Science, Jeddah, Saudi Arabia
e-mail: oaqurshi@uj.edu.sa

The geometrical structures of donor-chromophore-acceptor (D-C-A) sensitizer contain the coumarin as electron-donor moiety and triethoxysilyl as electron-anchor moiety was investigated. Also, photoelectronic properties and energies absorption on TiO₂ surface were determined using density functional theory (DFT) with the standard B3LYP hybrid functional, and the 6-31(d) basis set. In order to develop upon the reference dye ESOC¹ the diethylamino in coumarin was replaced with diphenylamino to give PSOC. This modulation was improve the electron transfer through chromophore spacer. The two dyes were rigid structures due to the presence of fused rings with conjugation. This led to broad absorption spectrum. On the other hand, there is a correspondence between the experimental and calculated absorption wavelengths. The transitions from HOMO to LUMO are easier in PSOC than in ESOC since the energy gaps in the S₀ state of ESOC are larger than those of PSOC. The calculation of the photocurrent and photovoltage for both dyes indicted the performance of PSOC was better than ESOC.



R₁, R₂; CH₂CH₃; **ESOC**

R₁, R₂; C₆H₅; **PSOC**

Figure 1: Chemical structures of ESOC and PSOC

References

1. Kakiage, K.; Aoyama, Y.; Yano, T.; Oya, K.; Kyomen, T.; Hanaya, M. *Chemical Communications* **2015**, 51, (29), 6315-6317.

Acknowledgements: Ohoud Al-Qurashi acknowledges King Abdulaziz University's High-Performance Computing Centre (Aziz Supercomputer) for supporting the computation for calculations described in this work.

OPTIMIZATION OF WATER DESALINATION SYSTEM POWERED BY HIGH CONCENTRATED PHOTOVOLTAIC PANELS IN KUWAIT CLIMATE CONDITIONS

Adel A. Ghoneim

*Public Authority for Applied Education and Training (PAAET),
Applied Sciences Department, College of Technological Studies,
Shuwaikh70654, Kuwait, *Email: aa.ghoniem@paaet.edu.kw*

Desalination using solar energy is an interesting option specifically at regions with abundant solar radiation since such areas normally have scarcity of clean water resources. Desalination is the procedure of eliminating dissolved minerals from seawater or brackish water to generate fresh water. In this work a simulation program is developed to determine the performance of reverse osmosis (RO) waterdesalination plant powered by high concentrated photovoltaic (HCPV) panels in Kuwait climate conditions. The objective of such a photovoltaic thermal system is to accomplish a double output, i.e. co-generation of both electricity and fresh water that is applicable for rural regions with high solar irradiation. The suggested plan enables to design a RO plant that does not depend on costly batteries or additional land and significantly reduce the government costs to subsidize the water generation cost. Typical weather conditions for Kuwait is employed as input to the simulation program. The simulation program is utilized to optimize the system efficiency as well as the distillate water production. The areas and slopes of HCPV modules are varied to attain maximum yearly power production. Maximum yearly distillate production and HCPV energy generation are found to correspond to HCPV facing south with tilt of 27° (Kuwait latitude- 3°). The power needed to produce 1 l of clean drinking water ranged from 2 to 8 kW h/m³, based on the salinity of the feed water and the system operating conditions. Moreover, adapting HCPV systems achieve an avoided greenhouse gases emission by about 1128 ton CO₂ annually. Present outcomes certainly illustrates environmental advantages of water desalination system powered by high concentrated photovoltaic systems in Kuwait climate conditions.

Key words: Desalination, high concentrated photovoltaic systems, reverse osmosis, solar radiation.

HIGHLY EFFICIENT HOLE TRANSPORTING MATERIALS BASED ON ZINC PHTHALOCYANINES FOR PROMISING USE IN PEROVSKITE SOLAR CELLS

Ali A. Husain, Ahmed Abdel Nazeer, Asaithampi Ganesan, Saad Makhseed

Kuwait University, Dr. Ali Husain, Kuwait City, Kuwait.

Kuwait University, Dr. Ahmed Nazeer, Kuwait City, Kuwait.

Kuwait University, Dr. Asaithampi Ganesan, Kuwait City, Kuwait.

Kuwait University, Prof. Saad Makhseed, Kuwait City, Kuwait.

e-mail: ahusain10@hotmail.com

Perovskite solar cells (PSCs) are considered as promising low-cost photovoltaic devices that show excellent power conversion efficiency (PCE) of solar-to-electric. In this regard, two zinc metalated phthalocyanine derivatives (Pc1 & Pc2) were synthesized and applied as hole transporting material (HTM) in PSCs. The optimized devices using Pc1 and Pc2 as HTM, deliver a power conversion efficiency of 7.64% and 9.5% at AM 1.5 simulated sun light, respectively. Mixing Pc1 with spiro-OMeTAD resulted in a remarkable increase in the cell efficiency (15.64%) compared with 12.55% obtained in case of spiro-OMeTAD alone at the same conditions. These results will pave the way for fabricating highly efficient PSCs with low cost and high open-circuit voltage and fill factor.

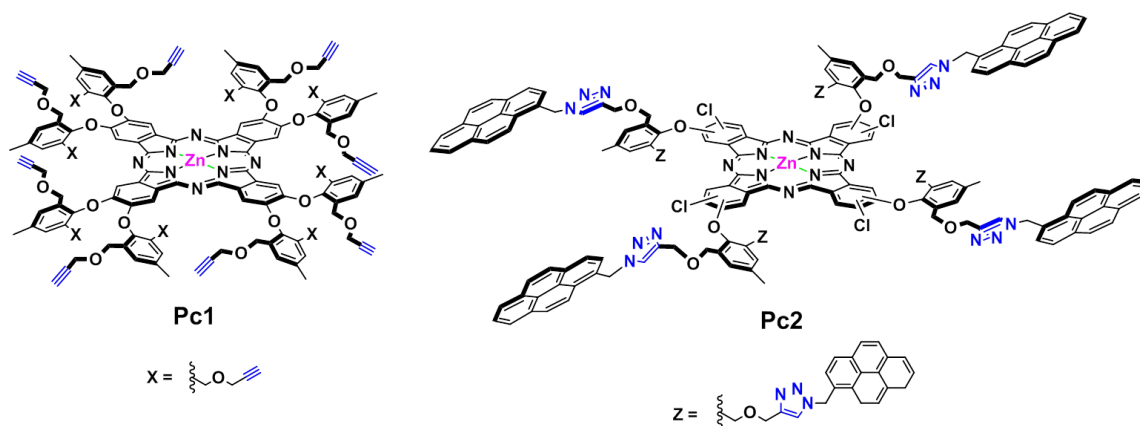


Figure 1. Structures of Pc1 and Pc2 .

References (10 pt)

1. Yusoff, A. R.; Nazeeruddin, M. K. *J. Phys. Chem. Lett.* **2016**, *7*, 851-866.
2. Wang, D.; Wright, M.; Elumali, N.; Uddin, A. *Sol. Cells*, **2016**, *147*, 255-275.

Acknowledgements: This work was funded by Advancement of Science-KFAS (grant no. P11514SC05) and Kuwait University Research administration; RSP unit general facilities of the Faculty of Science GFS (GS 01/01, GS 02/01, GS 03/01, GS 01/03, GS 01/05, GS 02/13).

QUEST FOR PEROVSKITE SOLAR CELLS APPLICATION BASED ON PHTHALOCYANINE

Ahmed Abdel Nazeer, Basma Ghazal, Shereen A. Majid, Saad Makhseed*

Chemistry department, Kuwait University, Kuwait
Email: saad.makhseed@ku.edu.kw

Two phthalocyaninato zinc(II) derivatives bearing different carbazole moieties (**1** and **2**) were studied as new hole transporting materials (HTM) for perovskite solar cells (PSCs). Cyclic voltammetric analyses confirm their excellent electrochemical stability and their required energy levels were properly located within the perovskite layer position for efficient charge transfer. Excellent power conversion efficiencies (PCE) of 5.65% and 5.58% under AM1.5 G standard were achieved for **1** and **2**, respectively. The obtained results confirmed the ability of using these compounds in PSCs devices.

STRUCTURE TAILORING OF PtPd NANODENDRITES SENSITIZED NIOBIUM OXYNITRIDE FOR PHOTOELECTROCHEMICAL HYDROGEN EVOLUTION

Yahia H. Ahmad, Kamel Eid, and Siham Y. AlOaradawi*

Department of Chemistry and Earth Sciences, College of Arts and Sciences, Qatar University, Doha 2713, Qatar.

E-mail: siham@qu.edu.qa

Herein, we present synthesis of PtPd nanodendrites (NDs) sensitized niobium oxynitride nanosheets (PtPd-NbON) for solar-driven H₂ production. This was achieved by annealing Nb₂O₅ under NH₃ and subsequent use of the oxynitride as starting seed for simultaneous growth and self-assembly of PtPd NDs with the assistance of Pluronic F127. The produced PtPd NDs were assembled by multiple branches and were well distributed over the surface of NbON nanosheets. The photocatalytic hydrogen evolution performance of PtPd-NbON was substantially superior to NbON and Nb₂O₅, ascribing to its great visible-light-harvesting properties, narrow bandgap, and the unique catalytic merits of PtPd NDs. The N- dopant can be easily tuned by adjusting the annealing time under NH₃. Both the N- dopant and PtPd NDs led to narrowing the bandgap energies of Nb₂O₅ and improving its visible light absorption along with the photocatalytic performance. The photocatalytic activity of PtPd/NbON was about 11 and 114 times greater than NbON and Nb₂O₅, respectively towards HER activity.

References J. Zhang, L. Qu, G. Shi, J. Liu, J. Chen and L. Dai, *Angew. Chem.*, 2016, 128, 2270-2274. T. Zhang, K. Zhao, J. Yu, J. Jin, Y. Qi, H. Li, X. Hou and G. Liu, *Nanoscale*, 2013, 5, 8375-8383. H. Huang, C. Wang, J. Huang, X. Wang, Y. Du and P. Yang, *Nanoscale*, 2014, 6, 7274-7280.

Acknowledgments This work was made possible by NPRP Grant no. NPRP 7-485-1-091 from the Qatar National Research Fund (a member of Qatar Foundation). The statements made herein are solely the Responsibility of the authors.

Shape-Dependent Electrocatalytic Activity of Gold Nanoparticles towards the Oxidation of Glucose

K. A. Soliman^a, A. F. Zedan^{a,b}, S. Y. AlQaradawi^a, N. K. Allam^c, A. S. AlJaber^a

^a*Department of Chemistry and Earth Sciences, Qatar University, Doha 2713, Qatar.*

^b*National Institute of Laser Enhanced Science, Cairo University, Giza 12613, Egypt.*

^c*Energy Materials Lab., The American University in Cairo, Cairo 11835, Egypt.*

e-mail: a.s.aljaber@qu.edu.qa

The design of gold nanoparticles with tailored size, shape and crystalline facets has received a great attention due to their excellent electrocatalytic activity towards glucose electrooxidation reaction. The electrocatalytic oxidation of glucose is important in various applications including blood sugar sensing, fuel cells and wastewater treatment. Here we demonstrate the shape-dependent electrocatalytic activity of gold nanoparticles toward glucose oxidation in alkaline medium. The synthesis of gold nanospheres was based on the citrate-reduction method and the synthesis of the different shaped-gold nanoparticles (nanorods and nanocubes) was achieved by varying the concentration of the silver ions under seed-mediated growth. The surface modification of the glassy carbon electrodes with the gold nanoparticles was achieved using the gold sol and without any binding agent. The cyclic voltammetric measurements of the electrocatalytic oxidation of glucose over gold-modified glassy carbon electrodes was carried out using 10 mM glucose in 0.1 M KOH at 50 mV s⁻¹. The results revealed that variation of the shape of the gold nanoparticles influenced the electrocatalytic oxidation of glucose by affecting both the glucose oxidation peak potential and the current density. Among the different-shaped gold nanoparticles, gold nanorods exhibited an enhanced current density over gold nanocubes and nanospheres

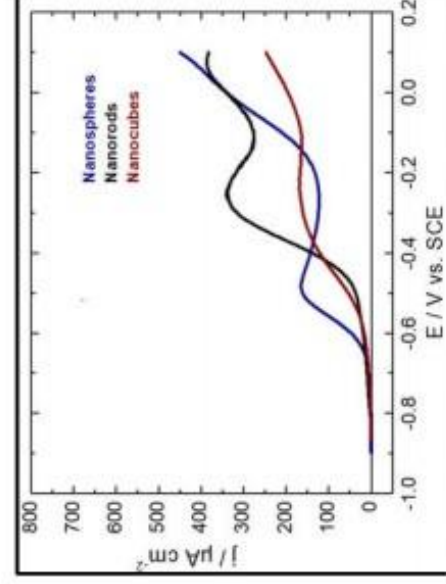


Figure 1. Cyclic voltammograms of electrocatalytic glucose oxidation over different gold-modified glassy carbon electrodes

Acknowledgements: This work was funded by Qatar University.

OPTIMIZATION SAMPLE PREPARATION FOR ELEMENTAL ANALYSIS

Tahani Al-Shamary, Hassan Al-Rabiah*

Petroleum Research Center, Kuwait Institute for Scientific Research

*E-mail: Hrabiah@kisir.edu.kw

Petroleum products can cause a destructive impact on the environment, a vast amount of pollutants are emitted into the atmosphere from using petroleum products. The petroleum industry faces many challenges for treating petroleum products to be more environmentally friendly. Many of the refinery processes aim to control the amount of pollutants in their products to minimize harmful emission of toxic gases. The refineries require analytical methodologies to monitor the pollutants concentrations in their products. One of the most important tests that are widely used in the refinery are the elemental analysis. The tests are used to monitor the impurities in the samples such as sulfur, nitrogen, carbon, and metals. Inductive Coupled Plasma (ICP), Wavelength Dispersive X-ray (XRD), Sulfur and Nitrogen Chemiluminescence are widely used techniques for petroleum products analysis. Sample preparation could play great rule in the accuracy of the reported results. Solid, liquid, and gas samples need deferent ways of handling. Due to the importance of the elemental analysis the petroleum products processability, this paper focuses on the optimizing the sample preparation to improve the results reliability. Such information is very important for refinery processes and should contribute to optimize the processing of crude oils.

OPTIMIZATION OF HPLC TECHNIQUE FOR THE IDENTIFICATION OF AROMATIC GROUPS IN KUWAIT MIDDLE DISTILLATES

Rashed Bouresli, A. Al-Hendi, and R. Kadhmi

*Petroleum Research Center
Kuwait Institute for Scientific Research
P.O. Box 24885
Safat 13109, Kuwait
Email: rbouresli@kisir.edu.kw*

There are many analytical methods used to quantify the aromatic hydrocarbons (AH) in middle distillates, even though, enhancement of those methods need to be carried out for every sample type. High performance Liquid chromatography is one of the most used techniques for analyzing AH in petroleum products, but different fractions have different nature, so enhancement to the original methods was carried out to get better analysis. Evaluation of refractive index response, column resolution, and mobile-phase back-flush to aromatic compounds was assessed. Aromatic type distribution in kerosene varied from Lower Fars > Eocene > KHC > KEC. The gas oils aromatic type distribution in the order Lower Fars > Eocene > KEC > KHC. Sulfur distribution in kerosene is of Di-Aromatic-sulfur-hydrocarbons (DASH) mainly with more than 58-83%. The composition in gas oils is 80-100% DASHs, and 1-7% Tri- aromatic sulfur hydrocarbons.

Keywords: Aromatics, HPLC, gasoil, kerosene, hydrocarbon, sulfur.

RECYCLING OF WASTE ALUMINA AND CATALYST FINES PRODUCED IN THE CATALYST MANUFACTURING UNIT

K. Al-Dalama, R. Navvamani and H. Al-Sheeha

Kuwait Institute for scientific research

During catalyst manufacturing a lot of fines are produced as byproducts. These fines consist of alumina and catalyst powder and contain heavy metals such as Mo, Co and Ni which are environmentally hazardous. Recycling of these fines which is discarded as wastes will be beneficial from both environmental and economic points of view and intensive efforts have been made in utilization of the waste catalyst materials as much as possible [1, 2]. In the present study, research was directed to investigate the possibility of utilization of alumina and hydrotreating catalyst fines produced at Kuwait Catalyst Company (KCC) in the preparation of catalyst extrudates with properties similar to active fresh hydrotreating catalysts currently produced in KCC.

To achieve these objectives three series of catalysts NiMo were prepared using fresh alumina (boehmite) powder and three types of waste alumina powder materials (WA, WB, WC) shown in Table 1. A kneader and extruder manufactured by Werner and Pfliederer were used to prepare alumina extrudates. The alumina extrudates prepared in these studies with different percentages of waste alumina powder and fresh boehmite powder were characterized and used for the preparation of Ni-Mo/Al₂O₃ hydrotreating catalysts similar to catalysts commercially produced by (KCC). The prepared catalysts were characterized and their hydrotreating activity tests were conducted in a bench scale reactor unit using Kuwait atmospheric residue as feed.

The following are the important results and conclusion of the studies:

- Reprocessing of waste alumina fines generated at KCC's plant to prepare alumina support extrudates by mixing and extrusion with boehmite was possible.
- Alumina support extrudates with reasonably high surface areas (>180m²/g), pore volume (> 0.6ml/g) and side crushing strength (> 3.lb/mm) were prepared by mixing up to 50wt% of the waste alumina fines with the original boehmite raw materials.
- The alumina extrudates prepared using the waste alumina fines had slightly larger pore volume and wider mean pore diameter than that prepared without the addition of fines.
- Hydrotreating activities of NiMo type catalysts prepared from the supports extruded from waste alumina fines and boehmite mix were better than that of corresponding commercial catalysts (Fig.1).
- Highest HDS activity was observed for the catalyst prepared by mixing 10 wt% of the alumina waste material (W.C) compared to that of a reference commercial NiMo type HDS catalyst prepared by KCC (Fig. 1).

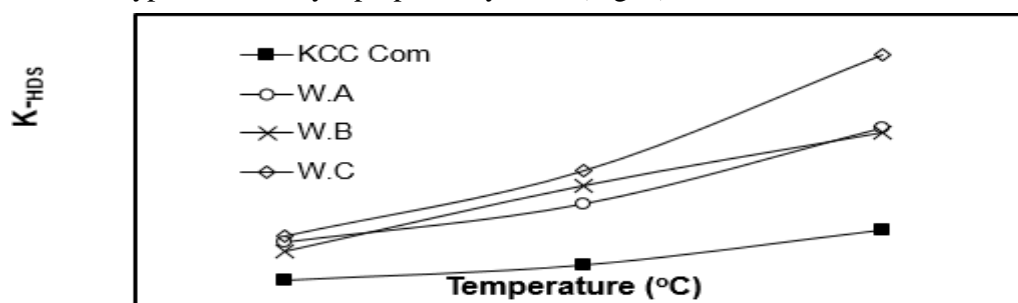


Fig. 1. Comparison of HDS activity of commercial KCC catalyst and prepared catalysts containing 10% of waste alumina

HYDROISOMERIZATION/HYDROCRACKING OF N-HEXANE AND N-HEPTANE ON THE BIFUNCTIONAL SITES GENERATED IN-SITU ON THE WO₃/TiO₂ SURFACE

A. M. Mohamed^{a*}, M. A. Hasan^a, H. Al-Kandari^b

a. Chemistry Department, Kuwait University, P.O. Box 5969 Safat, 13060, Kuwait

b. College of Health Sciences, PAAET, P.O. 1428, Faiha, Kuwait

E-mail: ahmed.mohamed@ku.edu.kw

Tungsten trioxide (WO₃) supported on titanium dioxide (TiO₂) catalyst composite (WTi) was prepared via an environmental friendly wet impregnation method. This catalyst was investigated by in-situ XPS-UPS and ex-situ BET and XRD characterization techniques. Activation of WTi composite by hydrogen at 623 K resulted in partial reduction of WO₃ to WO_{3-x} with reduction degree 47.5%, the degree of reduction increases to 64.0% at 673 K without any change in the structure of TiO₂. The activation processes generate metallic sites (M) on the surface of the catalyst composite as observed in the XPS-UPS valence band region. On the other hand, XPS curve fitting of O1s region shows peak at 530.4eV which is related to oxide oxygen and one more peak at 531.2 eV to the Brønsted –OH acidic sites (A). The intensities and atomic percentage of Brønsted acidic sites and metallic sites were increased as the activation temperature increased. In order to simulate the industrial process, the catalytic activity was evaluated for the hydroisomerization/hydrocracking of n-hexane and n-heptane using 15 cm³ WTi in a large-scale reactor at different experimental parameters. At a reaction temperature of 598 K, the catalytic activity was 97.1% in the case of n-heptane in favor of β-scission (C3-iC4, 78.4%), compared to 76.1% activity in favor of the isomerization products (84.6%) in the case of n-hexane after the composite activation at 673 K. The research octane number (RON) was improved from 24.8 for n-hexane to the 70–80 range for hexane isomers and from zero in the case of n-heptane to cracking products with a high octane number.

Table: Effect of activation/reaction temperature on the catalytic activity of activated 15 cm³ (16.5 g) WTi for 14 h at 623 K and 673 K, hydrogen flow 30 SLPH at 15 bar. * After reduction at this

| Temperature (K) | 623* | 598 | 673* | 623 | 598 | 573 |
|-----------------------------|------|------|-------|------|------|------|
| Conversion, % | 84.1 | 50.4 | 96.8 | 85.1 | 76.1 | 61.2 |
| Isomerization (iC6), % | 29.1 | 62.9 | 3.7 | 58.9 | 84.6 | 88.4 |
| β-Scission cracking (C3), % | 44.5 | 25.8 | 29.5 | 14.4 | 5.0 | 3.8 |
| Hydrogenolysis cracking, % | 26.4 | 11.3 | 66.7 | 26.7 | 10.3 | 7.8 |
| RON of products | 85.3 | 57.1 | 102.3 | 79.6 | 68.9 | 59.5 |

temperature for 14 h.

References

- [1] N. Parsafard, M.H. Peyrovi, M. Jarayedi, Catalytic Study and Kinetic Modeling of the n-Heptane Isomerization over Pt/Al-HMS/HZSM-5 Hybrid Catalysts, *Energy Fuels*, 31 (2017) 6389-6396.
- [2] M. Khurshid, M.A. Al-Daous, H. Hattori, S.S. Al-Khattaf, Effects of hydrogen on heptane isomerization over zirconium oxide modified with tungsten oxide and platinum, *Appl. Catal., A*, 362 (2009) 75-81.
- [3] G.J. Antos, A.M. Aitani, *Catalytic Naphtha Reforming, Revised and Expanded*, Taylor & Francis 2004.

Acknowledgements The authors gratefully acknowledge the College of Graduate Studies of Kuwait University for their support of this research work.

DETERMINATION OF ACID SITES OF DEALUMINATED ZEOLITE BY USING ISOPROPANOL AS PROBE MOLECULE

H. Al-Sheeha^a, R. Navvamani^b

*Petroleum Research Center, Kuwait Institute for scientific Research, P O Box: 24885 Safat 13109, Ahmadi, Kuwait,
e-mail: hjassim@kisir.edu.kw*

Hydrotreating is one of the essential refining processes that play a crucial role in whole petroleum refining industry. Zeolites are a type of solid porous material has turned into an important for catalytic processing, either in the cracking of large molecules to lighter hydrocarbon or the production of clean fuel in the presence of hydrogen¹. Zeolites are the most flexible solid catalyst that can be easily modified with the desired acid-base properties. Zeolite delamination is one of the most useful and widely used modifications to enhance textural properties and to obtained desire Si/Al ratio. Zeolite was dealuminated by acid treatment and steam dealumination with a variation of leaching agent and temperature, respectively. The zeolite surface was also enriched by using the ion-exchange method. The acid-base site analysis was carried out by using isopropanol as a probe molecule for catalytic reaction, which product selectivity is a quantitative analysis of the surface. Isopropanol usually gives selective catalytic reaction based on the type of the catalytic site available on a catalyst. The stronger acidic function will be more selective towards the formation of propylene, while the basic function of catalysts and supports will be more selective towards the formation of acetone. Thus, it is essential to establish a quantification of acid-base catalytic sites. Ion exchange with 10% NH_4NO_3 was found to be an effective method for replacing Na^+ with NH^+ . Acid treatment yielded little changes in the textural properties of the zeolite materials. All the experimental techniques that have been used to probe acid sites in zeolites have essential contributions toward the elaboration of a clear picture of the active sites in zeolites². The ion-exchanged zeolite losses its crystalline structure and change to amorphous materials when treated with steam above 100°C. In IPA conversion reaction the percentage of conversion decreases with increase in steam temperature and retains its conversion at a highertemperature.

References (10 pt)

1. Degnan Jr, T. F. *Topics in Catal.* **2000**, 13(4), 349-356.
2. Silaghi, M. C., C. Chizallet, P. Raybaud. *Microporous and Mesoporous Mater.* **2014**, 191, 82-96.

Acknowledgements: This work was funded by KISR.

REDUCING SAFETY RISK BY ELIMINATION BACTERIA ISSUE IN OIL PRODUCTION FACILITIES

Salman Ahmad Al-Oabandi,

Kuwait Oil Company (KOC)

SQABAND@kockw.com

The presence of bacteria in wash water causes such as; high H₂S (sour system) by Sulfate Reducing Bacteria (SRB) type, corrosion (filters, equipment & pipelines), iron sulfide (blockage of filters & equipment) and reservoir souring. Once wash water is get mixed with formation water (associated water with crude) and crude, then bacteria get activated and starts to reproduce, where the simple organic acids and molecular hydrogen from decomposing natural organic matter that present in formation water are the main nutrients for SRB, then SRB starts to produce H₂S and as a result, the liquid media changes to be acidic media. Then, the sour effluent water is separated from crude oil and is transferred to effluent water pumping plant (effluent water pumped into reservoir to maintain reservoir pressure), where during this process, H₂S mixes with iron (partially produced from MIC bacteria (Microbiologically-Influenced Corrosion) and corrosion) presents in effluent water to produce iron sulfide (FeS), which causing blockage of filters and equipment in the plant. Also, the pumped sour effluent water in the reservoir causes reservoir souring. On the other hand, the presence of MIC in wash water causes corrosion in de-salter at the Gathering Centers (GCs). This study demonstrate a new applied bacteria treatment regimen and the reduction of bacteria trend.

Key word: Sulfate reducing bacteria, Iron sulfide, media, corrosion, bacteria control

LOW DOSAGE HYDRATE INHIBITOR IMPLEMENTATION IN NORTH KUWAIT JURASSIC FIELDS

Khalid Al-Otaibi

Kuwait Oil Company. E-mail: kmotaibi@kockw.com

Gas hydrate are ice-like clathrate solids that are formed from water and small hydrocarbons at elevated pressures and lower temperatures. The temperature that hydrates can form increases with increasing pressure and can be as high as 30 °C.

Pipeline Hydrate formation is one of the biggest operational challenge in the North Kuwait Jurassic (NKJ) fields, which frequently disrupts the production of some of the high producing gas wells during the winter months. As soon as the ambient temperature starts to go down below 20 °C, the gas wells starts to form hydrate and causing well shutdown.

Chemical treatment to prevent hydrate was accomplished using anti-agglomerate and kinetic hydrate inhibitor which led to indirect cost saving for logistic and operational sides.

Key word: Hydrocarbon, Gas hydrate, anti-agglomerate

STUDY THE EFFECT OF ACCELERATION BOILING DEGREE ON THE QUALITY OF ENGINE FUELS

Ali A. Ali Al yasiri¹, R. Z. Magaril², M. S. Rogalev³

¹*ThiQar university college of science chemistry department, Iraq*

²*Tyumen State Oil and Gas University, Russia*

³*LLC TyumenNIIgiprogas, OJSC "Gazprom", Russia*

The rectification process is one of the important processes for fractionating mixtures of soluble components into pure compounds. This process is widely used in chemical, petrochemical, refinery, pharmaceutical and also in food industries. In this work, the best concentration value of synthesis surfactant was injected in a feed stream of the rectification column. It had been noted that the boiling rate of the remaining light fractions in the bottom part of the fractionating tower was doubled. This led to decrease the residue compounds in bottom part of the fractionating tower and increase the quality of the prior fraction. The results of this work can be applied in the operation of fractionating towers for many purposes.

MOLECULAR STRUCTURAL DETERMINATION OF HEAVY AND LIGHT CRUDE OIL ASPHALTENES BY INFRARED, RAMAN, TWO-DIMENSIONAL NMR SPECTROSCOPY, AND MOLECULAR DYNAMICS SIMULATIONS

Salim Ok^{a,*}, Navvamani Rajasekaran^a, Raffaella Cabriolu^b, Titus van Erp^b

^a*Petroleum Research Center, Kuwait Institute for Scientific Research, P.O. box 24885 Safat, 13109, Kuwait*

^b*Department of Chemistry, Norwegian University of Science and Technology (NTNU)
Høgskoleringen 5, Realfagbygget D3-117, 7491 Trondheim, Norway
email: saok@kisir.edu.kw*

Due to complexity in the chemical structure of asphaltenes, identification and characterization of asphaltenes remain a big challenge for researchers in oil industry. In the current contribution, attenuated total reflection Fourier Transform Infrared (ATR-FTIR), besides Raman spectroscopy and nuclear magnetic resonance (NMR) spectroscopy are applied for characterizing various properties and parameters of asphaltenes obtained from either heavy or light crude oil samples. ATR-FTIR revealed clarified the existence of different functional groups of asphaltene samples. Average molecular sizes of condensed polyaromatic cores of asphaltene samples are determined from the integrated intensities of graphitic bands in the Raman spectra of asphaltenes. NMR spectroscopy applied in solution helped with the clarification of the chemical structures of asphaltene samples even down to 'bay' and 'fjord' type structures. Based on the NMR correlations, various chemical structures (polyaromatic cores with aliphatic chains, porphyrin derivatives, organic salts) are proposed. Experimental results indicate a higher average molecular size and more complicated chemical structure for the light crude oil asphaltenes than the heavy crude oil ones. Clarification of such chemical structures gives the chance of gaining insight into why asphaltene aggregation and precipitation occur in particular when the fraction of asphaltene is closer to 1 wt% as in the case of light crude oils. Interactions between asphaltenes are clarified by simulations as well.

Acknowledgment: This project is supported by internal funding of Kuwait Institute for Scientific Research (KISR).

GROUP TYPE ANALYSIS OF VACUUM RESIDUE USING TLC-FID AND OPEN COLUMN CHROMATOGRAPHY.

Latifa Al-Ostad, Hassan Al-Rabiah, Hisham Al-Henayyan

Petroleum Research Center, Kuwait Institute for Scientific Research

E-mail: Hrabiah@kisir.edu.kw

Petroleum is a significant source of energy, which effects economy, politics, and technology. Crude oil composition can affect the performance of processes in both down-stream and up-stream. Petroleum consists of a complex mixture of hydrocarbons of numerous compounds of deferent molecular weights and polarities. The hydrocarbons in petroleum are mostly paraffins, naphthenes, and aromatics along with other heteroatomic compounds. Crude oil characterization is challenging due to the complexity of its mixture. Therefore, it is essential to separate the crude compounds into four different fractions based on their polarities into Saturates, Aromatics, Resins, and Asphaltenes (SARA). Separating the crude into four fractions help in the understanding of the crude characteristics. Petroleum industry relay on SARA analysis to evaluate and understand heavy petroleum products. SARA analysis is currently using an open column chromatography assisted by gravity to fractionate the SARA components. This method has some drawbacks, it is time-consuming, and needs a significant amount of solvent and stationary phase material. This paper demonstrates a comparative study of the efficiency of the current method and proposed methodology that employs a thin layer chromatography paired with flame ionization detector technique. The study covered using the two methods to analyze four different Kuwaiti atmospheric residues.

DILUTION EFFECT OF HEAVIER ATMOSPHERIC RESIDUES ON THEIR HYDROPROCESSING

Ahmad Al-Otaibi and Adel Al-Mutairi

Petroleum Research Center, Kuwait Institute for Scientific Research (KISR), P.O. Box 24885, 13109-Safat-Kuwait. Omtaibi@kISR.edu.kw

As conventional crude oils supply decline, world dependence on heavy crude oil reserves is increasing. Heavy crudes contains large amount of contaminants such as sulfur, nitrogen, metals and asphaltene etc. Hence, refineries need to develop further the technologies of processing heavy feedstocks to produce the desired products with less environmentally impact. Mixing Atmospheric residues (AR's) from such heavy oils with lighter one would be a solution to process them. A good knowledge about the performances and behaviors of these mixtures is very important. In this study, Two AR's were used namely, heavy atmospheric residue (H-AR) and light atmospheric residue (L-AR), where H-AR is the heavier one in comparison with L-AR. The effect of diluting H-AR by L-AR on its hydroprocessing performance was examined. The results presented showed that there were differences in their performance and reactivity after H-AR dilution by L-AR, which considers a big challenge to study the chemistry of dilution of Atmospheric residues distilled heavy oils.

POLY(VINYLLIDENE FLUORIDE) BASED POROUS MEMBRANES CONTAINING IONIC LIQUID

A. Al-Banna, S. Al-Enezi* & J. Samuel

*Petroleum Research Center, Ahmadi
Kuwait Institute for Scientific Research
senezi@kISR.edu.kw*

Polymer based membranes are one of the low-cost technologies available for the gas separation. Three major elements required for a commercial gas separating membrane are high permeability, high selectivity, and good mechanical strength. Polyvinylidene fluoride (PVDF) is a commercially available fluoropolymer and a widely used membrane material in gas separation devices since it possesses remarkable thermal, chemical stability, and excellent mechanical strength. The PVDF membrane was chemically modified by ionic liquid and the compositional features were identified by FTIR analysis. The thermal behavior of modified membranes was investigated by differential scanning calorimetry (DSC) and the results clearly show the best affinity between the ionic liquid and the polymer support. The porous structure of the PVDF membranes was clearly seen in the scanning electron microscopy (SEM) images.

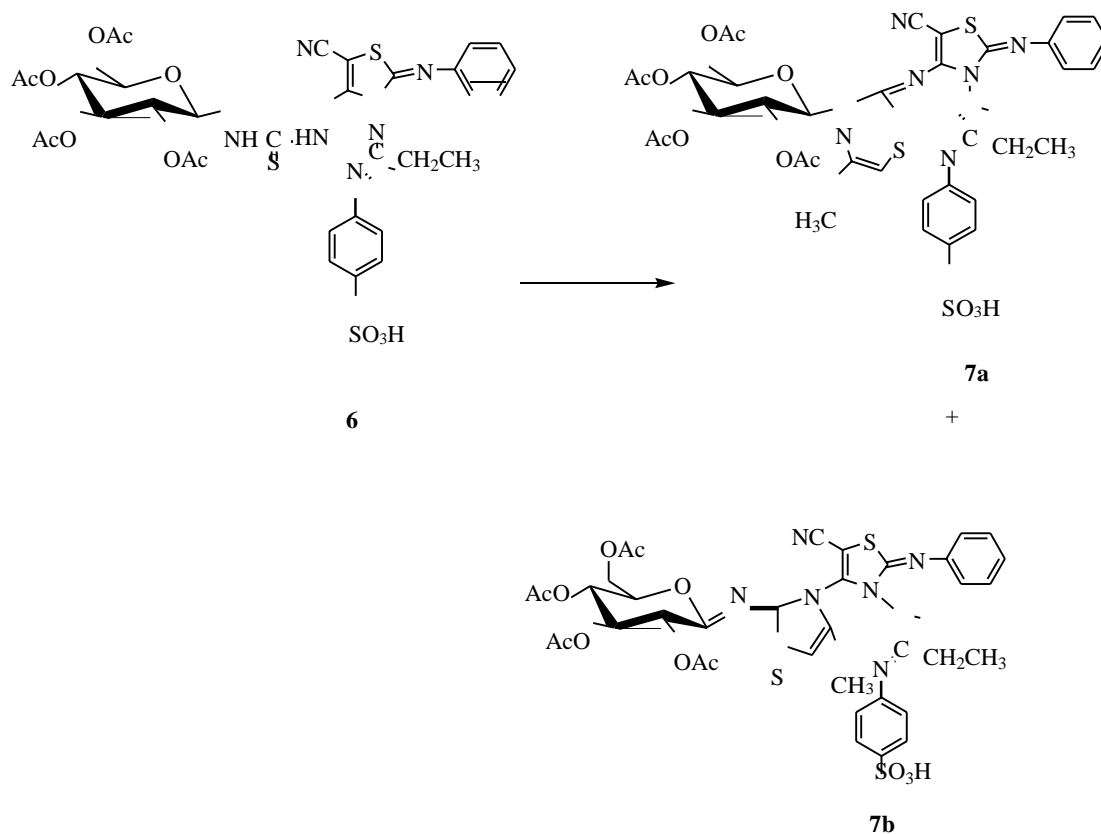
SYNTHESIS AND ANTIMICROBIAL EVALUATION OF NEW THIAZOLE NUCLEOSIDES UNDER GREEN CHEMISTRY

Amira A. Ghoneim^{1,2}

¹Chemistry Department, College of Science, Al-Jouf University, Sakaka, Kingdom of Saudi Arabia.
Tel.: 00966541609390.

²Chemistry Department, Faculty of Science, Zagazig University, Zagazig, Egypt;
Address correspondence to this author at E-mail*: aa_amiraatef@yahoo.com

We synthesized a novel series of *N*-(2,3,4,6,-tetra-*O*-acetyl- β -D-glucopyranosyl)-*N'*-(4-amino-5-cyano-2-(phenylimino) thiazol derivatives, in a short reaction time and gave excellent yields when compared with conventional heating methods. The deacetylation of acetyl group of the synthesized compounds gave *N*-(β -D-glucopyranoside)-*N'*-(4-amino-5-cyano-2-(phenylimino) thiazol derivatives. The prepared compounds were screened for antibacterial properties against *Staphylococcus aureus*, *Escherichia coli*, and antifungal activity against *Candida sp.*, *Aspergillus multi* and *Aspergillus niger*. The structure of newly compounds were detected by ¹H-NMR, IR and elemental analysis.



EVALUATION OF NEW BIOCIDES DETERMINATION METHODS AT SEA WATER TREATMENT PLANT

Osamah K. Alshurafa

Saudi Aramco- Southern area laboratories Division, KSA

Saudi Aramco is one of the largest Oil & Gas companies in the world. So, In order to increase the efficiency of oil production. Saudi Aramco treats and injects sea water to maintain the pressure in reservoirs. The sea water source is the Arabian Gulf which is located in the eastern region of Saudi Arabia. The seawater network is about 1,900 KM in length. In order to assure the integrity of this network, the piping must be protected from corrosion. So, biocide is being injected at Qurayyah Sea Water Plant (QSWP) to protect the network from microbial growth. Previously, the biocide was injected at QSWP with a formaldehyde base biocide. This have been evaluated by the Environmental protection team and founded toxic to most of the marine life when it is discharged to Arabian Gulf. So, in order to comply with the environmental regulations, it is required to change the type of biocide to be free of formaldehyde which will result in changing the residual determination methods. Along with chemicals, vendor companies provided biocide residual determination procedures. However, those procedures were not convenient due to the laborious procedures and lengthy analysis time. So, our laboratory have developed a new and convenient method for the analysis of biocide residuals which was evaluated by Research and Development center in Saudi Aramco and accepted by the biocide vendor. The new method was found to achieve the analysis in much shorter time with less sample preparation.

DETERMINATION THE ACCUMULATION OF TRACE ELEMENT IN THE SOIL, WATER AND PLANTS IN FARM FROM JEDDAH CITY

Shroog A. Al-Ansari^a, Basma G. Alhogabi^b

^a*Department of Chemistry, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia*

^b*Department of Chemistry, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia*

e-mail: Shroog.alansari@gmail.com

Trace element are found in nature and their measurement in environment are necessary to develop health management strategies. This work investigates the concentration of trace element (chromium, copper, nickel, lead, iron, and zinc) in the soil, irrigation water, and edible vegetables on a selected farm nearby the city of Jeddah, Saudi Arabia from May to October 2016. Samples were taken from soil and water, totally 11, and 4 vegetable samples were collected which is coriander (*Coriandrum sativum*), dill (*Anethum graveolens*), parsley (*Petroselinum crispum*) and arugula (*Eruca sativa*). The acid digestion was applied for digesting the samples and the concentrations of trace element were determined by inductively coupled plasma optical emission spectrometry (ICP-OM). The spatial surfaces of trace element were created using geospatial information system. The order of trace element in soil were $Fe > Cr > Zn > Pb > Ni > Cu$, while in water were $Pb > Fe > Cu > Zn > Ni = Cr$. Moreover, the order of trace element in vegetables was $Fe > Zn > Cu > Cr > Ni > Pb$. The concentrations of Fe mg/kg, Cr mg/kg and Pb mg/kg in the soil were more than the maximum allowable limits of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). In summary, the concentrations of trace element in water and vegetables samples were below FAO and the WHO standards, however, the soil was still contaminated by Fe, Cr and Pb.

Keywords: Trace element; Soil; Water; Plant; inductively coupled plasma optical emission spectrometry;

Acknowledgements: The author acknowledges the Department of Chemistry, King Abdulaziz University, Jeddah, Saudi Arabia for supporting this research work.

ATMOSPHERIC OXIDATION OF METHYL PROPANOATE BY THE OH RADICAL

Mohamed A. M. Mahmoud,¹ Safinaz H. El-Demerdash ¹ Tarek M. EL Gogary,^{2,3,*} Ahmed M. El-Nahas^{1,*}

¹Chemistry Department, Faculty of Science, Menoufia University, 32512 Shebin El-kom, Egypt.

²Chemistry Department, Faculty of Science, Jazan University, 2097 Jazan, KSA.

³School of Allied Health Sciences, Faculty of Health & Life Sciences, De Montfort University, Leicester, UK.

Atmospheric oxidation of methyl propanoate (MP) by the OH radical has been performed using density functional theory (BMK, BBIK) and ab initio (MP2, CBS-QB3) calculations. The thermodynamic and kinetic parameters are calculated. Three channels have been discussed. These reactions occur through low energy barriers of 3.2–4.3 kcal/mol. The energy barriers increase in the order $\alpha < \mu < \beta$ at CBS-QB3. However, BMK shows slightly different order. Rate constants and branching ratios reveal that the H-abstraction from C _{α} is as the dominant reaction over the whole temperature range of 100–300 K, with a competition from C _{β} channel at lower temperature. The BBIK data reproduce the available experimental rate constant.

Keywords: Methyl propanoate, atmospheric oxidation, DFT, ab initio, rate constants.

SMART GREEN CHEMISTRY SYNTHESIS OF MICROPOROUS MATERIAL BY FLOW INJECTION METHOD FOR CO₂ CAPTURE

Fadi Ibrahim*

**Department of Chemistry, Saad bin-alrabee alansari School Kuwait*

Carbon dioxide is thought to be one of the contributing factors in the rise of global warming. Consequently the discovery for an efficient and economically valuable gas capturing system is highly in demand. Therefore there have been various recent developments in creating new, efficient and adaptable gas capturing materials. Microporous organic based materials received great research efforts in the field of environmental related applications such as gas storage and separations due to their permanent porosity, low density (i.e. composed of light weight elements) and remarkable physicochemical stability. Three anthracene microporous polymers (AMPs)^{1,2} bridged by imide links were successfully prepared by conventional nucleophilic substitution reaction between different 9,10-dihydro-9,10-ethanoanthracenes and 2,3,5,6-tetrachlorophalonitrile (instead of fluoro-monomer)². AMPs display a BET surface area in the range of 711-796 m² g⁻¹, and adsorb reach to 1.70 wt. % H₂ at 1.09 bar/77 K. The enhanced microporosity, in comparison to other organic microporous polymers originates from the macromolecular shape of framework, as dictated by the anthracene units, which helps to reduce intermolecular contact between the extended planar struts of the rigid framework. The impressive hydrogen adsorption capture of these materials verified by Horvath–Kawazoe (HK) and NLDFT analyses of low-pressure nitrogen adsorption data, which expected to be use in transportation as a source of green chemistry. A novel synthesis method for AMPs was done by Flow Injection System (FIS). This method has the advantage over conventional synthesis method as saving time-solvent and lowering synthesis cost of. Optimizing conditions (sample & reagent volumes, 0.1 ml/min flow rate, with 0.5 m coil length and 0.5 mm i.d) were used for increasing percentage yield of the product.

References

- 1- Saad Makhseed and Jacob Samuel J. Mater. Chem. A, 2013,1, 13004-13010
- 2- Fadi Ibrahim. Elixir Nanocomposite Materials, 62, 2013,17542-17548.
- 3- J.-L. Li and B.-H. Chen, "Review of CO₂ Absorption Using Chemical Solvents in Hollow Fiber Membrane Contactors," Separation and Purification Technology, Vol. 41, No. 2, 2005, pp. 109-122.

REMOVAL OF BISMUTH (III) AND MANGANESE (II) FROM AQUEOUS SAMPLES USING CHEMICALLY MODIFIED WALNUT SHELL BIOMASS: EQUILIBRIUM, KINETIC AND THERMODYNAMIC STUDY

Mahmoud Soliman

Kuwait University

E-mail: mahmoud131982@gmail.com

This study is focused on the investigation of equilibrium, kinetics and thermodynamics of the Bismuth (III) and Manganese (II) biosorption from aqueous samples by chemically modified walnut biomass. Optimum biosorption conditions developed under optimum pH, biomass dosage, metal concentration and contact time. The higher biosorption percentage was found at pH 4 for Bi(III) and pH 9 for Mn(II), the optimal biomass concentration was selected as $1.0 \text{ g}\cdot\text{L}^{-1}$ for Bi(III) and $5.0 \text{ g}\cdot\text{L}^{-1}$ for Mn(II) and equilibrium was reached within 30 min for Bi(III) and 180 min for Mn(II) at room temperature.

**PYROLYSIS OF 1-ALKYLAZETIDINONE DERIVATIVES: A
VERSATILE ROUTE TOWARD ELECTRON-RICH ALKENES,
C-1 ALLYLATION AND/OR HOMOLOGATION OF
ALDEHYDES**

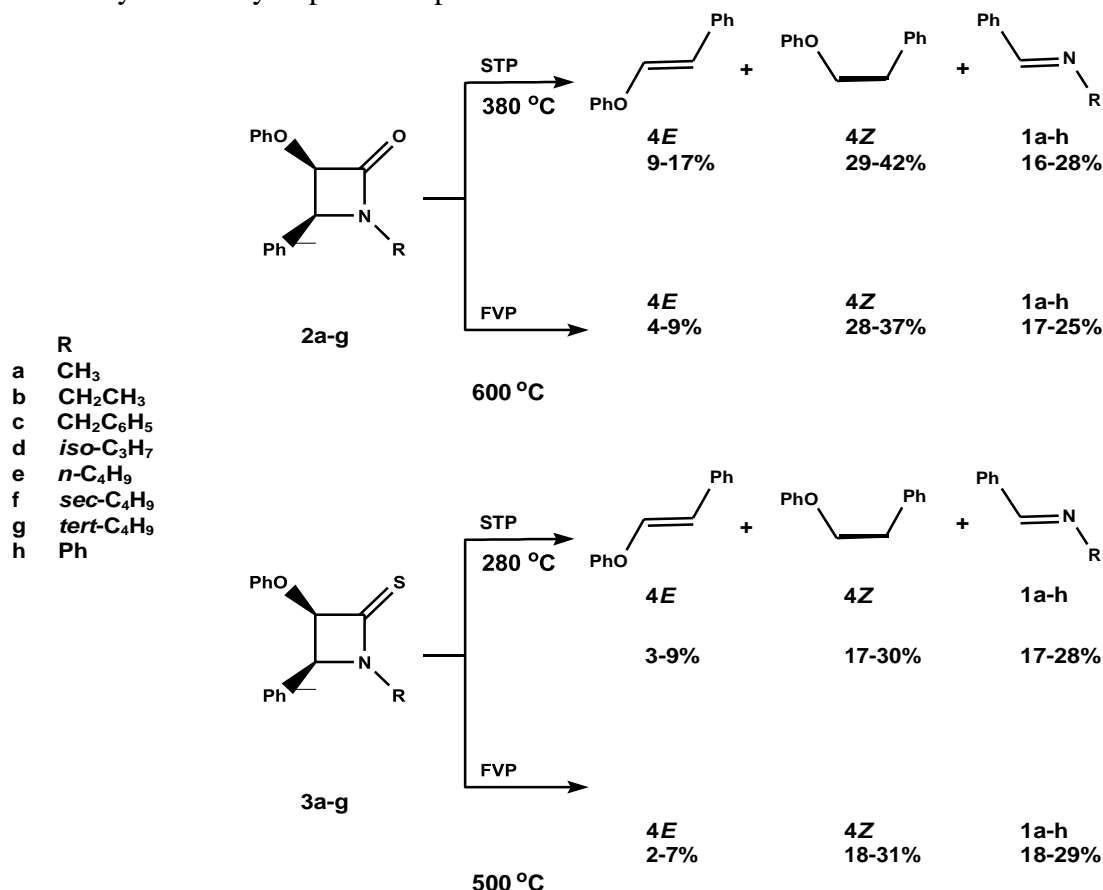
Osama M. Habib^{a,b}, Yehia A. Ibrahim^b, Nouria A. Al-Awadi^b

^a *Biochemistry Department, Faculty of Medicine, Kuwait University, Kuwait*

^b *Chemistry Department, Faculty of Science, Kuwait University, Kuwait*

osama.habib@HSC.EDU.KW

1-Alkyl-3-phenoxy- β -lactams have been synthesized by the standard Staudinger ketene-imine [2+2] cycloaddition. The corresponding β -thiolactams have readily been obtained in good yields by thiation with Lawesson's reagent. Static pyrolysis (STP) as well as FVP of these β -lactams and β -thiolactams led essentially to stereoselective synthesis of Z-alkenes. The 3-allyloxy-1-alkyl- β -lactams and β -thiolactams have also been prepared and gave upon pyrolysis 4-pentenal derivatives. Pyrolysis of 1-alkyl- β -lactams offers better yield than those reported from the corresponding 1-aryl derivatives, it also provides an easy access to the high energy electron-rich Z-alkenes and the synthetically important 4-pentenal^{1,2}.



Scheme 1. Products of STP and FVP of cis β -lactam **2a-h** and cis-thio- β -lactams **3a-h**.

References

1. Habib, O. M., Ibrahim Y. A., Al-Awadi, N. A., *J. Analytical and Applied Pyrolysis*. **2017**,

125, 162–168.

2. Al-Hamdan, N.S., Habib, O.M., Ibrahim, Y. A., Al-Awadi, N. A., El-Dusouqui, O.M.E., RSC Adv. **2014**, 4, 21023–21031.

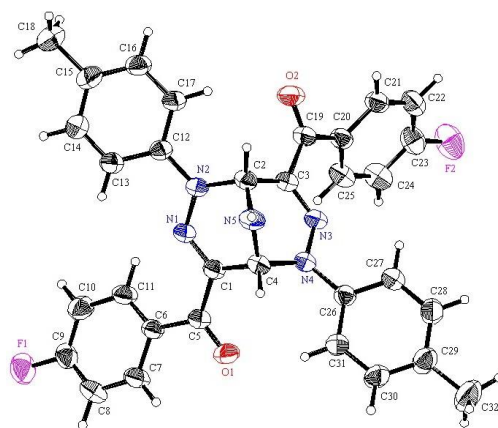
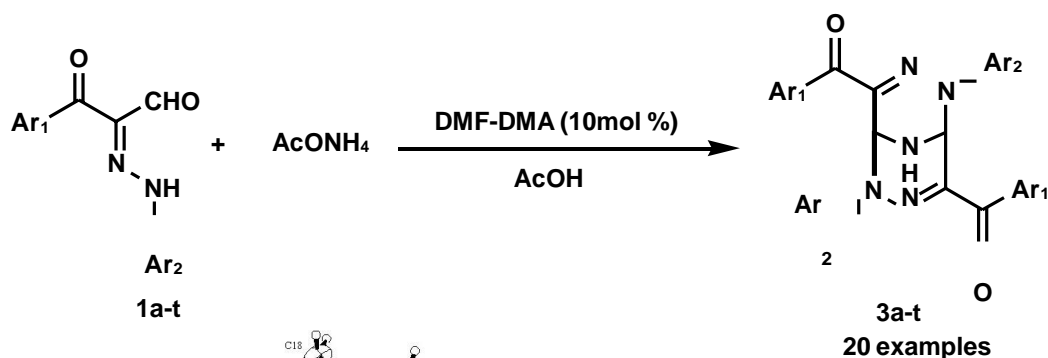
Acknowledgements: This work was funded by the Research Administration of the University of Kuwait through Research Grant SC 011/12.

**A SUSTAINABLE EFFICIENT ULTRASONIC-MEDIATED
ONE-POT SYNTHESIS OF 2,3,6,7,9-
PENTAAZABICYCLO[3.3.1]NONANES VIA A N,N-
DIMETHYLFORMAMIDE DIMETHYLACETAL CATALYZED
MANNICH-LIKE REACTION**

Hamada Mohamed Ibrahim, Haider Behbehani

*Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait
e-mail: hamadaaldeb@yahoo.com*

A novel and straightforward method for one-pot synthesis of functionalized 2,3,6,7,9-pentaazabicyclo[3.3.1]nonane derivatives has been developed. The process, which involves ultrasonic irradiation promoted Mannich reaction between 3-oxo-2-arylhydrazonopropanals and ammonia in acetic acid, is catalyzed by N,N-dimethylformamide dimethylacetal (DMF-DMA) and generates the target products in 80-93% yields. These products showed promising results as anti-cancer agents.



ORTEP plot of the X-ray crystallographic data determined for 3c.

Scheme 1. Synthesis of the 2,3,6,7,9-pentaazabicyclo[3.3.1]nonane derivatives **3a-t**.

References

- Behbehani, H. Ibrahim, H. M. *RSC Adv.*, **2015**, *5*, 89226-89237.
- Behbehani, H. Ibrahim, H. M. Dawood, K. M. *RSC Adv.*, **2015**, *5*, 25642-25649.

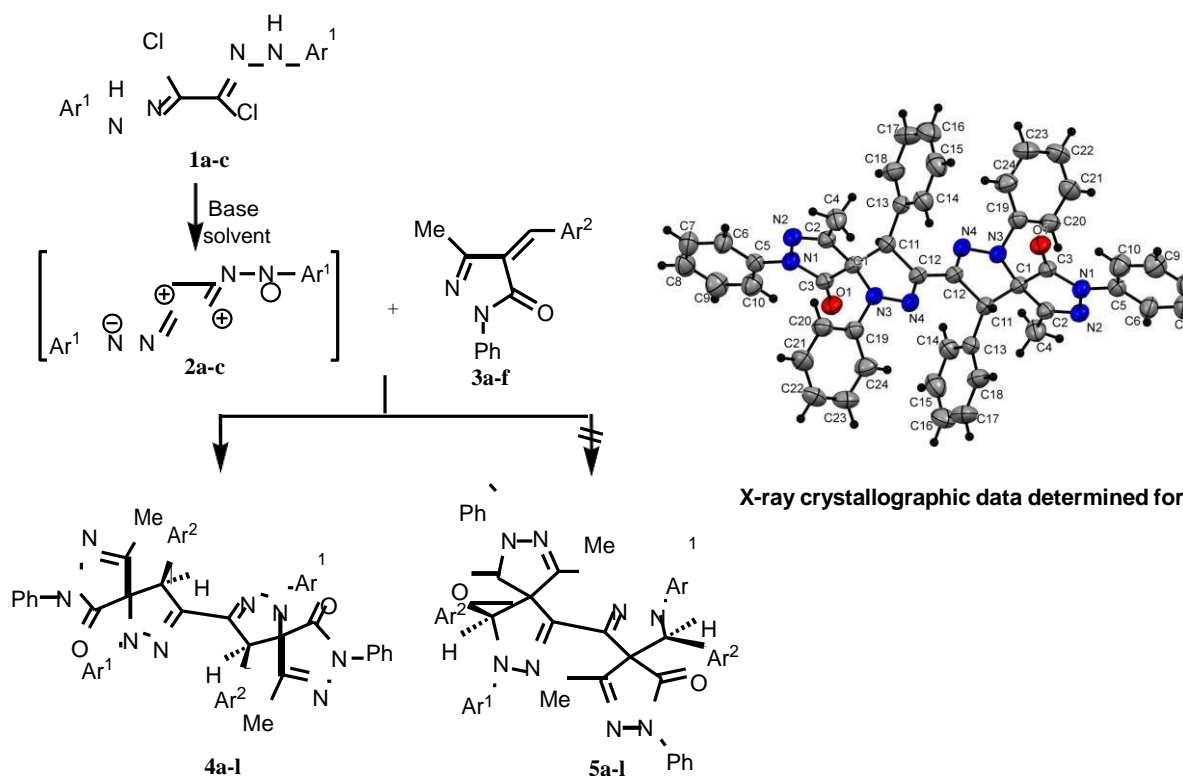
Acknowledgements: This work was funded by Kuwait University through a research grant (SC 14/13).

REGIO- AND STEREOSELECTIVE ROUTE TO BIS-[3-METHYL-1,1',4'-TRIARYL-5-OXO-SPIRO-PYRAZOLINE-4,5'-PYRAZOLINE] DERIVATIVES VIA 1,3-DIPOLAR CYCLOADDITION UNDER SONICATION AS NOVEL ANTIMICROBIAL AGENTS

Noha S. Mostafa, Haider Behbehani, Kamal M. Dawood, Hamada M. Ibrahim

Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait
e-mail: hamadaaldeb@yahoo.com

Bis-[3-methyl-1,1',4'-triaryl-5-oxo-spiro-pyrazoline-4,5'-pyrazoline] derivatives are synthesized regio- and stereoselectively *via* 1,3-dipolar cycloaddition of the bis-hydrazonoyl chlorides with 4-arylidene-pyrazol-5-one derivatives. The cycloaddition route is optimized under both ultrasonic irradiation and conventional heating modes. The regio- and stereoselectivity of the cycloadducts are confirmed by spectral and X-ray crystallographic analysis. Most of the synthesized compounds exhibit promising activity against bacteria and fungi.



Scheme 1. Synthesis of bis-[spiropyrazoline-4,5'-pyrazoline] **4a**.

References

- Behbehani, H. Ibrahim, H. M. Dawood, K. M. *RSC Adv.*, **2015**, *5*, 25642–25649
- Deng, X. Mani, N. S. *Org. Lett.*, **2008**, *10*, 1307-1310.

Acknowledgements: This work was funded by Kuwait University through a research grant (SC 06/15).

IDENTIFYING THE DEVELOPMENT OF PLASTIC FILM PRODUCT ORIGINATED FROM SOLID WASTE USING SEM

A.AiRowayeh, S.ALSalem, A.AIHazza

^{1,3}*Nanotechnology & Advanced Materials Program, Energy & Building Research Centre, Kuwait Institute for Scientific Research (KISR), P.O. Box 24885, Safat 13109; Kuwait.*

¹*Environmental Pollution & Climate Program, Environment & Life Sciences Research Centre, Kuwait Institute for Scientific Research (KISR), P.O. Box 24885, Safat 13109; Kuwait.*

Scanning Electron Microscope (SEM) was used to examine the exposure accelerated weathering (AW) of various formulation compound using extrusion blown film assembly. Two different film samples were used in this work, Linear Low Density Polyethylene (LLDPE) and plastic solid waste (PSW) of polymeric origin. The samples were exposed to various accelerated weathering (AW) durations reaching threshold limit (360 hours of continuous weathering exposure). Also, a cross sectional analysis for polyolefin blends within the polymer matrix was studied. SEM images were taken at different magnifications for each film to evaluate the attack of the weathering exposure on the polymers film.

Keywords: microscopy, plastic, waste, cross sectional, polymer.

GREEN SYNTHESIS OF ZINC-NANOPARTICLES USING CAPILLARY-FURNACE LED BASED REACTOR FROM PORTULACA OLERACEA LEAF AND ITS APPLICATIONS IN ANTIMICROBIAL ACTIVITY

Fadi Ibrahim*

**Department of Chemistry, Saad bin-alrabee alansari School Kuwait*

The present paper discusses synthesis of zinc nanoparticles (ZnNPs) from different leaf extract concentrations of *Portulaca oleracea*. Microfluidic controlled multistep thermal-polymerization by Capillary-Furnace under LED irradiation (TPCFL) synthesis procedures used as a novel way for synthesis of series of (ZnNPs) in terms of improved product control, reproducibility and automation [1]. The formation of zinc nanoparticles was confirmed by the surface plasmon resonance absorption peak at 506 nm in UV-vis absorption spectra of the synthesized zinc nanoparticles. The biosynthesized nanoparticles were characterized by UV-vis absorption spectrophotometry, fourier transform infrared spectroscopy, X-ray diffraction, field emission scanning electron microscopy, energy dispersive X-ray, atomic force microscopy, transmission electron microscopy, photoluminescence and zeta-potential techniques. The photoluminescence spectra of synthesized (ZnNPs) show their emission peak at 388-383 nm and the emission intensity is proportional to the different concentrations of leaf extract. The spherical shaped (ZnNPs) are observed by atomic force microscopy technique. The zeta-potential value is observed at +23 mV, which shows the synthesized (ZnNPs) are incipient instability. The antimicrobial activity of the synthesized nanoparticles was studied using the disc diffusion method, which indicates that both Gram positive and Gram negative microorganisms have been affected by the (ZnNPs). The observed antiviral activity could be find important applications in medicine, biology and industry.

Keywords

Antimicrobial activity; Zinc nanoparticles; *Portulaca oleracea* Leaf; Surface plasmon resonance; Face centered cubic; Atomic force microscopy.

APPLICATION OF DATE PITS AS GREEN ADSORBENTS FOR REMOVAL OF HEAVY METALS: A FACTORIAL DESIGN APPROACH

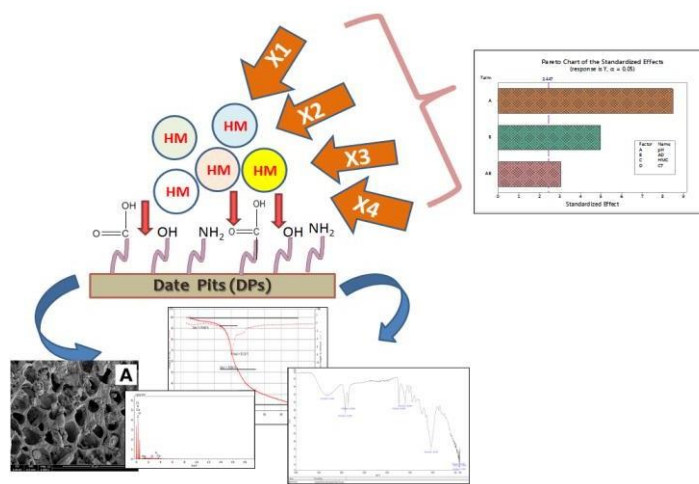
A. Al-Yafei¹, M. Elazazy¹, A. Abdelatty¹, M. Al-Sulaiti¹, B. Shomar², K. Al-Saad¹

¹ Department of Chemistry and Earth Sciences, College of Arts and Sciences, Qatar University, Qatar

² Qatar Environment and Energy Research Institute (QEERI), Hamad Bin Khalifa University, Qatar
asma.alyafei@qu.edu.qa

In this study; date pits (DPs) were exploited as green adsorbent to clean wastewater samples. Adsorption of heavy metals both by raw date pits (RDP) and burnt date pits (carbon, BDP) was tested using ICP-OES and AAS. Results showed that BDP is more efficient as an adsorbent and mostly adsorbing Cu(II). A novel approach; fractional factorial design was used to build the experimental pattern of this study. Four factors were considered and one response was measured, maximum % of removal. Significant variables were detected using Pareto chart of standardized effects, normal and half-normal plots together with analysis of variance (ANOVA) at 95.0 confidence intervals (CI). The subsequent step, optimizing (maximizing) the adsorption efficiency of BDP was performed using optimization plots and Derringer's function. Scanning electron microscopy (SEM) was used to study the surface morphology of both adsorbents while FTIR was employed to get an idea on the functional groups on the surface and hence the adsorption mechanism. Both adsorbents were characterized using TGA, and EDX.

1,2



References

1. Al-Ghouti, M. A.; Li, J.; Salamh, Y.; Al-Laqtah, N.; Walker, G.; Ahmad, M. N. M., *J. Hazard. Mater.* **2010**, 176, 510.
2. Myers, R. H.; Montgomery, D. C.; *Response Surface Methodology: Process and Product Optimization Using Designed Experiments*, Wiley, New York, **2009**.

Acknowledgements: This research has been funded by Qatar University and by Qatar National Research Fund (a member of The Qatar Foundation).

STRATEGIES TO INTEGRATE EDUCATION FOR SUSTAINABLE LIVING IN THE ARTS AND CULTURE LEARNING AREA

T.C Naick

T.C.Naick, Khamis Mushayt, Saudi arabia
e-mail: kellynaick312@hotmail.com

The Revised National Curriculum Statement in South Africa does not emphasize the need for Education for sustainable living (EFSL) in the ARTS and Culture learning area. Although the curriculum envisages a learner who respects the environment, the curriculum does not cater for the needs of the educators who are relatively new to environmental education and especially EFSL. Educators are faced with a multitude of barriers and constraints. This research attempts to identify the barriers and provide strategies and recommendations to integrate EFSL in the Arts and Culture learning area.

The barriers were identified through a questionnaire that was given to educators in South Africa. Questionnaires were given to schools in rural and urban areas. The strategies and recommendations are highlighted using the researchers personal experience in the educational setting, the use of literature and the researchers encounters at the International Childrens Conference on the Environment in the USA and the World Environmental Conference in Japan.

A NEW GREEN SUPRAMOLECULAR SOLVENT-BASED LIQUID–LIQUID MICROEXTRACTION METHOD FOR ALUMINUM DETERMINATION IN REAL WATER, HAIR AND BIOLOGICAL SAMPLES COLLECTED FROM SAUDI ARABIA

Ayman A. Gouda^{a,b,*} and Soad S. Abd El-Hay^{c,d}

^a Faculty of Public Health and Health Informatics, Umm Al Qura University, Makkah, Saudi Arabia.

^b Chemistry Department, Faculty of Sciences, Zagazig University, Zagazig 44519, Egypt;

^c Faculty of Pharmacy, Pharmaceutical Chemistry Department, King Abdulaziz University, Jeddah 21589, Saudi Arabia.

^d Faculty of Pharmacy, Department of Analytical Chemistry, Zagazig University, Zagazig 44519, Egypt.

Tel: +966542087968 e-mail: aymangouda77@gmail.com

A new green supramolecular solvent based liquid–liquid microextraction (SsLLME) method has been developed and validated to preconcentrate and determine aluminum [Al (III)] in various real samples collected in Saudi Arabia. The presented preconcentration method is simple, fast, sensitive, and validated based on using 1-decanol/THF as supramolecular solvent (Ss) phase and quinalizarin as a chelating agent. Al(III)-quinalizarin hydrophobic complex was obtained at pH 7.0, extracted into the supramolecular solvent phase (1-decanol/THF), centrifuged and then measured at 580 nm. The analytical parameters and matrix ions that could affect the extraction efficiency like pH, amount of quinalizarin, type, ratio or volume of Ss, ultrasonication and centrifugation time, sample volume was varied to explore optimal analyte recovery. Validation of the procedure was verified by using certified referencematerials. The calibration curve was linear in the concentration range of 2.0-150 $\mu\text{g L}^{-1}$. The preconcentration factor was determined to be 40 and able to detect Aluminium ions present in very low concentration up to 0.20 $\mu\text{g L}^{-1}$ indicating its selectivity. Precision was confirmed by the low relative standard deviation RSD% (1.0%). Furthermore, the proposed method has been successfully applied for determination of aluminium in real water, hair and biological samples. Results were consistent with the certified reference materials confirming the reliability of the method.

Keywords: Aluminum (III); Supramolecular solvent microextraction; Quinalizarin; Spectrophotometry; Water, hair and biological samples.

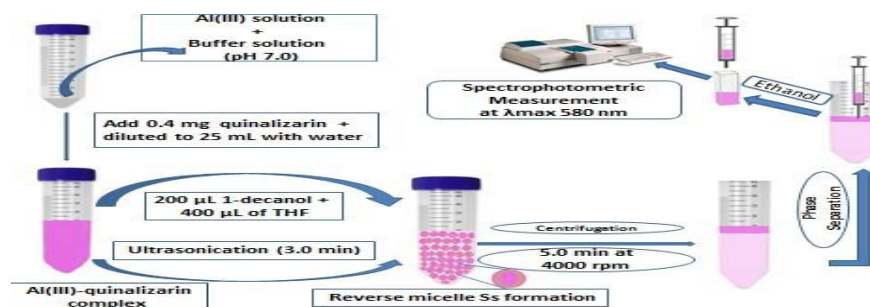


Fig. 1. The procedure of the SsLLME technique.

References

1. Panhwar, A., Tuzen, M., Kazi, T.G., *Talanta*. **2018**, 178,588–593.
2. Gouda, A.A., *Int. J. Environ. Anal. Chem.* **2014**, *94*, 1210-1222.

Acknowledgements: This work was funded Deanship of Scientific Research of Umm Al-Qura University for the financial support (Project No. ID 15-SCI-3-1-0011).

SYNTHESIS AND APPLICATION OF CARBON NANOPARTICLES FROM AGRICULTURAL WASTE AND THEIR CHARACTERIZATION

Muhammad Zahid Qureshi¹, Rabia Hayee²

Government College University, Lahore, Pakistan

Aim of the research work is to study the synthesis of carbon nanoparticles from *T. bicornis* (singhara). *Trapa bicornis* peels were used to produce carbon nanoparticles, which are being widely used in both industry and research area. Pyrolysis was done to synthesize carbon nanoparticles from low cost and easily available *T. bicornis*. Characterization of carbon nanoparticles was done by UV/Visible spectroscopy and BT-90 nanoparticles size analyzer. UV/visible spectrophotometer were used to observe the maximum absorption at 213nm. X-ray diffraction revealed strong peaks obtained as “ 2θ = 28 degree, 48 degree, and 42 degree indicating the presence of the Nano-carbons as C(002), C(100), C(101). BT-90 Nano-particles size analyzer peaks revealed size as 75nm and 534 nm of Nano-carbons. Solid waste disposal is the one of the major problem that world is facing nowadays. The one best way to overcome this issue is to utilize this waste in beneficial way. The microstructure of pyrolyzed carbon depends critically on the carbon source and hence a porous carbon source like peel of *T. bicornis* can produce highly porous carbon with high surface area and good absorption properties. Carbon nanoparticles can be used extensively in the manufacture of tyres, electrometers, wireless electronic log, bio sensing, computer transistors, chemical sensors and many other fields of science.

Keywords: *Trapa bicornis*, Carbon nanoparticles, BT-90 Nanoparticles

THE INHIBITION EFFECTS OF VARIAMINE BLUE ON CORROSION BEHAVIOUR OF COPPER IN CHLORIDE SOLUTION

Güray Kılınççeker^{1*}, Sema Çelik¹, M. Kemal Sangün²

¹*Çukurova University Faculty of Sciences and Letters,
Department of Chemistry, 01330, Adana, Turkey*

²*Mustafa Kemal University, Faculty of Sciences and Letters,
Department of Chemistry, 31060 Hatay, Turkey
E-mail: gkilinc@cu.edu.tr¹*

The corrosion behaviour of copper in 3.5% NaCl solution (pH=3.5) solutions with the absence and presence of Variamine Blue has been investigated by electrochemical techniques such as potentiodynamic polarization and electrochemical impedance spectroscopy (EIS). The optimum concentration of the studied inhibitors showing highest inhibition efficiency was also evaluated at constant temperature (298 K). The inhibition efficiency was found to increase with decrease in concentration of Variamine Blue. Thermodynamic parameter ΔG for the adsorption process were determined. Scanning electron microscopy (SEM) observations of the copper surface confirmed the existence of such an adsorbed film.

Keywords: Copper; Electrochemical techniques; Corrosion; Adsorption isotherm; Thermodynamic parameter.

References

- [1] Çelik, S., Kılınççeker, G., *AKU J. Sci. Eng.*, **2017**, 17 (015702), 192-202.
- [2] Çelik, S., Kılınççeker, G., *Pamukkale Univ Muh Bilim Derg*, **2017**, 23(7), 861-869.
- [3] Kılınççeker, G. *Colloids Surf. A: Phys. Eng. Asp.*, **2008**, vol. 329, p. 112.
- [4] Çelik, S., Kılınççeker, G. ve Sangün, M.K., *Technological Applied Sciences*, **2017**, 12(1), 25-37.
- [5] Kabasakaloğlu, M., *Corrosion*, **1991**, vol. 3, p. 23.
- [6] Kabasakaloğlu, M., *Corrosion*, **1991**, vol. 3, p. 43.
- [7] Kılınççeker G., Yazıcı B., and Erbil, M., *Corrosion*, **1999**, vol. 10, p. 19.
- [8] Kılınççeker, G., Erbil, M., *Mat. Chem. Phys.*, **2010**, vol. 119, p. 30.
- [9] Pourbaix, M. *Atlas of Electrochemical Aqueous Solutions*, PergamonPress, **1966**.
- [10] Kılınççeker, G., Galip, H. *Mater. Chem. Phys.* **2008**, vol. 110, p. 380.

Acknowledgement : The authors are greatly thankful to Cukurova University Research Found for financial support (Project number of FBA-2018-10136).

THE EFFECTS OF SODIUM NITRITE ON CORROSION RESISTANCE OF STEEL REINFORCEMENT IN CONCRETE

Güray Kılınççeker^{1*}, Nida Yeşilyurt¹, M. Kemal Sangün²

¹*Department of Chemistry, Faculty of Sciences and Letters, Çukurova University, 01330, Balcalı, Sarıçam, Adana, Turkey*

²*Department of Chemistry, Faculty of Sciences and Letters, Mustafa Kemal University, 31060 Hatay, Turkey*

E-mail: gkilinc@cu.edu.tr¹, nidayesilyurt@hotmail.com¹, ksangun@gmail.com²

This study describes a laboratory investigation of the influence of sodium nitrite on the corrosion of reinforcing steel and the compressive strength of concrete. The effect of sodium nitrite on the corrosion resistance of steel reinforced concrete was evaluated by carrying out electrochemical tests in 3.5% NaCl for 90 days. Polarization resistance (R_p) values of sodium nitrite added reinforced concrete were much higher than those without sodium nitrite in 3.5% NaCl solution. Similarly, AC impedance spectra revealed that the resistance of sodium nitrite mixed electrodes was also quite higher than those without. The compressive strength of concrete specimens containing sodium nitrite was measured and an increase was observed with respect to 3.5% NaCl environment.

Keywords: Reinforcing steel; Corrosion; Acetate ions; Cement; Concrete; Electrochemical techniques;

*Corresponding author, E-mail address: gkilinc@cu.edu.tr
Tel.: +90 322 338 60 81-2494; Fax: +90 322 338 60 70

References

- [1] Kılınççeker, G., Menekşe, C., Protection of Metals and Physical Chemistry of Surfaces, 2015, 51 (4), 659-666.
- [2] Kılınççeker, G., Doğan, T., Protection of Metals and Physical Chemistry of Surfaces, 2016, 52 (5), 910-920.
- [3] Kılınççeker, G. Colloids Surf. A: Phys. Eng. Asp., 2008, vol. 329, p. 112.
- [4] Kılınççeker, G., Galip, H. Protect Met. Phys. Chem. Surf., 2009, vol. 45, p. 232.
- [5] Kılınççeker, G., Erbil, M., Mat. Chem. Phys., 2010, vol. 119, p. 30.
- [6] Kılınççeker, G., Galip, H. Mater. Chem. Phys. 2008, vol. 110, p. 380.

POLY(2-CHLOROANILINE) AND POLY(ANILINE-CO-2-CHLOROANILINE) FILMS ON ZNFE ALLOY PLATING

M.K. Sangun^a, A. Akdag^b, G. Ozyilmaz^a and A.T. Ozyilmaz^a

^a*Department of Chemistry, Faculty of Arts and Sciences,
Mustafa Kemal University, 31040 Hatay, Turkey.*

^b*Department of Medical Laboratory Techniques, Vocational School of Health Services,
Harran University, Sanliurfa, Turkey.*

E-mail: ksangun@gmail.com

Zinc-iron alloy plating (ZnFe) was successfully achieved on carbon steel (CS) applying 3 mA constant current value. The poly(2-chloroaniline) (PCANI) and poly(2-chloroaniline-co-aniline) P(CANI-co-ANI) films on ZnFe plated CS electrode were synthesized by cyclic voltammetry technique using monomer(s) containing 0.20 M sodium oxalate solution. The CS/ZnFe electrodes with and without PCANI or P(CANI-co-ANI) films were characterized using SEM and anodic linear sweep voltammograms. The anticorrosive behaviors of uncoated and coated electrodes were studied in 3.5% NaCl solution by corrosion techniques which include open circuit potential measurements, the anodic polarization curves and AC impedance spectroscopy (EIS) technique. The results showed that P(CANI-co-ANI) coating on ZnFe plated CS electrode exhibited higher corrosion resistance and provided better barrier property in comparison with PCANI coating as well as ZnFe alloy plating, in longer exposure time.

Keywords: Corrosion, ZnFe plating, polyaniline, alloys, carbon steel, conducting polymer

References

- [1] A.T Ozyilmaz, B. Avsar, G. Ozyilmaz, I.H. Karahan, T. Camurcu, F. Colak, Appl. Surf. Sci. 318, 262 (2014).
- [2] S. Toprak Doslu, B. Dogru Mert, B. Yazıcı, Corros. Sci. 66, 51 (2013).
- [3] J. Winiarski, A. Laszczyńska, and B. Szczygieł, Trans. IMF, 93 (5), 267–274, 2015.

DETERMINATION OF PANI|PPy AND PANI FILMS EFFECT ON CORROSION BEHAVIOR OF ZnNi COATED CARBON STEEL

A. T. Ozyilmaz, M. K. Sangun, I. Filazi, C. Surmelioglu, G. Ozyilmaz

Department of Chemistry, University of Mustafa Kemal, 31060 Hatay, TURKEY

ksangun@gmail.com, atuncay@mku.edu.tr

Nowadays, technical metal and alloy materials have an important place in the industry. The utilization rate of steel, which is obtained by carbon addition to iron and finds a very common usage area among the technical metallic materials, has reached to millions of tons today (Wikipedia, 2016). However, this rapidly increasing rate of use also increases the damage caused by corrosion reactions, which in turn causes the metals to wear out. Corrosion is an unstoppable phenomenon of nature, causing loss of life and property directly or indirectly, causing serious damage to the state and industry, causing a loss of 3.5 to 5% per annum of GNP (Uneri, 2011). Today, researchers in many disciplines are constantly looking for new ways to protect materials used from corrosion and thereby reduce damage caused by corrosion. Alloy coating is one of the techniques used for this purpose. Especially zinc nickel group coatings are used as many industrial coating materials especially in the automotive industry due to its high corrosion resistance and mechanical strength. Considering the literature studies in recent years, it is seen that conductive polymers are of interest in the field of corrosion protection due to their unique properties such as superior anticorrosive properties, redox reaction in the environment, conductivity that can be removed to the metal level (Ozyilmaz *et al.*, 2013; Karahan *et al.*, 2014; Ates 2016).

In this study, the surface of the carbon steel electrode (CS), one of the most used alloys in the industry, is coated with a zinc nickel (ZnNi) alloy coating with a thickness of approx. 5 μm by means of chronopotentiometry (CP) technique in the citrate sulphate bath. A thin polyaniline (PANI) film was synthesized by the use of alternating voltammetry (CV) technique of electrolyte containing sodium oxalate and aniline on the alloy coated electrode surface. Polypropylene (PPy) film was synthesized by CV technique in the presence of acetonitrile + tetrabutylammonium perchlorate as the overcoat on the resulting CS / ZnNi | PANI surface. The metallic characterization of the obtained coated and uncoated electrodes was made by linearly scanning voltammetry curves in the sodium sulfate and EDTA solution; corrosion performances were evaluated with the aid of anodic polarization curves, open-circuit potential-time curves and AC impedance spectroscopy (EIS) in 3.5% NaCl aqueous solution. The corrosion performance of the electrodes obtained after 240 hours shows that all coatings on the electrode surface are effective in protecting the carbon steel material from corrosion. Long-term alloy and PANI film coating on this alloy enhance the protection of carbon steel; but the PPy polymer film synthesized as the top layer on the CS / ZnNi PANI electrode surface was found to reduce this resistance.

References

- Ates, M. (2016). A review on conducting polymer coatings for corrosion protection", *Journal of Adhesion Science and Technology*, 30(14), 1510-1536.
- Karahan, I. H. and Tozar, A. (2014). Corrosion inhibition performance of polymer-alloy bilayer coatings: electropolymerised polyaniline and electrodeposited ZnNi with different layer orders, *Transactions of the IMF*, 92 (5), 262-271.

GLUCOSE BIOSENSOR CONSTRUCTION BY ENTRAPMENT OF GLUCOSE OXIDASE IN POLYRHODANINE SYNTHESIZED ON CARBON PASTE ELECTRODE

G.Ozyilmaz, M.K.Sangün, A.T.Ozyilmaz

Mustafa Kemal University, Faculty of Science and Letters, Department of Chemistry, Hatay, TURKEY
e-mail: ksangun@gmail.com

Carbon paste was prepared by mixing graphite and mineral oil in a mortar. Carbon paste was filled into an insulating cylindrical body to obtain carbon paste electrode (CPE). CPE was coated by polyrhodanine by cyclic voltammetry technique in sodium oxalate electrolyte solution. Glucose oxidase (GOx) was added into electropolymerization medium to construct glucose biosensor. Therefore, enzymemolecules were entrapped during the electropolymerization in polyrhodanine matrix. As a result, a glucose sensitive electrode was obtained. Figure 1 (A) shows the first cycle of polyrhodanine film growth in absence and in presence of GOx. Glucose biosensor was used to measure current response in glucose solution by chronoamperometric method. Figure 1 (B) shows the chronoamperometric measurement diagram in phosphate buffer and glucose solutions at different concentrations as 0.25, 1 and 2 mM glucose solutions.

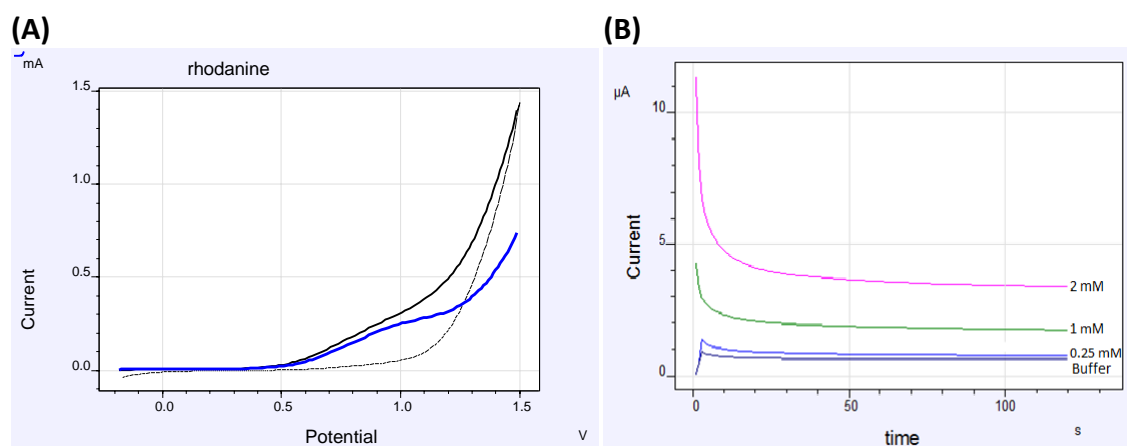


Figure 1. (A) First cycle of polyrhodanine growth diagram in absence (blue) and in presence (black) of GOx (B) Chronoamperometric diagram of GOx electrode in buffer and glucose solutions.

As seen in Figure 1 (A), the increase in current values of film growth diagram in presence of GOx showed the increase in electron transfer rate depending on enzyme molecule. Obtained electrode is sensitive to glucose molecule as seen in Figure 1 (B).

RHEOLOGY AND STABILITY OF EMULSIONS OF SOME ACACIA GUMS

Rabeea Daoub^{a,b*}, Misni Misran^b, Elfatih Hassan^a, Mohammed Osman^a

^a Sudan University of Science and Technology, P.O. Box 407 Khartoum, Sudan.

^b Department of Chemistry, Faculty of Science, University of Malaya, 50603, Kuala Lumpur, Malaysia.

*E-mail: rabiea.daoub@gmail.com

Authentic representative gum samples of *Acacia senegal* var. *senegal* (ASG) and *Acacia mellifera* (AMF) from *Vulgares* series and *Acacia seyal* var. *seyal* (ASY) and *Acacia tortilis* var. *raddiana* (ATR) from *Gummiferae* series, were physicochemically studied. The moisture, nitrogen and protein content, and specific optical rotation were found to be 9.76%, 0.327%, 2.158%, and -31.75 for ASG, 9.56%, 0.630%, 4.158% and -48.25 for AMF, 8.35%, 0.243%, 1.610%, and +56.00 for ASY and 8.49%, 1.549%, 10.378%, and +86.75 for ATR respectively. Gum's O/W emulsions were prepared using different concentrations of isopropyl myristate as dispersed phase. The rheological flow profiles of all gum's O/W emulsions showed oil's concentration dependence; The viscosity of ASG and AMF gum emulsions displayed Shear-thinning behavior at low shear rate, Newtonian flow behavior was also observed at shear rate beyond 50 s⁻¹ suggesting the alignment of gum molecules with the shear direction. ASY displayed a nearly Newtonian flow behavior in the whole range of oil's concentrations studied except for the 10% oil concentration. ATR gum emulsion flow profile exhibits a shear thinning flow behavior in general and a Newtonian flow beyond 100 s⁻¹ shear rate. The dynamic rheological study showed moduli frequency dependence pattern suggesting network formation of the gum molecules around the oil droplets of the emulsion. Emulsions dispersed phase droplets size measurements showed that the emulsion stability and emulsifying power of the studied gums may be arranged in following order: ATR<ASY<AMF<ASG. Phase separation were observed at low oil concentration for all gum emulsions.

PLATINUM CATALYST: A NOVEL TOOL FOR GREEN FLOW CHEMISTRY APPROACH IN PHARMACEUTICAL INDUSTRY.

Firas A. H. Albadran⁽¹⁾ Israa Saad Mustafa⁽²⁾

- (1) *University of Basrah for Oil and Gas, College of Oil and Gas Engineering, Department of Chemical Engineering, Iraq.*
 (2) *Ministry of Health, Basrah Health Directory, Department of Pharmacy, Iraq.*

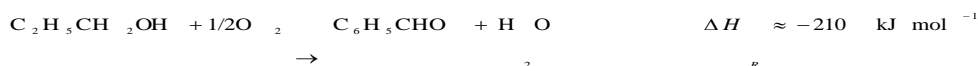
Catalytic selective oxidation in the liquid phase is an actively developing research area due to industrial interest in those types of reactions and the increasing need to substitute conventional stoichiometric oxidising reagents, such as nitric acid, organic peroxide and metal oxide, with environmentally benign oxidants, such as air, molecular oxygen and hydrogen peroxide (Bavykin *et al.*, 2005).

The monolith honeycomb structure is widely used as nanoparticles catalyst support for a gas treatment application (e.g. cleaning of automotive exhaust gases and industrial off-gases), however, in the last few decades, the use of monoliths has been extended to include applications for performing multiphase reactions such as hydrogenation and oxidation (Cybulski and Moulijn 2006). In many cases monolithic reactors are an attractive to conventional multi-phase reactor due to their advantages of low pressure drop, the absence of need for a catalyst separation, and large geometrical surface area (Nijhuis *et al.*, 2001).

In contrast to the traditional structured catalysis systems, the vast majority of the fixed bed reactors used in industry is randomly packed with catalyst particles of different shapes which normally exhibit some problematic aspects in fluid flow such as high resistance to heat transfer, stagnated zones and high pressure drop (Campos and Ferreira 2001).

In literature, there are many examples of work where the monolith reactors are used as an efficient system to switch from the traditional reactors in pharmaceutical and fine chemistry fields (e.g. Campos and Ferreira 2001; Irandoust 1988; Edvinsson 1994; Nijhuis *et al.*, 2001; Cybulski and Moulijn 2006; etc.).

In this work, a 'methodology' was explored, to help with the development of continuous fixed-bed catalytic reactors in both pharmaceutical and fine chemistry industries. The partial oxidation of benzyl alcohol to benzaldehyde was selected as model reaction to test the visibility of such work using a Pt catalyst on a carbon support. The reaction stoichiometric is represented by:



This proved to be successful, and the reaction was finally demonstrated at pilot-scale. Carbon monoliths were used as catalyst supports (monolith o.d. = 19 mm; length = 50 mm long; square 0.7 mm x 0.7 mm channels; catalyst loading 2.5 and 2.7 wt% Pt). With a liquid flow of 1 L h⁻¹ and a reactant concentration of ~1 mol L⁻¹, operating at 110 °C, conversion ranged from 80 to 90% and selectivity from 65 to 99%. The catalyst system was tested for 160 h of operation, and retained its performance.

While testing this model, a pilot-scale reactor was also developed, which could be used for a variety of novel reactions. The design was flexible and it was easy to insert and remove the catalytic monoliths.

HARDNESS AND IRON ADSORPTION ONTO NATURAL CLAY MINERALS: KAOLINITE/SMECTITE COMPOSITE

I.M. El-Naggar¹, Nabila Shehata², E.S. Sheneshen³, Mahmoud Fathy⁴, M.A. Zayed⁵.

Atomic Energy Authority, Hot Labs, Centre, P. No. 13759, Egypt1-Faculty of the Postgraduates Studies for advanced sciences, Egypt2- Egyptian Petroleum Research Institute, Egypt4- Egyptian Ministry of Environment, Cairo, Egypt3. 5Chemistry Department, Faculty of Science, Cairo University, Giza 12613, Egypt. e-mail: mazayed429@yahoo.com, Tel: 002-02-22728437, 002-01005776675, Fax: 002-02-35728843.

The high hardness and iron of ground water causes some problems in household and industrial use. Therefore, this research was carried out. Natural clays composites are abundantly available low-cost natural resource which is nontoxic to ecosystem. Over the recent years, research on the modification of clay to increase their adsorbent capacity to remove other contaminants from drinking water other than metals is in progress. In this paper several parameters have an impact on the adsorption behavior of Ca^{2+} , Mg^{2+} and iron onto clay mineral from aqueous solution, i.e. pH, exchange time, original ions concentration, and temperature. All factors were carried out through batch technique. Optimum pH for Ca^{2+} , Mg^{2+} and iron adsorption was found to be 6.0. As well as some thermodynamic parameters were calculated ΔG , ΔS and ΔH indicating adsorption was spontaneous, and endothermic. The isotherm modeling was investigated, and the results were showed that Freundlich isotherm model more fitted than Langmuir, indicating the presence of heterogeneous sites for Ca^{2+} , Mg^{2+} and iron adsorption on the natural composite. The adsorbing efficiency of the natural clay composite in the purification of drinking water, when compared to existing technologies, materials, and methods was found to be significantly higher or comparable.

Corresponding Author: *Email: Fathy8753@Yahoo.com.*

OIL POLLUTION OF WATER FROM REFINING UNITS OF BAIJI REFINERIES

Abid Ahmad Erdeni

Tikrit Uni., College of Edu. for Women, .Dept. of Biology, Tikrit, Iraq

bioerdene@yahoo.com

The oil associated with the water from the crude oil refining units at the North Refinery Company in Baiji-Iraq was estimated and diagnosed. The results showed that the concentrations of the propellants are more than the permissible limits, as well as that the oil parts contain mostly useful oil derivatives and high concentrations such as Naphtha and aliphatic and aromatic compounds.

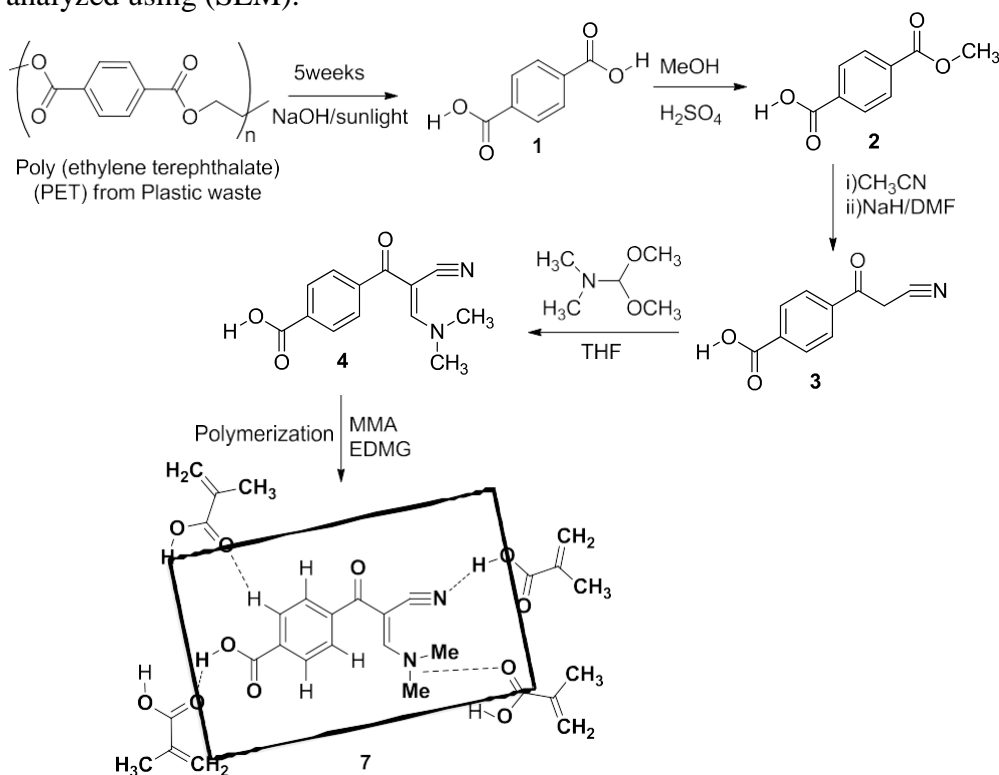
REGIOSELECTIVE SYNTHESIS AND *AB INITIO* CALCULATIONS OF (*E*)-4-(2-CYANO-3-(DIMETHYLAMINO) ACRYLOYL) BENZOIC ACID FROM POLY (ETHYLENE TEREPHTHALATE) WASTE AND ITS NEW MOLECULAR IMPRINTED POLYMER

Asmaa.M.Fahim^{1*}, Bartłomiej Wasiniak², Jerzy P. Łukaszewicz²

¹ National Research Center, Green Chemistry Department, Dokki, P.O. Box.12622 Cairo, Egypt

² Nicolaus Copernicus University, Fundamentals of Chemistry Department, Gagarin Str.787-100 Torun, Poland

Green energy source used for degradation of PET plastic waste, which was versatile intermediate for the synthesis of (*E*)-4-(2-cyano-3-(dimethylamino) acryloyl) benzoic acid (**4**) which were established by the spectral data such as IR, Mass, ¹H and ¹³C NMR. The optimized molecular structure of compound **4** was utilized with basis set 6-31G (d) of Density functional theory (DFT)/B3LYP and Hartree-Fock (HF) energies functional combined with descriptors such as E_{HOMO}, E_{LUMO}, energy gap, and electronic structures. Proton chemical shifts have been registered *via* Gauge-invariant atomic orbital calculation in gaseous and DMSO solvent, utilizing (PCM). The molecularly imprinted polymer was synthesized using polymerization precipitation where compound **4** as the template, functional monomer (methacrylic acid), ethylene glycol dimethacrylate (cross-linker) and 2,2'-azobisisobutyronitrile (initiator). The computations energies between the template and different monomers using Gaussian 09 program based on the application of DFT/ B3LYP and HF/6-31G (d) approaches basis set. MIPs performance arranged with numerous balances of the MAA. Thermal analysis of MIP proved that the prepared materials stability was taken in range 160- 200 °C. The average pore size achieved during the experiment was in the range 0.2-1 nm with the BET surface about 300 m²/g. The homogeneous structure, surface of the prepared polymer was analyzed using (SEM).



EFFECT OF ORGANIC LIGANDS ON THE SORPTION OF RADIOCOBALT ON SOIL AND CLAY

Aly A. Helal, I.M.Ahmed, Naema A.El Aziz*, R. Gamal, Nehal O. Shaker*, A.A. Helal

Hot Labs. Centre, Atomic Energy Authority, Cairo-13759, Egypt

**Faculty of Science, Girls Branch, Al-Azhar University, Cairo, Egypt*

The sorption of radiocobalt onto low cost materials (such as soil and clay) in presence of environmentally available organic ligands (such as humic acid, phenol and gallic acid) is investigated. The investigations were carried out as a function of pH, metal ion concentration and weight of sorbent, using the batch technique. The results indicated that the pseudo second-order equation fitted the kinetic sorption well. The sorption of Co(II) on soil and clay is strongly dependent on pH. A positive effect of humic acid on the sorption of Co(II) is found, whereas a negative effect is observed for phenol and gallic acid. The presence of HA, together with the other ligands, enhances the sorption, in all cases. Generally, the sorption of Co^{2+} is higher for soil than for clay.

REMOVAL OF HEAVY METALS BY TIGHT ULTRAFILTRATION MEMBRANE AT LOW PRESSURE

M. Breida*, S. Alami Younssi, A. Bouazizi, B. Achiou, M. Ouammou, M. El Rhazi

*Laboratory of Materials, Membranes and Environment, Department of Chemistry, Faculty of Sciences
Technologies of Mohammedia, University Hassan II of Casablanca, BP 146
Mohammedia 20650 Morocco.
E-mail address: majda.breida-etu@univh2m.ma*

Large amounts of polluted water are often obtained from the chemical process industry, which require a mandatory treatment before being disposed off. Heavy metals are employed in numerous processes, so recovering and/or recycling of those metals to the reaction unit is essential. In this study, ultrafiltration is presented as a useful technique to remove/ recover heavy metals present in aqueous solutions. Filtration of different electrolyte solutions, copper (II), chromium (VI) was performed by means of γ -Al₂O₃ ultrafiltration membrane with a nominal pore size of 5 nm. The effect of filtration parameters such as pH, applied pressure and salt concentration on the selectivity and permeability of the membrane were studied using single salts K₂Cr₂O₇, CuSO₄, Cu(NO₃)₂ and mixed salts (K₂Cr₂O₇+NaNO₃), (K₂Cr₂O₇+Na₂SO₄) and (CuSO₄+Cu(NO₃)₂). The experimental filtration results showed that salt rejection strongly depended upon the metal's pH and the membrane charge. Ion's rejection increased with an increase of applied pressure. The rejection gradually decreased when the feed concentration increased. It appeared that the valency and hydrated radius of ions had a dramatic effect on ionic specie's rejection. Experimental results demonstrated that increasing the complexity of solution decreased the rejection of metal ions.

Keywords: γ -Al₂O₃ membrane; Ultrafiltration; heavy metal; Charged membrane; wastewater treatment.

Funding statement

This work was supported by MESRSFC (Ministère de l'Enseignement Supérieur et de la Recherche Scientifique et de la Formation des cadres – Morocco) and CNRST (Centre National pour la Recherche Scientifique et Technique – Morocco) (Project number PPR/2015/72).

REMOVAL OF ORGANIC AND INORGANIC POLLUTANT BY MODIFIED NANO ZNO

Shady Mohamed El-Dafrawy*, Salah Fawzy, Shawky Mohamed Hassan
Chemistry Department, Faculty of Science, Mansoura university, Egypt
shomirage@yahoo.com

Water pollution is a worldwide issue that attracted the researcher's attention. It involves the release of toxic substances, pathogenic germs, easy-soluble substances, radioactivity, etc. These pollutants affect human health, aquatic livings and microorganisms. In attempt to improve MB photodegradation rates using ZnO.

A series of tin oxide (SnO₂) doped ZnO photocatalysts were synthesized using sol-gel method with a doping molar ratios (0, 0.01, 0.02, 0.04, and 0.05 M) SnO₂/ZnO. The prepared photocatalysts were characterized by XRD, SEM, TEM, and DRS. The chemical composition of all prepared photocatalysts was confirmed by XRD.

DRS showed a reduction in band gap energy from 3.27 to 3.10 eV by increasing SnO₂ molar ratio. SnO₂ doped ZnO photocatalyst demonstrated the highest photodegradation efficiency which was about 100 % in 90 mins and higher adsorption efficiency to all studied heavy metals which was nearly 100 % to all metals in 1hr.

Keywords: Sol-gel; SnO₂ doped ZnO; Methylene blue; Photocatalysts; adsorption

INVESTIGATION OF DEGRADATION OF 2-CHLOROPHENOL AND 2,4-DICHLOROPHENOL COMPOUNDS IN WASTEWATER BY ULTRASONIC METHOD

C.Pekcan^a, A.M.Gizir^b

Mersin University, Department of Chemistry, Mersin, Turkey.

e-mail: agizir@mersin.edu.tr

Chlorophenols are chemicals used as industrial raw materials in many production processes such as pharmaceuticals, dyes, resins, and wood. The high production, the long biodegradation of chlorophenol compounds in the environment and the easier transport in natural ways in the ecosystem allows chlorophenols to be considered as pollutants. Due to these negative effects, intensive use of chlorophenols in industry causes chlorophenol pollution in underground and surface waters. In this study, systematic degradations of 2-chlorophenol and 2,4-dichlorophenol compounds were investigated using ultrasonic method and response surface method. Experimental design models for 2-chlorophenol and 2,4-dichlorophenol compounds have established and the effects of chlorophenol concentration, time and temperature on the degradation and removal mechanisms of chlorophenols have been observed.

It can be seen in figure 1, the effects of temperature and initial concentration changes on the degradation mechanism were investigated by keeping the working time constant as 210 minutes for 2-chlorophenol and 2,4-dichlorophenol compounds.

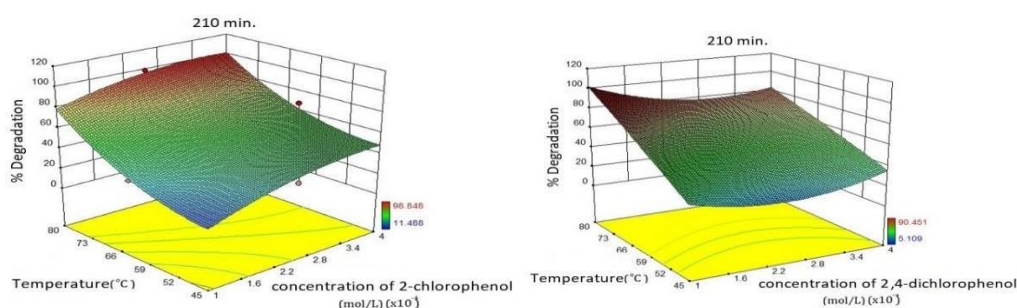


Figure 1. Relation of concentration - temperature -% degradation for 2-chlorophenol and 2,4-dichlorophenol in constant time (210 min.).

References

1. Daswat, D. P., *Photochemical degradation of chlorophenol industry wastewater using peroxy acetic acid*. Chem. Engineering journal **2012**, 209, 1-6.
2. Wang, J.; Ma, X.; Liu, S.; Sun, P., *Biodegradation of phenol and 4-chlorophenol by Candida tropicalis W1*. Procedia Environmental Sciences **2012**, 16, 299-303.

Acknowledgements: This work was funded by Mersin University Research Fund (Project No:2017-2-TP2-2525)

THE ORCHESTRA OF PHYTOEXTRACTION: CAN METABOLITE CIRCULATION INDICATE THE EFFICIENCY OF BRASSICA TO TOLERATE METAL TOXICITY?

A. A. Al-Qatan^a, N. M Al-Mansour^{b*}

^a University of Kuwait, Environmental Sciences Graduate College, State of Kuwait

^b University of Kuwait, Department of Biological Sciences, Plant Biology Program, State of Kuwait
e-mail: q81-89@hotmail.com

Soil metal toxicity is a worldwide environmental problem due to its negative effects on ecosystem's natural resources, agricultural practices and ground water quality. The application of high doses of synthetic fertilizers in cropping systems and the rapid expansion in industrial activities have significantly contributed to the pronounced risks of metal toxicity on public health. Under desert conditions soil particles are not adequately hydrated and much of the toxic metals precipitate on top horizons of soils. The persistence of metals such Al, Cd, Zn and Cu could lead to serious land degradation. Therefore, removing toxic metals from soils is becoming more important for future sustainable development. One feasible approach is the use of plants as an environmentally friendly tool for better agricultural practices and food safety. The objectives of the current project were to (1) characterize the efficiency of field grown *Brassica* sp. seedlings in metabolite circulation and (2) to test metal tolerance of *Brassica* sp. to AlCl₃ and ZnCl₂ using polyphenols as biochemical markers in phytoextraction. Data indicated efficiency of *Brassica* plants in circulating carbohydrates between roots and leaves. Carbohydrates increased from 1.42 ± 0.08 mg g⁻¹ FW in root tip to 3.96 ± 0.29 mg g⁻¹ FW in middle parts of roots. The decrease in carbohydrates in the older parts of roots was accompanied with a significant increase in carbohydrates in younger leaves. Carbohydrates in older leaves was measured as 1.25 ± 0.080 mg g⁻¹ FW but had significantly increased to 5.82 ± 0.33 mg g⁻¹ FW in younger leaves. Overall, total polyphenols in ZnCl₂-stressed seedlings were higher than those measured in AlCl₃ stressed seedlings. Total polyphenolic contents (TPC) in 80mM AlCl₃-stressed leaves were measured as 10.8 ± 0.22 mg/L GA equivalent, but had increased to 16.5 ± 0.02 mg/L GA equivalent in 160mM AlCl₃-stressed leaves. When compared with ZnCl₂ stress, leaf TPC had significantly increased from 13.5 ± 0.17 mg/L GA equivalent in 120mM stressed leaves to 20.5 ± 0.15 mg/L GA equivalent. Interestingly, higher levels of metal toxicity were found to stimulate root growth under both AlCl₃ and ZnCl₂ stresses. Root diameter in the middle areas increased from 1.64 ± 0.24 (mm) in controls to 2.41 ± 0.38 in 160mM AlCl₃-stressed leaves which was comparable to that measured in ZnCl₂-stressed roots. The antioxidant capacity of *Brassica* sp. under metal toxicity is now being studied using ABTS standard operational procedure (SOP) as to further characterize mechanisms of metal tolerance.

Acknowledgements: Authors of the study would like to acknowledge Environmental Sciences Graduate College at University of Kuwait for funding Mr. Ahmed A. Al-Qatan project. Authors would like to thank Mr. Abul Haleem for his help in Green House Experiments, NUERS and RSPU technicians for their help in soil analyses. The biochemical analyses were conducted using Standard Operational Procedures (SOP) established in Stress Ecophysiology laboratory by the P.I of project. Special thanks to the Graduate College for their continuous support and encouragement.

REMOVAL OF HEAVY METALS BY TIGHT ULTRAFILTRATION MEMBRANE AT LOW PRESSURE

M. Breida, S. Alami Younssi, A. Bouazizi, B. Achiou, M. Ouammou, M. Bouhria

*Laboratory of Materials, Membranes and Environment, Faculty of Sciences and Technologies
Mohammedia, University Hassan II of Casablanca, Morocco.
e-mail: alamiyounssisaad@yahoo.fr*

Large amounts of polluted water are often obtained from the chemical process industry, which require a mandatory treatment before being disposed off. Heavy metals are employed in numerous processes, so recovering and/or recycling of those metals to the reaction unit is essential. In this study, ultrafiltration is presented as a useful technique to remove/ recover heavy metals present in aqueous solutions. Filtration of different electrolyte solutions, copper (II), chromium (VI) was performed by means of $\gamma\text{-Al}_2\text{O}_3$ ultrafiltration membrane with a nominal pore size of 5 nm. The effect of filtration parameters such as pH, applied pressure and salt concentration on the selectivity and permeability of the membrane were studied using single salts $\text{K}_2\text{Cr}_2\text{O}_7$, CuSO_4 , $\text{Cu}(\text{NO}_3)_2$ and mixed salts ($\text{K}_2\text{Cr}_2\text{O}_7+\text{NaNO}_3$), ($\text{K}_2\text{Cr}_2\text{O}_7+\text{Na}_2\text{SO}_4$) and ($\text{CuSO}_4+\text{Cu}(\text{NO}_3)_2$). The experimental filtration results showed that salt rejection strongly depended upon the metal's pH and the membrane charge. Ion's rejection increased with an increase of applied pressure. The rejection gradually decreased when the feed concentration increased. It appeared that the valency and hydrated radius of ions had a dramatic effect on ionic specie's rejection. Experimental results demonstrated that increasing the complexity of solution decreased the rejection of metal ions.

Keywords: $\gamma\text{-Al}_2\text{O}_3$ membrane; Ultrafiltration; heavy metal; Charged membrane; wastewater treatment.

Reference

M. Breida, S. Alami Younssi, A. Bouazizi, B. Achiou, M. Ouammou, M. El Rhazi, *Nitrate removal from aqueous solution by $\gamma\text{-Al}_2\text{O}_3$ ultrafiltration membranes, Heliyon 2018*

acknowledgements: This work was supported by MESRSFC (Ministère de l'Enseignement Supérieur et de la Recherche Scientifique et de la Formation des cadres – Morocco) and CNRST (Centre National pour la Recherche Scientifique et Technique – Morocco) (Project number PPR/2015/72).

METAL OXIDE NANOPARTICLES FOR LATENT FINGERPRINT VISUALIZATION AND ANALYSIS OF SMALL DRUG MOLECULES USING SURFACE ASSISTED LASER DESORPTION/IONIZATION MASS SPECTROMETRY

Entesar Al-Hetlani*, **Mohamed O. Amin** and **Metwally Madkour**

Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait.

Herein, we explored different metal oxide nanoparticles (NPs) namely, ZnO, TiO₂, Fe₂O₃ and CeO₂ NPs for optical imaging and mass spectrometric determination of small drug molecules in latent fingerprints (LFPs). The optical imaging was achieved using a dry method by simply dusting the LFPs with a minute amount of the NPs powder and instant images were captured using a digital microscope and a smart phone camera. Whilst the mass spectrometric determination was obtained by using the NPs as a substrate for surface assisted laser desorption ionization (SALDI) technique, which enabled the detection of the small drug molecules without any interferences. The % error, SD and RSD were calculated and reported for the metal oxide NPs. Furthermore, Fe₂O₃ NPs exhibited the best SALDI spectra compared to the other metal oxide NPs used in this study in terms of the detected number of peaks and their intensities. The drug-spiked LFPs mass spectrum produced using the Fe₂O₃ NPs was compared with the spectrum obtained using the organic matrix under the same conditions. The findings showed that using NPs can boost the intensity of the detected signal and minimize the interferences commonly associated with the organic matrices resulting in unambiguous identification of small analytes. Therefore, metal oxides NPs can work as a substrate and an excellent alternative to the organic matrix for the analysis of small drug molecules present on the LFPs.

BASIC REQUIREMENTS OF A KINETICS STUDY

Jan Nisar

Gas-Phase Kinetics Research Laboratory, National Center of Excellence in Physical Chemistry,
University of Peshawar, Peshawar-25120, Pakistan
E-mail: pashkalawati@gmail.com

There are three basic requirements of a kinetics experiment i.e., method of activation, suitable medium for reaction to proceed and method of detection. As far as activation is concerned, this can normally be carried out by thermal, chemical, photo activation and electric discharge. For a reaction to proceed, a suitable medium is required. The choice of the media depends upon the temperature at which the reaction is expected to take place and as such water bath, oil bath and salt bath are normally used for reactions in the temperature range from room to 750K. For higher temperature region special techniques like shock tube and flash photolysis are used. Once the reaction has initiated then there is a dire need to determine the kinetic parameters and mechanism of reaction and this can be followed by a using a suitable detection technique. The last step in the kinetics study is to interpret the experimental results and compare it with theoretical results using RRKM calculation. If the results coincide with each other, then our experimental observations are supported by theories, otherwise we have to seek explanation for the same. Moreover, the advantages and reliability of one system over the other are discussed [1, 2, 3].

References

1. Nisar, J; Awan, I. A. *International Journal of Chemical Kinetics*, (2007) 39, 1-5.
2. Nisar, J; Awan, I. A. *Kinetics and Catalysis*, (2011) 52, 487- 492.
3. Nisar, J; Awan, I A; Iqbal, M; Khan, R. A; Shah, A; Razaq, R. *Chemical Physics Letters*, (2016) 661, 200–205.

ADVANCED FORENSIC ANALYTICAL TOOLS FOR THE DETERMINATION BLOOD ALCOHOL CONTENT

H.Marefi^a, A.Alhendal^b, A.Alshammri^c

Kuwait university, Chemistry department, Kuwait City, Al-khalidiya.

Kuwait university, Chemistry department, Kuwait City, Al-khalidiya.

Ministry of interior, General department of criminal evidence , Kuwait city, Al-Farwaniya

e-mail: alshammarianwar93@gmail.com

Presented in this paper, an example of the state-of-the-art analysis protocols used in forensic laboratories for the determination of alcohol content in blood. Real samples were collected from individuals held in custody for being suspect for driving under the influence alcohols. The protocols performed on blood samples from those individuals indicated that they were intoxicated with alcohols. The method and instrumental setup for the determination of blood alcohol concentration using modern gas chromatograph (Agilent 7890B GC coupled with dual FID detectors for enhanced quantitation of alcohol concentration present within a complex blood sample matrix. This study utilizes the J&W DB-BAC1 ultra inert and J&W DB-BAC2 ultra inert columns for the two-dimensional GC analysis of blood coupled with static headspace dual channel blood alcohol analyzer. In an overall evaluation for the method in use, good resolution highly sensitive and excellent reproducibility data were obtained and used in court of justice.

References

1. K.Lynam ,F.Droman, H. Boswell , Determine Blood Alcohol with Dual Column /Dual FID Precision and Reproducibility, Application note , Agilent Technologies , Inc. Publication number 5991-3671EN,2013.
2. J.L. Westland, F.L Dorman, Forensic Sci. Int.,231(2013),pp.50-56.

Acknowledgements: This work was funded by KU.

NOVEL MICROFLUIDICS AND NANO-DROPLETS MICROFLUIDIC METHODS FOR THE DETERMINATION OF TOTAL PHENOLIC CONTENT IN FOOD SAMPLES USING CHEMILUMINESCENCE DETECTION TECHNIQUES.

Haider A. J. AlLawati

Sultan Qaboos University, Box 36, Al-Khod 123, Oman email: haiderl@squ.edu.om

Phenolic compounds have received high interest in the past few years. This is because such compounds may reduce the risk of the development of several diseases due to their antioxidant power.

Several spectrophotometric methods for the quantification of total phenolic content (TPC) in plant-derived food have been reported. Some of the most commonly used assay methods for phenolic compounds include the modified vanillin test Price, the Prussian blue test and the Folin-Ciocalteu assay.

In general, the above mentioned methods have few limitations. For example results are not directly comparable, time consuming, laborious for large number of samples, poor selectivity for compounds absorb at the same wavelength, instability of phenolic compounds for long time analyses and interferences.

A number of chemiluminescence (CL) methods have been proposed as alternatives to standard methods for determining the total phenolic content. However, most of the CL methods are based on flow injection or sequential injection systems.

In this presentation, I will discuss novel microfluidics and nano-droplets based microfluidic - CL methods for the determination of TPC in food samples.

Microfluidic is a technique in which channels of sub-millimetre dimensions are etched on a solid substrate to perform various analytical steps such as sample preparation, mixing, reaction, analytical separation, detection, signal evaluation and quantification. The use of a miniaturized platform consumes minute amounts of chemicals and reduces the cost of analysis. Additionally, microfluidic methods reduce analysis time and increase sample throughput.

References:

- Al Lawati, H.A.J, Al Haddabi, B., Suliman, F.O., *Anal. Methods*, **2014**, *18*, 7243-7249.
Al Haddabi, B., Al Lawati, H.A.J, Suliman, F.O., *Talanta*, **2016**, *150*, 399 - 406.
Al Haddabi, B., Al Lawati, H.A.J, Suliman, F.O., *Food Chemistry*, **2017**, *214*, 670-677

Acknowledgements: This work was funded by His Majesty Trust Funds (SR/SCI/CHEM/2016/01)

ANALYTICAL FACILITIES DEVELOPED BY KISR TO SUPPORT THE ACTIVITIES OF THE STOCKHOLM CONVENTION REGIONAL CENTER FOR WEST ASIA

Hamidah Taqi, Karell Martínez Guijarro, Bondi Gevao, Hassan Alshemmari, Majed Al-Bahloul, Mariam Hajeyah

Environmental Pollution & Climate Program (EPCP), Environment & Life Sciences Research Center (ELSRC)

Kuwait Institute for Scientific Research (KISR)

E-mail: habdulah@kISR.edu.kw

Persistent organic pollutants (POPs) have been a subject of great concern because of their resistant to degradation and their potential to elicit adverse health effects in humans and living organisms. The Stockholm Convention (SC) on POPs is the global tool developed by the international community to deal with the threats and harmful effects caused by these contaminants. In 2009, Kuwait Institute for Scientific Research (KISR) was nominated as the SC West Asia Regional Center for POPs. Our institute has developed a state of the art facility for the analysis of these pollutants in the frame of the Government Initiative GI-P-KISR-06-13: Establishment of West Asia Regional Center for Persistent Organic Pollutants in Kuwait. Over the past years, several projects have been conducted in KISR related to the analysis and behavior of these chemicals in the environment.

General procedure for the analysis of POPs



References:

1. The Stockholm Convention on POPs. <http://chm.pops.int/TheConvention/Overview/TextoftheConvention/tabid/2232/Default.aspx>
2. K. Martínez-Guijarro, A. Ramadan, B. Gevao. Atmospheric Concentration of Polychlorinated Dibenzo-p-dioxins, Polychlorinated Dibenzofurans (PCDD/Fs) and Dioxin-like Polychlorinated Biphenyls (dl-PCBs) at Umm-Al-Aish Oil Field-Kuwait. *Chemosphere* 168:147-154 (2017)
3. B. Gevao, M. Bahloul, K. Martínez Guijarro, K. Kurunthachalam. Depositional Time Trends of Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans in a Dated Sediment Core from the Northern Arabian Gulf. *Marine Pollution Bulletin* 112(1-2):195-200-2016

Acknowledgements: Government Initiative P-KISR-06-13: Establishment of West Asia Regional Center for Persistent Organic Pollutants in Kuwait

MULTI-THERAPEUTIC COST EFFECTIVE BIO-CERAMIC NANOPARTICLES CONTAINING TRANSITION METALS FOR BIOMEDICAL APPLICATIONS

Mostafa Mabrouk^{a,*}, Shaimaa A. ElShebiney^b, Sayed H. Kenawy^a,
Gehan T. El-Bassyouni^a and Esmat MA Hamzawy^c

a) National Research Center, Ceramic Dpt., Dokki, Gizza, EGYPT.

Transition metal containing ceramic nanoparticles were prepared using wet precipitation method. The effect of transition metal concentration on the anticancer activity, drug delivering ability and *in vivo* tissue regeneration were assessed by different techniques. Furthermore, the safety of the prepared nanoparticles were also evaluated. The overall results recommend the utilizing of the fabricated nanoparticles as a multi-therapeutic agents in the field of nanomedicine.

THE EVALUATION CaCO_3 /POLYMER NANOCOMPOSITES PERFORMANCE FOR CONSOLIDATION AND PRESERVATION OF LIME STONE MONUMENTS.

Mohammad A. Al-Dosari¹, Sayed M. Ahmed², Sawsan S. Darwish³, Mahmoud A. Adam³, Nadia Al-Mouallimi⁴, Nagib A. Elmarzugi⁵

¹National Nanotechnology Research Center, King Abdulaziz City for Science and Technology (KACST), P.O.Box:6086, Riyadh, Saudi Arabia

²The grand Egyptian Museum, Ministry of antiquities, Cairo, Egypt, Email: sayedmansour32@yahoo.com

³Department of conservation, Faculty of Archaeology, Cairo University, Giza, P.O.Box:12613, Egypt.

⁴Saudi Nano Information Center, Jeddah P.O.Box:20718, Saudi Arabia.

⁵Faculty of Pharmacy, Tripoli University and BioNano Integration Research Group, Biotechnology Research Center, LARST, Tripoli, Libya, P.O.Box:13100 Email: nelmarzugi@gmail.com

Abstract

Historical stone surfaces and architectural heritage in Egypt are suffering from various environmental factors such as fluctuation of temperature/humidity, hazardous gases and microbes. Especially, the façades of the buildings are deteriorated with direct exposure by these factors; deformation and disfiguration of superficial decoration and formation of black crusts are often observed on the stones. The aim of this study is to evaluate the effectiveness of CaCO_3 nanoparticles as a consolidation and protection material for calcareous stone monuments, when those nanoparticles used dispersed in acrylic copolymer; polyethylmethacrylate (EMA)/methylacrylate (MA) (70/30 respectively).

The synthesis process of CaCO_3 nanoparticles/polymer nanocomposite has been prepared by in situ emulsion polymerization system. Some tests were performed in order to estimate the superficial consolidating and protective effect of the treatment. The obtained nanocomposites have been characterized by TEM, while the penetration depth, re-aggregating effects of the deposited phase and the surface morphology before and after treatment were examined by SEM. Improving of stone mechanical properties was evaluated by compressive strength tests. Change in water-interaction properties was evaluated by water absorption capillarity measurements, and colorimetric measurements were used to evaluate the optical appearance.

All the results get together with the apparent effect that CaCO_3 /polymer nanocomposite is an efficient material for the consolidation of artistic and architectural limestone monuments, completely compatible, enhanced the durability of limestone toward thermal aging and improved the stone mechanical properties compared to the samples treated with pure acrylic copolymer without Calcium carbonate nanoparticles.

Keywords:

Calcium Carbonate nanoparticles, consolidation, nanocomposites, Calcareous stone, TEM, Colorimetric measurements, compressive strength.

MANUFACTURE NANOMAGNETING FILTER

Sulaiman M. Alfadul

King Abdulaziz City for Science and Technology (KACST), Riyadh, Saudi Arabia

Email: sfadul@kacst.edu.sa

Magnetic filtration provides several advantages such as extremely rapid separations and remote operation that promotes safety and prevents health problems to workers. Since most of the pollutants in water are weakly magnetic or diamagnetic, they are not amenable to magnetic filtration. For this reason, magnetically-active extractants were synthesized that allow the separation of such species via magnetic filtration. Novel composite materials were synthesized by treating magnetite nanoparticles with amino silane reagents. The performance of the synthesized extractants was investigated for the removal of heavy metals (uranium and copper) from water. It was found that the resulting materials were highly effective for purifying water contains these toxic metal ions. In the case of magnetite nanoparticles coated with diaminosilane, the uranium uptake can be as high as 125 % by weight. We report here the synthesis of a novel nanocomposite magnetic extractant. Magnetic filtration provides several advantages such as extremely rapid separations and remote operation preventing safety and health problems to workers.

MANUFACTURING OF POLYMER NANO-COMPOSITES USING VACUUM INFUSION PROCESS

Abdulaziz N. Alyoubi and Mohammed Bassyouni*

Chemical Engineering Department, Faculty of Engineering, King Abdulaziz University, Rabigh, KSA

e-mail: Eng.Alyoubi@gmail.com

In recent years, there is a growing interest in synthesis of bio-composites based on biofibers such as jute, palm leaves, rice straw, sisal and flax because of their low cost, low density, high specific strength, renewability, and biodegradability. However, the level of adhesion with the nonpolar resin matrix leads to poor interfacial bonding at the matrix - fiber interface. Therefore, surface treatment methods of natural fibers have been attempted in the presence of functionalized carbon nanotubes. Carboxylic function group was used to improve the bonding at the interface. In this study epoxy- jute bio-composites and epoxy- Kevlar composites were synthesized. Multi-walled carbon nanotubes (MWCNTs) were added in the range 0.1 – 2.5%. Mechanical properties were measured using universal mechanical test. Surface morphology of the fracture surface was investigated. It is found that the mechanical properties have been dramatically improved in the presence of functionalized MWCNTs. Surface analysis showed better adhesive force.

DEVELOPMENT OF SILICA NANOPARTICLES CATALYST FOR ESTERIFICATION REACTIONS

A. Alkathiri^a, A. Alfawaz^a, A. Alswieleh^a, A. Alsalmeh^{a*}

^aChemistry Department, college of Science, King Saud University, Riyadh, Saudi Arabia.

*e-mail: aalsalme@ksu.edu.sa

Mesoporous silica nanoparticles (MSNs) are considered as an ideal support for heterogeneous catalysts[1]. In this study, MSNs has been prepared using cetyltrimethyl ammonium bromide (CTAB) as the template to produce materials with relatively high surface area ($\sim 1000 \text{ m}^2/\text{g}$), and pore size of $\sim 6.0 \text{ nm}$. The surface of MSNs has been functionalized with amine, thiol followed by thiol conversion into sulfonic acid. These materials have been characterized by a variety of physicochemical techniques, including FT-IR, elemental analysis, XPS, TGA, SEM, TEM and BET analysis. These catalysts exhibited excellent performance in the heterogeneous esterification of acetic acid with heptanol with 80% conversion in a 3 h reaction time.

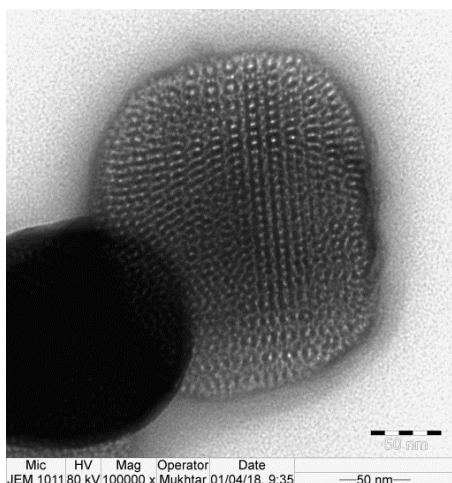


Figure 1: Transmission electron microscopy image of MSNs.

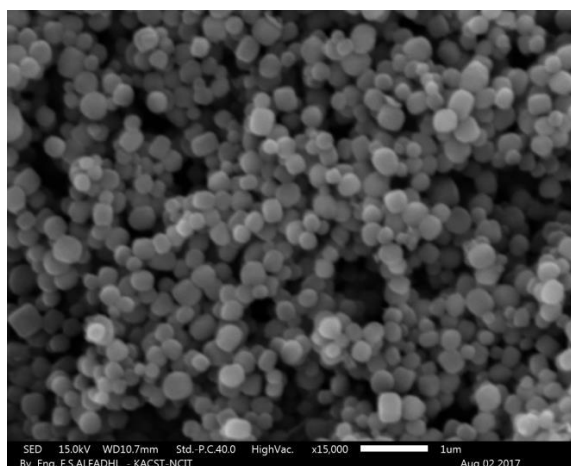


Figure 2: Scanning electron microscopy image of MSNs.

References :

- [1] Y. Huang, S. Xu, and V. S. Y. Lin, "Bifunctionalized mesoporous materials with site-separated Brønsted acids and bases: Catalyst for a two-step reaction sequence," *Angew. Chemie - Int. Ed.*, vol. 50, no. 3, pp. 661–664, 2011.

Acknowledgements: This work was funded by King Saud University.

GREEN SYNTHESIS OF PLATINUM NANOPARTICLES USING SAUDI'S DATES EXTRACT AND THEIR USAGE ON THE CANCER CELL TREATMENT

Najlaa S. Al-Radadi^a

*Taibah University, Najlaa S. Al-Radadi, Madinah Monawara, Saudi Arabia
e-mail: nsa@taibahu.edu.sa , nsor26@hotmail.com*

Green synthesis of the Platinum nanoparticle of dates is carried out for examining their effect on various cancer cells. The extract solution of Dates (biodegradable surfactant) is used for this purpose. The bio-degradable plant-based surfactant, used in the study, occurs naturally, and no other reducing, or capping agent is used for cancer cell treatment. The aqueous extract solution of popular dates Ajwa and Barni acts as a stabilizing and reducing agent during the production of PtNPs at ambient condition because of simplicity, long-time stability, and cost-effectiveness. In order to achieve the best size and shape of nanoparticles, different ratio of extract and metal salt were mixed and developed. Additionally, nanoparticles of varying size were furnished by altering the pH of the reaction. Spectroscopic techniques like FTIR, X-ray Diffraction (XRD), thermogravimetric analysis (TGA), UV-vis, and transmission electron microscopy (TEM) were applied to identify PtNPs. In this study, electrochemical HPCL and high-performance liquid chromatography (HPCL) are combined for better understanding and effectiveness. The metabolites such as amino acid, sugar, organic acid, flavonoids, phenol, and minerals, in the Dates produced in Al-Madinah Al-Munawarah, have been analyzed with the help of the techniques employed in the study. PtNPs' anticancer activities were evaluated for different cancer cells including the colon carcinoma cells (HCT-116), breast cells (MCF-7), and hepatocellular carcinoma (HePG-2). Commonly used effective anticancer agent, Doxorubicin HCl, is used in the current study related to anticancer activity. To discover the antibacterial effect, antibacterial agents Ampicillin and Gentamicin are used. Lastly, the Gram-negative bacteria: *Escherichia coli* (RCMB 010052) and Gram-Positive Bacteria: *Bacillus subtilis* (RCMB 010067) were used to determine the antibacterial application of PtNPs.

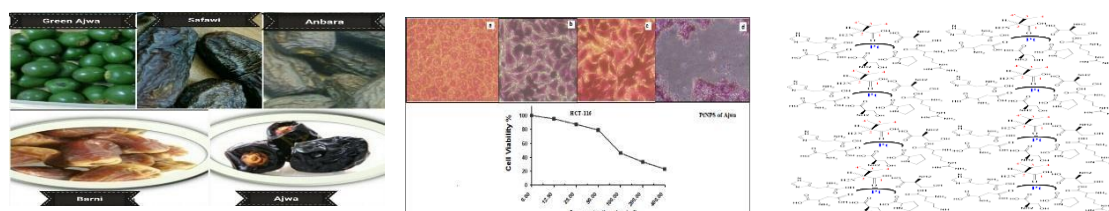


Figure 1. Types of AL-Madinah AL-Munawarah dates

Figure 2. The photo image of coloncarcinoma cells (HCT-116) treatment by PtNPs of Ajwa (a) HCT control (b) 50µg of PtNPs (c) 100µg of PtNPs (d) 400µg of PtNPs (e) Evaluation of cytotoxicity against (HCT-116) cell line

Scheme 1. Approximate structure of antioxidants in PtNPS with Barni and Ajwa Water Extract

References

1. M. M. H. Khalil, Y. M. Mostafa, and E. Torad, Biosynthesis and characterization of Pt and Au-Pt nanoparticles and their photocatalytic degradation of methylene blue, *International Journal of Advanced Research*. 2 (8) (2014) 694-703.

Acknowledgements: I am progressing to thank Saudi Patent Office at (KACST) on patent for "Green Synthesis of Platinum Nanoparticles Using Saudi's Dates Extract and their Usage on The Cancer Cell Treatment" in (15/6/2016) number (5422).

AN ECO-FRIENDLY SYNTHESIS OF SILVER AND GOLD NANOPARTICLES WITH BARNI FRUIT AND THEIR APPLICATIONS ON THE CANCER CELL TREATMENTS

Abeer N. Al-youbi and Nailaa S. Al-radadi*

Chemistry Department, Faculty of Science, Taibah University, Madina, KSA

Green synthesis of nanoparticles has been an exploring research topic in recent years due to their technology use in biological fields. Present work describes an ecofriendly method for the synthesis of silver and gold nanoparticles (Ag NPs , Au NPs) of Barni extract was done by using 2×10^{-2} M AgNO_3 and 1×10^{-3} M $\text{HAuCl}_4 \cdot 3\text{H}_2\text{O}$ with Barni extracts . Barni are common in Saudi Arabia and most cities in Al-Ahsa and Medina . The synthesized nanoparticles have been characterization by UV–Vis absorption spectroscopy showed peak at $\lambda_{\text{max}} = 450$ nm and 543 nm for silver and gold respectively , transmission electron microscopy (TEM), X-ray diffraction (XRD), and Fourier transform infrared spectroscopy (FTIR), thermo gravimetric analysis (TGA). The dates mediated synthesis of silver and gold nanoparticles is comparatively rapid , eco-friendly, less expensive and has large applications like antibacterial therapy in modern medicine. In vitro anticancer activity evaluation of the newly synthesized silver and gold nanoparticles were carried out against human cancer cell lines colon carcinoma cells (HCT-116), hepatocellular carcinoma (HePG-2) , breast cells (MCF-7) and human cervical cancer cell (HeLa).

POTENTIAL APPLICATIONS OF NANOTECHNOLOGY FOR OIL AND GAS FIELD DRILLING APPLICATIONS

Jothibasuramasamy

Saudi Aramco, KSA

E-mail: jothibasuramasamy@aramco.com

The energy demand of the global community has increased significantly over the last couple of decades and also expected to raise steeply in future. In order to meet the growing trend of energy demand, oil and gas companies are constantly shifting to high risk and extremely challenging drilling environments due to the low probability of finding sufficient hydrocarbon resources in simple, low risk and conventional geological environments. This is reflected by the expansion of drilling activities in complex geological areas, deep water environments, extreme-HPHT conditions, etc. The increasingly challenging operational environment makes the oil and gas exploration very risky and extremely costly due to various limitations current tools and equipment available for exploration and exploitation of oil and gas resources. This dictates the need to overcome the technical limitations of conventional tools by having reliable, chemically resistive and mechanically stable, short- and long-term fail-safe surface and subsurface tools and equipment. Nanotechnology has demonstrated that nanostructured materials with special mechanical, chemical, thermal, electrical and tribological properties can exhibit significantly higher strength, hardness, material toughness, corrosion resistance, ductility, elastic properties, thermal stability, and heat conductivity, etc., compared to conventional materials in spite of having the same chemical and material compositions. This paper describes the potential application of nanomaterials for mighty effect in the design and development of oil and gas field tools and equipment with superior physical, mechanical, thermal, electro-chemical, etc. properties to address challenges faced in the extreme drilling and production environments.

MESOPOROUS SILICA PREPARED BY MODIFIED TRUE LIQUID CRYSTAL TEMPLATING METHOD WITH HIGH THERMAL STABILITY AND 10-YEAR SHELF LIFE

Tariq Aqeel^a and Ali Bumajdad^b

^a Science Department, College of Basic Education, Public Authority of Applied Education and Training

(PAAET), P.O. Box 23167, Safat 13092, Kuwait.

^b Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait.

E mail: tm.aqeel@paaet.edu.kw

We prepared mesoporous silicon dioxide with high thermal stability via modified true liquid crystal templating (TLCT). The structure of this material could withstand multiple calcination processes at 570 °C for 104 h. The material is sturdy, and it has maintained the mesoporous structure for 10 years so far. Further, it has a high Brunauer-Emmett-Teller (BET) surface area (1280 m² g⁻¹), exceeding 1000 m² g⁻¹, which was the maximum surface area produced by the original TLCT method. The material was characterized by employing the N₂ sorption method, X-ray diffraction analysis, high-resolution transmission electron microscopy, X-ray photoelectron spectrometry, and ²⁹Si magic angle spinning-nuclear magnetic resonance analysis. The ²⁹Si MAS-NMR of the solid sample revealed that the Q⁴ value [Si(SiO)₄] increased in direct proportion to the heat treatment duration, indicating that the condensation process continued even after multiple heat treatments. This also means that our material not only is thermally stable but also continues to improve with multiple heat treatments. Therefore, our mesoporous material is promising for use as a host in nanoparticle/cluster gusset synthesis that requires heat treatments and as an absorbent of sulfur compounds in oil products.

Reference

Aqeel, T.; Bumajdad, A. *J. Porous. Mater.* **2017**, DOI:10.1007/s10934-107-0534-7

Acknowledgments: This project was funded by the Public Authority of Applied Education and Training (PAAET), Kuwait (Project No. BE-15-04 titled "Using Mesoporous Materials to Absorb Sulphur Compounds from Kuwaiti Petroleum Products") and was carried out in collaboration with Kuwait University. Assistance provided by Kuwait University for the XPS measurements (Project No. GS01/05), BET test (Project No. GS01/01), and Si²⁹ NMR spectroscopy (Project No. GS01/03) is acknowledged.

MORPHOLOGY CONTROL OF METAL OXIDE NANOSTRUCTURES

Mohammad R. Alenezi

PAAET, CTS, Department of Electronics Engineering Technology, Kuwait e-mail:
mr.alenezi@paaet.edu.kw

Low temperature hydrothermal synthesis of different ZnO nanostructures with rational control over their morphology and size is important for a wide range of sensing applications. ZnO nanostructures with different dimensionalities have been synthesized through low temperature hydrothermal techniques. One dimensional ZnO NWs have been synthesized with and without the assistance of a seed layer, with a higher degree of control over their structure, morphology, density and dimensions. The large-scale production of two dimensional ZnO nanodisks with a high fraction of exposed polar facets have also been produced through using zinc counter ions with preferential capping capabilities on defined facets. Furthermore, using a multi-stage hydrothermal synthesis, a range of three dimensional hierarchical ZnO nanostructures grown from initial mono-morphological ZnO nanostructures/seeds has been reported. The growth parameters, such as the nutrient concentration, quantity of polyethylenimine, growth time, and zinc counter ions have had a substantial impact on the morphological properties of the grown structures.

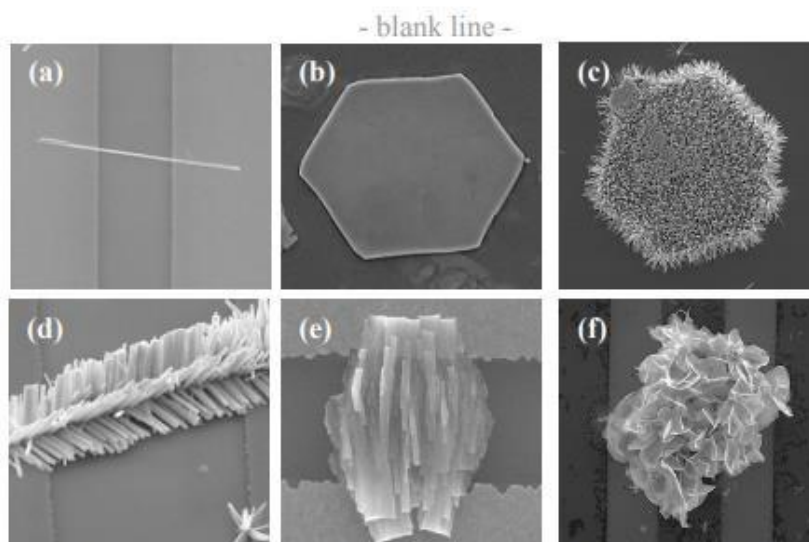


Figure 1 (a) Low magnification, (b) high magnification SEM image of a single ZNL; (c) low magnification, and (d) high magnification SEM image of single ZNL.

- blank line -

References

1. Alenezi, M. R.; Alshammari, A. S.; Jayawardena, K. D. G. I.; Beliatis, M. J.; Henley, S. J.; Silva, S. R. P. *J. Phys. Chem. C* 2013, 117, 17850–17858.
2. Alenezi, M. R.; Abdullah S. Alshammari, Peter D. Jarowski, Talal H. Alzanki, Simon J. Henley, and S. R. P. Silva. *Langmuir*, 2014, 30, 3913–3921.
3. Alenezi, M. R.; Henley, S. J.; Emerson, N. G.; Silva, S. R. P. *Nanoscale*, 2014, 6, 235–247.

- blank line -

Acknowledgements: This work was funded by PAAET.

PHYSICAL AND MECHANICAL CHARACTERIZATION OF CEMENT PASTE BLENDED WITH NATURAL VOLCANIC ASH, METAKAOLIN, AND NANO-SILICA/ALUMINA MIXTURES

Rehab Masmoudi¹, Ali Bumajdad¹, Kunal Kupwade-Patil²

¹*Kuwait University, Chemistry Department, P.O. Box 5969, Safat, Kuwait*

²*Laboratory for Infrastructure Science and Sustainability, Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, USA*

The design of durable cement paste was successfully achieved by a novel design that includes natural additives (volcanic ash and metakaolin) and synthetic additives (aluminosilicate nanoparticles (NPs)) harnessing the micro- and nano-additive effect. Aluminosilicate NPs were prepared by sol-gel method in which precursor was supported on aramid chain and finally recovered by heat at 550°C. Three compositions were developed by varying SiO₂-to-Al₂O₃ ratio. Characterization of the resulting NPs proved that they are amorphous which is an essential criteria for good pozzolanicity. According to N₂ sorptiometry, higher surface area was associated with higher SiO₂/Al₂O₃. TEM demonstrated higher tendency towards crystallization upon heating at lower SiO₂/Al₂O₃ ratio. In situ Raman study was performed on cementitious mixtures containing constant amounts of volcanic ash (two particlesizes; 17µm and 6µm), metakaolin, and 3 aluminosilicate NPs (2% replacement ratio only) at freshly hydrated state. The incorporation of metakaolin and aluminosilicate NPs resulted in great diversity in the evolved sulfate phases and evolution of alumina-based phases. Raman study also showed that higher SiO₂/Al₂O₃ is associated with higher consumption rate of portlandite. These combinations were also studied at hardened state (7 and 28 days curing) but with varying the replacement ratios of aluminosilicate NPs (0.25%, 0.5%, 1.0%, 2.0%) via examining the compressive strength. It was found that effect of reducing the particle size of volcanic ash was only significant after 28 days of curing. After 7 days of curing, higher SiO₂/Al₂O₃ ratio contributes to higher strength more significantly when incorporated with 17 µm volcanic ash, whereas it contributes to higher strength when incorporated with finer ash (6 µm) after 28 days curing. Our findings also showed that optimum replacement values of aluminosilicate NPs are within 0.5-1.0%, with highest compressive strength recorded for 1% replacement ratio with aluminosilicate NPs with lowest SiO₂/Al₂O₃ ratio after 28 days curing. The complex combinatorial effect of volcanic ash and aluminosilicate NPs resulted in a significant cement strengthening at certain proportions and compositions outlined.

REMOVAL OF PHENOLS FROM WASTEWATER USING 2D/3D PHOTOCATALYST

S. Al-Kandari^a, H. Al-Kandari^b, A. M. Abdullah^c, A. M. Mohamed^a

^a Chemistry Department, Kuwait University, P.O. Box 5969 Safat, 13060, Kuwait

^b Department of Health Environment, College of Health Sciences, PAAET, P.O. Box 1428, Faiha 72853, Kuwait

^c Center for Advanced Materials, Qatar University, Doha, P.O. Box 2713, Qatar.
alkandarish@yahoo.co.uk

Introduction

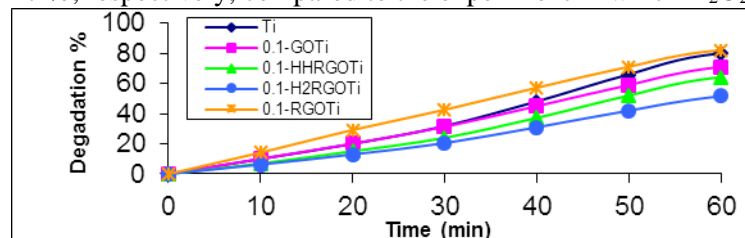
Phenolic compound among various organic contaminants can be found in wastewater require special attention because of their detrimental effect on human and environment. The traditional water treatment techniques, have not been successful in meeting the World Health Organization (WHO) standards. Therefore, new treatment approaches for phenolic compounds in wastewater based on advanced oxidation processes (AOPs) were developed which can achieve higher efficiencies than the currently used ones.

Experimental

Preparation of graphene oxide (GO) from graphite using modified Hummer's. All composites were characterized using surface and bulk techniques such as XPS, IR, Raman, XRD, optical properties. The reaction carried out using photocatalytic reaction and the product was analyzed using spectrophotometer.

Results and Discussion

From Figure below: a better phenol degradation was attained for RGOTi than for the commercial TiO₂. For example, 42.6 % and 71.1 % conversions were obtained after 30 min and 50 min UV illumination respectively in the presence of RGO with addition of H₂O₂ compared to 31.8 % and 66.0 % conversions in case of TiO₂ under same experimental conditions. Furthermore, In case of RGO at 30 and 60 min, phenol degradation rate is higher by 15 % and 27 %, respectively, compared to the experiment in which H₂O₂ was not added.



Kinetics of phenol degradation (20 mg L⁻¹) under 300 W UV illumination in the presence of (a) Ti, (b) GOTi, (c) H₂RGOTi, (d) HHRGOTi and (e) RGOTi catalysts. Approximately 70 μL of H₂O₂ was used with all catalysts.

Conclusion

XPS and all surface and bulk analytical techniques proves the formation of GO and RGO. Loading of carbon species on TiO₂ decrease band gap energy of TiO₂. The performance of 0.1-RGOTi is improved by addition of H₂O₂. Better phenol degradation was achieved using 0.1-RGOTi under UV light of 300 W with addition of H₂O₂. 0.1-RGOTi is good candidate in photocatalytic degradation of phenol in wastewater

References

1. Hummers, W. S. & Offeman, R. E. (1958) Preparation of Graphitic Oxide, *Journal of the American Chemical Society*, 80 (6), 1339-1339.
2. Akbal, F. & Nur Onar, A. (2003) Photocatalytic Degradation of Phenol, *Environmental Monitoring and Assessment*, 83 (3), 295-302

ALO_x NANO-CLUSTERS SYNTHESIZED VIA BONDED- AND UNBONDED-ARAMID-ALO_x COMPOSITE FILMS FOR REMOVAL OF ORGANIC DYE WASTE

Ali Bumajdad*, Shamsun Nahar, Fakhria Al Sagheer, Ahmed Abdel Nazeer
Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, State of Kuwait.
E-mail address: a.bumajdad@ku.edu.kw

A number of segmented copolymers were synthesized by reacting 1,4-phenyl diamine, 1,3-phenyl diamine, 2,4-diaminophenyl.2HCl, and teraphthaloylchloride in the presence of *N,N*-dimethylacetamide for fixing an aramid matrix. In this work, aluminium ethoxide (AEO) acted as precursor for composing organic- inorganic hybrid composite. Polycondensation reaction with different diamine conducted in solution-phase at low temperature and has successfully synthesized aluminum-containing aramids polymeric nanocomposite. Two types of aramid matrix were synthesized, bonded and unbonded. For bonded aramid, 3-(triethoxysilyl)propyl-isocyanate was used as binding agent for the preparation of hybrid films. The hybrid films were thermally degraded at different temperature (500° & 550°-1100°C) in presence of air as a dynamic atmosphere. From XR diffractometry analysis, the structure and the shape of the AlO_x nanoparticles were monitored at different temperature and found to be *amorphous, cubic, tetragonal or rhombohedral*. Field emission scanning and high resolution transmission electron microscope were used to scan the particle morphology and surface microstructure, respectively. Chemical composition and binding energy (B.E) of the synthesized nanoparticles was examined from XP spectra where the shift of binding energy has indicated the change of oxidation state of different AlO_x nanoparticles. Relatively high availability mesoporous surface (295-14m²/g) having average pore diameter in the range of 2-8 nm was confirmed by N₂ sorptiometry. Burned sample (at 500°C) was found to be amorphous and relatively of high surface area (295 m²/g) which is suitable for waste organic textile dye absorption. The AlO_x nanoparticles were tested for removal of cresol red (organic dye) and were able to uptake 60% of the dye.

Key words: amorphous AlO_x nanoparticles; mesoporous structure; aramid- alumina hybrid films; surface properties; dye absorption

**NANOPHOTOCATALYSTS WITH EFFICIENT FULL SOLAR ENERGY
HARVESTING VIA n-p DIRECT AND INDIRECT
NANOHETEROSTRUCTURES**

Metwally Madkour*, Mohamed O. Amin, and Entesar Al-Hetlani*

*Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait.
metwally.madkour@ku.edu.kw*

Harvesting the solar light with a full spectrum from UV to NIR regions would present real candidates as environmental pollutions tools. The idea of this work is to design a systematic nano heterostructures that are capable of harvesting the solar light with a full spectrum from UV to NIR. In our proposed system, n-type wide direct band gap CeO₂ NPs was coupled with n-type Ag₂S and p-type Cu₂S narrow indirect band gap. The choice of Ag₂S or Cu₂S was based on their capability of extending the photo response CeO₂ NPs to the NIR region and also due to their longer charge carrier life times compared to direct gap ones. The prepared nano heterostructures were fully characterized via XRD, XPS, BET, UV-Vis, PL, TEM and HRTEM techniques. Also the photocatalytic activities of the designed photocatalysts were tested toward the photodegradation of Rhodamine 6B dye under natural solar irradiation. The results obtained showed an extreme enhancement of the photodegradation rate in case of Cu₂S/CeO₂ and Ag₂S/CeO₂ compared to bare CeO₂ NPs.

Key words: Nanoheterostructures; Semiconductor; solar irradiation; photodegradation

HYDROPHOBIC CELLULOSE AEROGEL MODIFIED WITH NANO-TiO₂; SYNTHESIS, CHARACTERIZATION, AND CATALYTIC APPLICATION

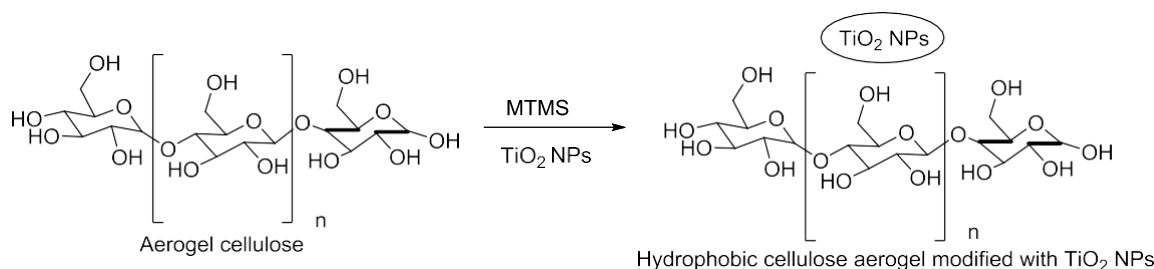
Mozhdeh Seyvedhamzeh^a, Sajjad Keshipour^b, Sahar Hamzehzad^b

^a Department of Electrical Engineering, Kuwait University, Kuwait. .

^bDepartment of Nanochemistry, Nanotechnology Research Centre, Urmia University, Urmia, Iran.
e-mail: m.hamzeh@ku.edu.kw

Today, attention to the environmental issues of a catalytic process is very important for the catalyst researcher that suppresses other reaction issues. Heterogeneous catalysts can be good tool for the reduction of environmental concerns in the catalytic reactions. Heterogenized catalysts with biocompatible supports increase the green aspect of the procedure. Cellulose as a support was used in the various catalytic reactions, and the results showed the high activity of cellulose supported catalysts [1- 4].

In this work, cellulose aerogel was modified with methyltrimethoxy silane (MTMS) for increasing the hydrophobic behavior of the cellulose aerogel. The obtained hydrophobic cellulose aerogel was used as a support for the TiO₂ nanoparticles. The prepared nanocomposite showed good catalytic activity in the oxidation reactions of organic substrates in water media.



Scheme. Preparation of the catalyst.

References (10 pt)

1. S. Keshipour, K. Adak, *RSC. Adv.* **2016**, 6, 89407.
2. S. Keshipour, K. Adak, *Appl. Organomet. Chem.* **2017**, DOI: 10.1002/aoc.3774.
3. S. Keshipour, N. Kalam Khalteh, *Appl. Organomet. Chem.* **2016**, 30, 653.
4. S. Keshipour, M. Khezerloo, *J. Iran. Chem. Soc.* **2017**, 14, 1107.

Acknowledgements: This work was funded by Urmia University.

SYNTHESIS, CHARACTERIZATION, AND CATALYTIC APPLICATION OF MICROCRYSTALLINE CELLULOSE MODIFIED WITH METALLOPHTHALOCYANINES

Mozhdeh Sevedhamzeh^a, Sajjad Keshipour^b, Rana Bahluli^b

^a Department of Electrical Engineering, Kuwait University, Kuwait.

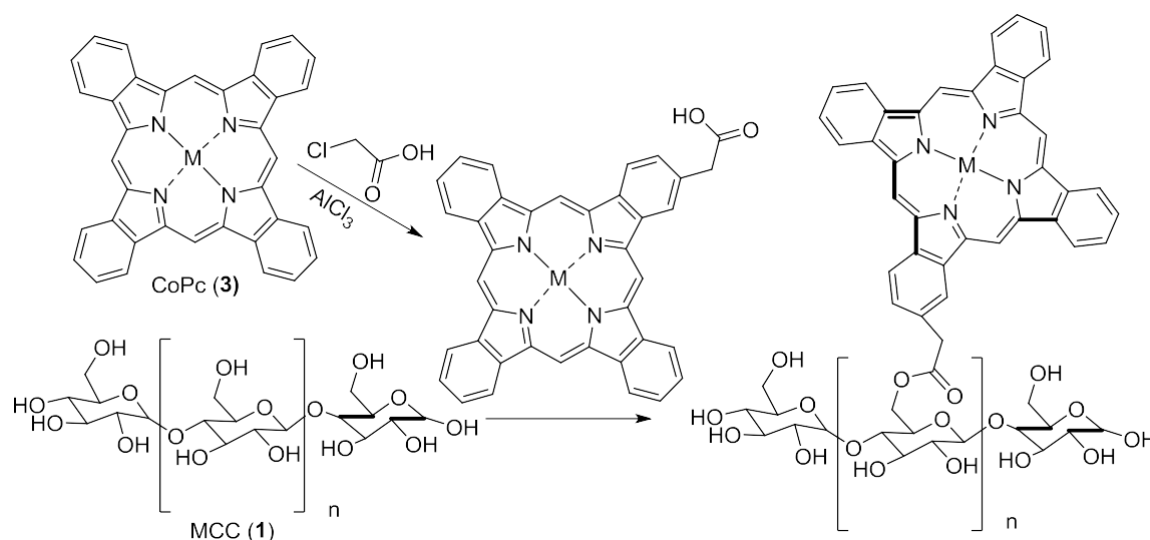
^b Department of Nanochemistry, Nanotechnology Research Centre, Urmia University, Urmia, Iran.

e-mail: m.hamzeh@ku.edu.kw

Metallophthalocyanines (MPc) are attractive oxidation catalysts because of their high activity, rather cheap and facile preparation in a large scale, and chemical and thermal stability. Recently, many efforts have been focused on the development of novel catalytic methods using MPc.

Heterogenized catalysts with biocompatible supports increase the green aspect of the procedure. Cellulose as a support was used in the various catalytic reactions, and the results showed the high activity of cellulose supported catalysts [1-4].

In this work, MPcs were immobilized on microcrystalline cellulose (MCC). The nanocomposite showed good catalytic activity in the oxidation of alcohols, ethylbenzene, and styrene. The catalyst showed good catalytic activity with high conversions. Oxidation of alcohols to the corresponding aldehydes or ketones, and oxidation of ethylbenzene and styrene to acetophenone were performed with high selectivities and good conversions.



Scheme. Preparation of catalyst.

References (10 pt)

1. S. Keshipour, K. Adak, *RSC. Adv.* **2016**, 6, 89407.
2. S. Keshipour, K. Adak, *Appl. Organomet. Chem.* **2017**, DOI: 10.1002/aoc.3774.
3. S. Keshipour, N. Kalam Khalteh, *Appl. Organomet. Chem.* **2016**, 30, 653.
4. S. Keshipour, M. Khezerloo, *J. Iran. Chem. Soc.* **2017**, 14, 1107.

Acknowledgements: This work was funded by Urmia University.

BIOSYNTHESIS OF IRON NANOPARTICLES USING PLANT EXTRACTS FOR PHOTOCATALYTIC METHYL ORANGE DYE DEGRADATION AND ANTIBACTERIAL APPLICATIONS

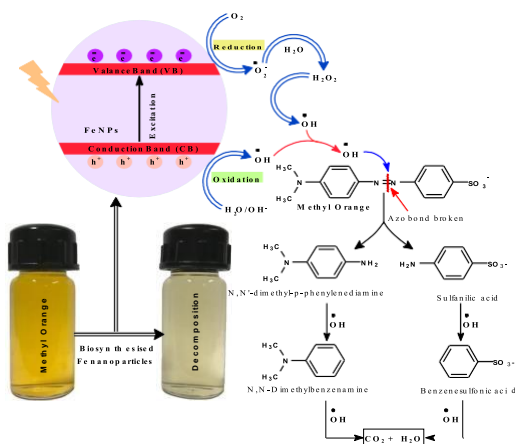
I. A. Radini^a, N. Hasan^{a*}, M. A. Malik^b, Z. Khan^b

^a Department Of Chemistry, Faculty of Science, Jazan University, P.O. Box 2097, Jazan, Saudi Arabia.

^b Department Of Chemistry, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia.

E-mail: hhasan@jazanu.edu.sa

In recent years pharmaceutical companies and many research papers are searching for alternative and efficient ways as toxic dyes degradation in water and antimicrobial agents. Nanoparticles (NPs) play an important alternative because of high surface to volume ratio for dye degradation and antimicrobial agent as it has potent antibacterial activity towards microorganisms and shows significantly higher synergistic effect with many antibiotics [1]. The distinctive problem NPs is the stability and shape which can be resolved by different capping agents. Plants are the great source of various biological and chemical constituents those have wide area of application especially in the treatment/prevention of diabetes and other chronic diseases like cancer [2]. The multiple biological and organic moieties in aqueous or organic phase of plant extract either are from flower or seeds carry soft reduction properties to reduce the metal cations into nanoparticles [3]. In our recent research work we implemented the plant extract in aqueous medium and successfully synthesized and stabilized zerovalent Fe nanoparticles (ZV-FeNPs). These nanoparticles were characterized by UV-visible spectrometry, XRD, TEM, EDX, FTIR and TGA/DSC. Further ZV-FeNPs were used for the toxic dye degradation under UV light irradiation and applied as antibacterial activities. Respective reliable mechanisms we demonstrated after application of ZV-FeNPs.



References

- Hasan, N., Guo, Z., Wu H.F., Anal Bioanal Chem. **2016**, 408 (23), 6269-6281.
- Vígh S., Zsvér-Vadas Z., Pribac C. et al. Vasile Goldis University Press, **2016**, 26 (4) 435-448.
- Alshehri A., Malik M. A., et al. RSC Adv., **2017**, 7, 25149-25159.

Acknowledgements: This work is funded by Deanship of Scientific Research (DSR) Jazan University with the reference No. JUP7//00084.

WATER TRANSPORT AND DESALINATION THROUGH DOUBLE-LAYER GRAPHYNE MEMBRANES

Seifollah Jalili^{a,b,c}, Mojdeh Akhavan^c and Jeremy Schofield^a

^a*Chemical Physics Theory Group, Department of Chemistry, University of Toronto, 80 Saint George Street, Toronto, Ontario, Canada, M5S 3H6*

^b*Department of Chemistry, K. N. Toosi University of Technology, P. O. Box 15875-4416, Tehran, Iran*

^c*School of Nano-Science, Institute for Research in Fundamental Sciences (IPM), P.O. Box 19395-5531, Tehran, Iran*

Non-equilibrium molecular dynamics simulations of water-salt solutions driven through single and double-layer graphyne membranes by a pressure differential created by rigid pistons are carried out to determine the relative performance of the membranes as filters in a reverse osmosis desalination process. The simulations indicate that the graphyne membranes have a high permeability and efficiently filter salt ions. Different morphologies of graphyne membranes exhibit variable filtration rates, and it is found that the flow rate of water through a graphyne-4 membrane is twice that of a graphyne-3 membrane for both single and double-layer membranes. Although the addition of a second layer to a single-layer membrane reduces the membrane permeability, the estimated permeabilities of double-layer graphyne membranes are still two or three orders of magnitude greater than those of commercial reverse osmosis membranes. The minimum reduction in flow rate in double-layer membranes occurs at a layer spacing of 0.35 nm with an AA stacking configuration, while at a spacing of 0.6 nm the flow rate is close to zero due to a high free energy barrier for permeation due to the energetic penalty of breaking multiple hydrogen bonds. All membranes are demonstrated to have a high salt rejection fraction and the hydration number profiles suggest that the double-layered graphyne-4 membranes can further increase the salt rejection by trapping ions that have passed through the first membrane from the feed solution in the interlayer space.

Keywords: Reverse osmosis; Water flow; Non-equilibrium molecular dynamics; Salt rejection; Desalination.

References

- [1] J.R. Werber, A. Deshmukh, M. Elimelech, The critical need for increased selectivity, not increased water permeability, for desalination membranes, *Environ. Sci. Technol. Lett.* 3 (2016) 112–120.
- [2] J.R. Werber, C.O. Osuji, M. Elimelech, Materials for next-generation desalination and water purification membranes, *Nat. Rev. Mater.* 1 (2016) 16018, <http://dx.doi.org/10.1038/natrevmats.2016.18>.
- [3] S. Daer, J. Kharraz, A. Giwa, S.W. Hasan, Recent applications of nanomaterials in water desalination: A critical review and future opportunities, *Desalination* 367 (2015) 37–48.

A STUDY OF SOME TRACE ELEMENTS IN SAMPLES OF CUTTING ROCKS AND CRUDE OIL FOR THREE WELLS IN MISAN OIL FIELDS

Sajed Hussien Gzar, Mohammed Turki

Department of Chemistry, Collage of Science, University of Thi-Qar.

Email: Dr.mohammedturki@yahoo.com

This study is aim to benefit from the remnants of adsorbed metals and their complexes on the rocks when crude oil migration and passage of those rocks. We studied a number of trace elements in crude oil and cutting rocks (samples were obtained of cutting rocks at depths 250, 500, 750, 1000, down to the oil reservoir) appreciation where crude oil samples prepared to examine by means of dry ashing, while the samples of cutting rocks have been used of nitric and perchloric acids concentrated and then using hydrochloric acid. The concertation's ranges of trace elements in the soil Cr(9.85-1.00ppm), Fe(109.70-82.56ppm), Mg(1.49-1.10ppm), Cd(0.390-0.022ppm), Zn(7.68-0.16ppm), V(499.83-66.42ppm), Ni(78.33-4.17ppm), Cu(1.809-0.023ppm), Co(1.818-0.043ppm) and Pb(2.895-0.041ppm), while the concentrations of these elements in crude oil are Cr(9.714ppm), Fe(115ppm), Mg(2.869ppm), Cd(0.528ppm), Zn(8.789ppm), V(528ppm), Ni(105ppm), Cu(1.042ppm), Co(3.117ppm) and Pb(3.291ppm). The measurement using atomic absorption spectrometry. we found that the concentration of the studied elements Cr, Fe, Mg, Cd, Zn, V, Ni, Cu and Co increases with depth and be concentrated highest in the crude oil than in the cutting rocks in the case of the two product wells but exploratory well didn't show the increase with depth, but it was distributing concentrations an irregular basis, thus can take advantage of these elements in the exploration of reservoirs of crude oil, while lead steady increase in the concentration did not appear with increased drilling depth in the three studied wells.

Keywords: Crude oil, cutting rocks, trace elements, reservoirs.

GREEN SYNTHESIS OF IRON NANOPARTICLES (FeNPS) AND NOVAL APPLICATIONS, THEIR ROLE AS CO-FACTOR IN POULTRY FEED

**Mukhtar ul Hassan^{1,2}, Muhammad Zahid Qureshi³ and Shazia Seema³,
Mudsar Natt¹**

*¹West London College UK, ²Armed Forces Hospital KSA, ³Govt.College University Lahore
mukhtar.hassan@gmail.com*

The prime inspiration for present research work was that the poultry feed contains growth factors that are dangerous for the consumer. Iron is a non toxic element and may act as a co-factor for the enhanced growth of the poultry. Iron nanoparticles were synthesised by green rout using banana peel extract as reducing and capping agent. This green synthesis of Iron nanoparticles was cost effective, easy and envirnment friendly. Synthesis of Iron nanoparticles was confirmed by colour change (yellow to black). Iron nanoparticles were then characterized by UV- vis spectroscopy, zeta sizer, X-ray diffraction and scanning electron microscopy. Synthesized iron nanoparticles were nontoxic, stable, spherical in shape and had size below 50 nm. Ironnanoparticles were then dried after 30 mins centrifugation at 8000 revolutions permins to obtain black powder. Dried nanoparticles were supplemented in four groups of chicks in different quantities along with basal diet for the period of six weeks continuously. Weight of the chicks was recorted every week. Per week body weight gain and over all body weight gain was also calculated. Supplemented Iron nanoparticles enhanced the growth of the chicks in all quantities in all groups. Therefore, Iron nanoparticles can definitely act as cofactor for poultry feed.

BIVALVE SHELL CHEMISTRY AS PROXIES OF METAL POLLUTION: A CASE STUDY FROM PARTS OF SOUTH ANDHRA COAST, EAST COAST OF INDIA.

Javaraju

Yogi Vemana University, India

Bivalved shell samples were obtained from five locations along Nizampattanam-Lankavanidibba and Tupilipalem beaches, Andhra Pradesh, East coast of India. The shell powder was analyzed for heavy metal contaminants such as Pb, Fe, Cu, Mn, Cr, Zn, Co, Cd, Ni, by using ICP-OES. The Measured heavy Metals Concentrations in the (bivalved shells) Molluscan shells were found to be in the range of Pb, <0.01- 1.90ppm; Zn, 1.66-6.81ppm; Mn, 5.42-6.86ppm; Ni, Co, and Cd is <0.01ppm, Fe 8.69-123.21ppm, Cu, 0.12-8.07ppm, Cr, 1.99-3.87ppm, the average percentage of metal concentration were Pb, 2.61%, Zn ,3.04% ,Mn , 6.28% ,Ni , <0.01% ,Fe, <95.09% ,Co, Cd , <0.01%,Cu, 2.59%,Cr, 2.68%. The elemental distribution from higher to lower (level) content in the study area is 95.09>6.28>3.04>2.68>2.61>2.59Fe>Mn>Zn>Cr>Pb>Cu>Ni>Co>Cd. There is no significant Correlation among most of these metals indicating different anthropogenic and natural sources to asses ecotoxic potential in shells and marine ecosystem. The most abundant metal detected was iron. Enrichment Factor (EF) of the heavy metal contaminants in the powdered samples were calculated, indicating significant enrichment of the shells at some locations due to anthropogenic activities. The geo-accumulation Index (Igeo) shows no contamination to moderate contamination range. Shell elemental compositions as given are difficult to interpret. Differences in shell elemental abundances in mussels exposed to acidified seawater at experimental sites compared to normal conditions at control site are difficult to interpret. First order elemental differences are related to crystallographical differences between calcite and aragonite. Nevertheless, the spatial differences in Ca, Mg, Na and P elemental composition within one shell layer are highly complex and probably meaningful on the level of metabolic controls during biomineralization. However, the shell chemistry has become an inexpensive tool to monitor the marine pollution. Further work is in progress.

Key words: Bivalve shells, heavy metals, Enrichment factor, geo-accumulation index

ELECTRO-OXIDATION MECHANISM AND SENSITIVE DETECTION OF ESCITALOPRAM OXALATE IN HUMAN PLASMA SAMPLES AND FORMULATION USING CARBON PASTE ELECTRODE MODIFIED WITH NATURAL SODIUM MONTMORILLONITE CLAY

Amira M. Hassanein, Youssef I. Moharram*, Naglaa F. Oraiby, Sherif E. Ebied*

Analytical and Electrochemistry Research Unit, Department of Chemistry, Faculty of Science, Tanta University, 31527- Tanta, Egypt

The electrochemical behavior of Escitalopram Oxalate (ESCIT.Oxalate) at a carbon paste electrode (CPE) modified with natural sodium montmorillonite clay (Na-MMT/CPE) was achieved by cyclic voltammetry and a mechanism of its oxidation was reported and illustrated. Carbon paste electrode modified with natural sodium montmorillonite clay (Na-MMT/CPE) was used as a sensor for sensitive and selective determination of ESCIT.Oxalate drug using cyclic voltammetry (CV) and square-wave adsorptive stripping voltammetry (SW-AdASV). Unmodified CPE as well as the modified one were characterized using scan electron microscopy (SEM), N₂ sorption isotherms (BET) and electrochemical impedance spectra (EIS). In spite of the very low conductivity of Na-MMT, a shift in the peak potential to less positive and about two times enhancement in the peak current were observed at 7% (w/w) Na-MMT/CPE compared to that at bare CPE, reflecting electrocatalytic activity of Na-MMT towards oxidation of ESCIT.Oxalate. This may be attributed to strong adsorptive property of Na-MMT due to its high surface area or specific bonding reactions of ESCIT.Oxalate with the functional groups at the edges of clay sheets. The method was employed successfully to determine ESCIT.Oxalate in its pharmaceutical formulation (Ciprale[®] tablets). Detection limit of 3.03×10^{-9} M was also achieved in human serum. The described method is reliable, simple and sensitive enough for assay of ESCIT.Oxalate in real plasma samples, pharmacokinetic studies, quality control and assurance of the drug in industry and in clinical laboratories.

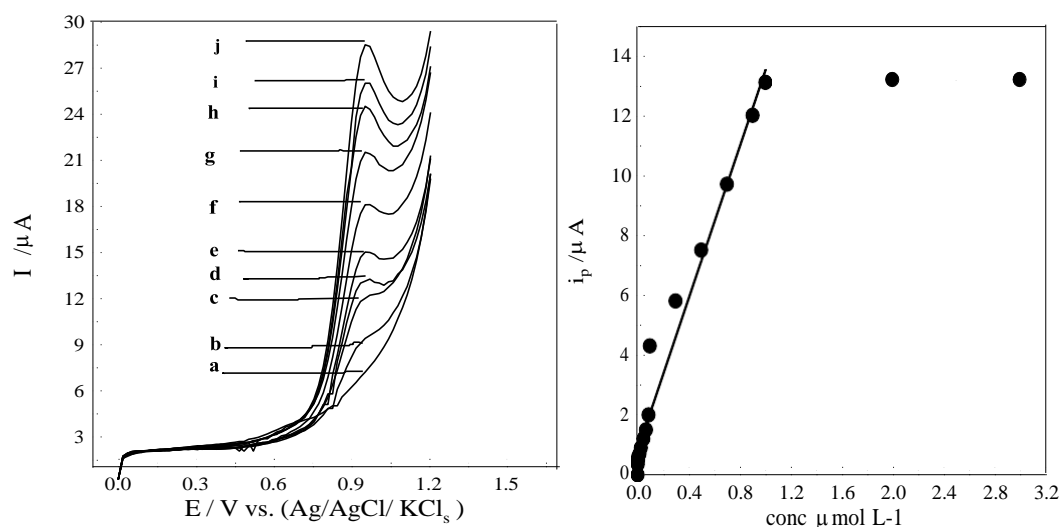


Figure 1. SW-AdAS voltammograms recorded in the B-R buffer of pH 9.0 for various concentrations of ESCIT.Oxalate in bulk form onto the 7% (w/w) Na-MMT/CPE and its calibration plot ($E_{acc} = 0.0$ V, $t_{acc} = 40$ s, $f = 120$ Hz, $\Delta E_s = 18$ mV and $a = 25$ mV).

SOLVENT EFFECT ON THE SPECTROSCOPIC PROPERTIES OF SOME LASER COMPOUNDS AND ENERGY TRANSFER PROCESSES

N. Abass Ali Al-Tememe^a, B. Touma Al kafajy^b, F. Jwad Kahdim^c, N. Zuheir Habeeb^d

^{a,b,c,d}University of Baghdad, College of Science, Baghdad, Iraq.
e-mail: nathera_2007@yahoo.com

Abstract: This paper contains recent progress and the authors work in the field of solvation effects on spectroscopic properties of some organic compound like Coumarin 334 of a chemical formula $C_{17}H_{17}NO_3$, and Rhodamine 590 of molecular formula ($C_{28}H_{31}N_2O_3Cl$) as in Figure 1. . For many aromatic molecules the position and the structure of the fluorescence spectrum are strongly dependent on the solvent. The wavelength displacement can often be correlated with changes in solvent dielectric constant and the solvent index of refraction. A general review for the effect of the solvent is presented including studying the relationship between energy transfer processes and quantum efficiency with different solvent types.

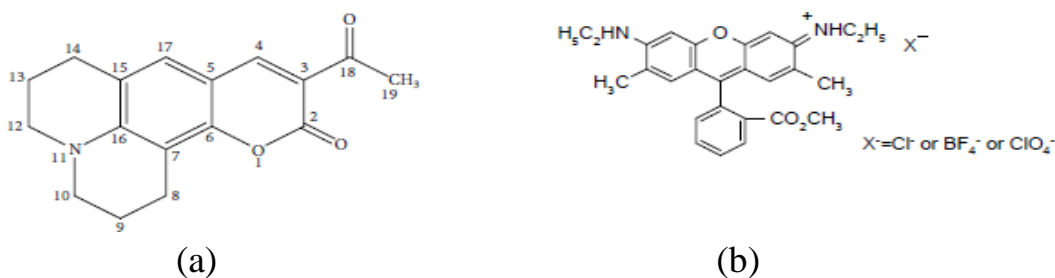


Figure 1. a- Structure of Coumarin 334. b- Structure of Rhodamine 590

References

8. Bayliss, N., *J. Chem. phys.* **1950**, 18, 292-297.
9. Ooshika, Y. *J. Phys. Soc. Jpn.* **1954**, 9, 594-602.
10. Rae, E., *J. Phys. Chem.* **1957**, 61, 562-572.

Acknowledgements: This work was funded by laboratories of Laser in physical department and college of science and University of Baghdad

DEVELOPMENT OF A NEW POLYPYRROLE ULTRAFILTRATION MEMBRANE ON FLAT POZZOLAN SUPPORT FOR REMOVAL OF CONGO RED FROM AQUEOUS SOLUTIONS

**Ghizlane Derouich, Saad Alami Younssi, Brahim Achiou, Jamal Bennazha, M.
El Rhazi**

*Laboratory of Materials, Membranes and Environment, Faculty of Sciences and Technologies,
University Hassan II of Casablanca, Morocco.
e-mail: alamiyounssisaad@yahoo.fr*

The main objective of this work is the development of a new ultrafiltration membrane based on polypyrrole polymer for filtration of dyes such as the Congo Red. The support used is a flat support made from Moroccan natural pozzolan. The choice of this material is mainly due to its low cost, its abundance, and its thermal and chemical resistance. The chemical analysis of the pozzolan shows that it is siliceous and aluminous material with a $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio of 2.9. The support has an average pore diameter of $2.84 \mu\text{m}$, a porosity of 32.4% and a water permeability equal to $1424 \text{ L/m}^2\cdot\text{h}\cdot\text{bar}$ [1].

The polypyrrole membrane was prepared using layer-by-layer coating method. A thin layer of polypyrrole was synthesized on the plane support by the chemical polymerization of pyrrole. Polypyrrole was prepared using the pyrrole solution (0.05M) and FeCl_3 (0.1M) as oxidizing agent. This preparation was kept unagitated for 24 h to achieve decantation of polypyrrole powder [2].

The morphology of polypyrrole layer was investigated using the Scanning Electron Microscopy (SEM) and showed that elaborated membrane has a typically cauliflower-like. The water permeability of polypyrrole membrane is equal to $62 \text{ L/m}^2\cdot\text{h}\cdot\text{bar}$. Comparing the results of support with polypyrrole membrane, the water permeability is reduced 22 times. In addition, the filtration of Congo red by polypyrrole membrane was conducted, taking into account the influence of pressure (1-3 bar), solution pH (4-10) and initial dye concentration (10-600 ppm). This study proves that low-cost polypyrrole membrane can remove up to 90% of Congo red dye. Therefore, the polypyrrole membrane could be recommended for the filtration of industrial textile effluent.

Keywords: Natural pozzolan, Polypyrrole, Composite membrane, Ultrafiltration, Congo Red

References

- 1 B. Achiou, H. Elomari, M. Ouammou, A. Albizane, J. Bennazha, S.A. Younssi, I.E. El Amrani, A. Aaddane, Elaboration and characterization of flat ceramic microfiltration membrane made from natural Moroccan pozzolan (Central Middle Atlas), *J Mater Env. Sci* **2016**, (7) 196–204.
- 2 Hemant K. Chitte, Narendra V. Bhat, Vasant E. Walunj, Ganesh N. Shinde, Synthesis of Polypyrrole Using Ferric Chloride (FeCl_3) as Oxidant Together with Some Dopants for Use in Gas Sensors, *J Sens Technol.* **2011**, (1) 47-56.

acknowledgements: This work was supported by MESRSFC (Ministère de l'Enseignement Supérieur et de la Recherche Scientifique et de la Formation des cadres – Morocco) and CNRST (Centre National pour la Recherche Scientifique et Technique – Morocco) (Project number PPR/2015/72).

Schiff Base Ligand Incorporated Nanocomposite Sorbent For Optical Copper(II) Ions Removal From Aqueous Solutions

Zeid A. Alothman^a

^a *Advanced Materials Research Chair, Department of Chemistry, King Saud University, P. O. Box 2455, Riyadh 11451, Saudi Arabia*

Copper ions (Cu(II)) are an essential element in living organisms and play an important role in body functions, while an excess intake of Cu(II) ion is adversely affected and associated with a number of diseases [1,2]. A novel Schiff base ligand based nanocomposite adsorbent was prepared for the detection and removal of copper (Cu(II)) ions in wastewater samples. Upon the addition of Cu(II) ions to nanocomposite adsorbent at optimum conditions, the clear color was visible to the naked-eye in the detection system. This nano-composite adsorbent exhibited an obvious color change from yellowish to dark green in the presence of Cu(II) ions in aqueous solution. The limit of detection was found to be 0.16 µg/L by optical detection. The nano-composite adsorbent could detect the Cu(II) ions over other foreign ions with high sensitivity and selectivity. For adsorption behaviour, influences several factors such as solution pH, contact time, concentration for Cu(II) ion adsorption was investigated by batch experiment in detail. The results showed that neutral solution pH was suitable to get optimum Cu(II) ions adsorption. Also an extending contact time was favourable for improving adsorption efficiency. The adsorption process of Cu(II) ions by the nanocomposite adsorbent was followed the Langmuir adsorption isotherm model. The maximum adsorption capacity of Cu(II) ions by the NCA from the Langmuir isotherm model was 173.62 mg/g. The mesoporous adsorbent exhibited higher adsorption capacity compared with some other reported diverse materials. In the multi-component system, the competing ions did not significantly interfere in the adsorption of Cu(II) ions. The adsorbed Cu(II) ions was effectively eluted with 0.25M HCl and remain the almost same functionality for many cycles use. Even in seven consecutive cycles, the adsorbent showed great potential in the optical Cu(II) ions removal from wastewater. The proposed nano-composite adsorbent also could be used a promising adsorbent for the clean-up of Cu(II) ions in wastewater treatment.

References

1. Gaggelli, E., Kozłowski, H., Valensin, D., Valensin G. *Chem. Rev.* **2006**, *106*, 1995-2044.
2. Wan, H., Sun, Q., Li, H., Sun, F., Hu, N., Wang, P. *Sens. Actuators, B*, **2015**, *209*, 336-342.

Acknowledgements: The authors also extended their appreciation to the Deanship of Scientific Research at King Saud University for funding the work.

ENVIRONMENTALLY-SAFE SYNTHESIS OF GOLD AND SILVER NANO-PARTICLES WITH AL-MADINAH BARNI FRUIT AND THEIR APPLICATIONS IN THE CANCER CELL TREATMENTS

Nailaa S. Al-Radadi*¹, Abeer N. Al-youbi¹

¹ *Chemistry Department, Faculty of Science, Taibah University, Madinah Monawara, Saudi Arabia
E-mail address: nsor26@hotmail.com, nsor2644@yahoo.com, nsa@taibau.edu.sa*

Green synthesis of nano-particles has been an exploring research topic in recent years due to their technology use in biological fields. Present work describes an eco-friendly method for the synthesis of silver and gold nano-particles (Ag NPs, Au NPs) of Barni extract was performed by using 2×10^{-2} M AgNO₃ and 1×10^{-3} M H₂AuCl₄·3H₂O with Barni extracts. Barni date are common in Saudi Arabia and most of the cities in Al-Ahsa and Medina. The synthesised nano-particles have been characterised by UV-Vis spectroscopy and the absorption spectroscopy showed a peak at $\lambda_{\max} = 450$ nm and 543 nm for silver and gold respectively, Transmission Electron Microscopy (TEM), X-Ray Diffraction (XRD), EDX and Fourier Transform Infrared Spectroscopy (FTIR), Thermo Gravimetric Analysis (TGA). The dates mediated synthesis of silver and gold nano-particles are comparatively rapid, eco- friendly, less expensive, and they have several applications like in anti-bacterialtherapy in modern medicine. In the vitro anti-cancer activity, evaluation of the newly synthesised silver and gold nano-particles was carried out against human cancer cell lines colon carcinoma cells (HCT-116), hepatocellular carcinoma (HePG-2), breast cells (MCF-7), and human cervical cancer cell (HeLa).

Keywords

Antioxidant activity, Bio-synthesis, Anti-cancer activity, Barni extract, and Protein

TRENDS IN NANOTECHNOLOGY: STATE OF THE ART

Abdulwahab S Almusallam, Bini TB

Chemical Engineering Department, Kuwait University, P.O.Box 5969, Safat 13060, Kuwait.

e-mail : abdulwahab.almusallam@ku.edu.kw

As small as a nanometer is, it's still large compared to the atomic scale. An atom has a diameter of about 0.1nm and its nucleus is much smaller about 0.00001nm. Nature has perfected the science of manufacturing matter molecularly. Cells are nature's nanomachines. At the atomic scale, elements are at their most basic level. On the nanoscale, we can potentially put these atoms together to make almost anything. In the past few years, nanotechnology has grown in leaps and bounds and has found many applications in our day to day life. Few of the important trends in nanotechnology is presented to focus on the state of the art. Nanotechnology has impacted in almost every field of science and technology. A nanoparticle or nanorobot may be designed to search for, find and destroy a single diseased cell. It also finds potential for targeted drug delivery system. In food and process engineering, double emulsions where the core of oil droplets of and oil-in-water emulsion is replaced by water. This could result in a mayonnaise that tastes and feels like the full fat kind but contains much less calories. Carbon nanobelts are expected to serve as a useful template for building carbon nanotubes and open a new field of nanocarbon science. A vitamin pill-sized camera that could travel through our body taking pictures, helping diagnose a problem. In the textile industry, nanoparticles can be used to provide a "lotus plant" effect which causes dirt to rinse off easily, such as in the rain. Nano-sized sensors are useful in oil and gas companies to squeeze more hydrocarbons out of the ground. Magneto-rheological fluids which become solid under magnetic field are finding use in clutches and tunable shock absorbers. The developments in nanotechnology is unlimited and according to most experts, nanotechnology will be the key technology of the 21st century.

**BIODEGRADABLE POLYLACTIDE-BASED FILMS INCORPORATED
WITH BIMETALLIC Ag-Cu NANOPARTICLES AND ESSENTIAL OIL FOR
FOOD PACKAGING APPLICATIONS**

Yasir Ali Arfat* and Jasim Ahmed

Environment & Life Sciences Research Center, Kuwait Institute for Scientific Research,

P.O. Box 24885, Safat-13109, Kuwait

E-mail: yasir.arfat123@gmail.com; yarfat@kisr.edu.kw

Plasticized polylactide (PLA) composite films with multifunctional end-use properties were prepared by loading bimetallic silver-copper (Ag-Cu) nanoparticles (NPs) and cinnamon essential oil (CEO) into polymer matrix via compression molding technique. Rheological, thermal, barrier, structural and antimicrobial properties of the composite films and its utilization in the packaging of chicken meat were investigated. PLA/PEG/Ag-Cu/CEO composites showed a very complex rheological system where both plasticizing and antiplasticizing effects were evident. Thermal properties of plasticized PLA film enhanced considerably with the reinforcement of NPs whereas loading of CEO decreased glass transition, melting and crystallization temperature. Barrier properties of films decreased with the increase of CEO loading ($P < 0.05$). Color, transparency, and anti-UV properties of PLA films were markedly influenced by the incorporation of both Ag-Cu NPs and CEO. FTIR spectra exhibited changes in the molecular organization of PLA composite films. Scanning electron microscopy (SEM) revealed the rough and porous surface of the composite films. The effectiveness of composite films was tested against *Salmonella* Typhimurium, *Campylobacter jejuni* and *Listeria monocytogenes* inoculated in chicken samples, and it was found that the films loaded with Ag-Cu NPs and 50% CEO showed maximum antibacterial activity during 21 days storage at the refrigerated condition. This information could be useful for the commercial development of plasticized PLA/Ag-Cu/CEO composite films, and their possible applications in active food packaging.

ZINC OXIDE NANORODS/CLOVE ESSENTIAL OIL INCORPORATED TYPE B GELATIN COMPOSITE FILMS AND ITS APPLICABILITY FOR SHRIMP PACKAGING

Mohammed Ejaz*, Jasim Ahmed, Yasir Ali Arfat and Mehrajfatema Mulla

Food and Nutrition Program, Environment & Life Sciences Research Center

Kuwait Institute for Scientific Research, P.O. Box 24885

Safat-13109, Kuwait

E-mail: mejaz@kISR.edu.kw

Bovine skin gelatin (BSG) based composite films were prepared by incorporating 2% zinc oxide nanorods (ZnO NRs) and clove essential oil (CEO) (25 and 50%, w/w of protein) via solution casting method. Structural, mechanical, oxygen barrier and antimicrobial properties of the composite films were evaluated. Furthermore, the applicability of the developed films in the packaging of shrimps was investigated. Tensile strength and oxygen permeability decreased whereas the elongation at break increased significantly when the concentration of CEO increased. Color, transparency, and anti-UV properties of BSG films were significantly influenced by the incorporation of both ZnO NRs and CEO. FTIR spectra revealed that the molecular organization of the BSG composite films changed significantly. Scanning electron microscopy revealed a porous surface of the composite films. Composite films containing ZnO NRs and 50% CEO showed maximum antibacterial activity against *Listeria monocytogenes* and *Salmonella Typhimurium* inoculated in shrimp during 20 days refrigerated storage.

BIODEGRADATION OF BENZENE BY ALKALIPHILIC BACTERIA UNDER AEROBIC CONDITIONS

Ahmed T. Ahmed Al-Sarhe¹ and Shaif M. Kasem Saleh²

Department of Chemistry, Faculty of Science, University of Aden, Yemen.

¹*E-mail: ahmedbiochem@gmail.com*

²*E-mail: Shamq2002@yahoo.com*

The aerobic biodegradation of benzene in laboratory cultures have been well studied, by using alkaliphilic bacteria strain *Bacillus badius D1*. The bacterial strain *Bacillus badius D1* could complete degradation of benzene at a concentration of 5 ml/100 ml at pH 9.0 within 48 hrs. The metabolites of aerobic degradation of benzene by this strain were identified as Catechol, 2-hydroxymuconic semialdehyde and 2- hydroxypenta-2,4-dienoic acid. The structural determination of the intermediates of benzene degradation was carried out by spectroscopic analysis like GC-MS chromatography and FTIR spectra. A tentative pathway of benzene degradation is also reported. To our knowledge, this is the first report that the isolated bacterial culture of *Bacillus badius D1* can capable to degraded benzene under alkaline conditions.

Keywords : *Bacillus Badius, Benzene, Biodegradation, Alkaliphilic, Metabolite*

**SYNTHESIS OF SOME NEW AZO-DYE FROM
HYDROXYQUINOLIN-2(1H)-ONE DERIVATIVES WITH
EXPECTED ANTIMICROBIAL ACTIVITY.**

Amira A. Ghoneim^{1,2} and Nesrin M. Morsy³

¹Chemistry Department, College of Science, Al-Jouf University, Sakaka, Kingdom of Saudi Arabia.
Tel.: 00966541609390.

² Chemistry Department, Faculty of Science, Zagazig University, Zagazig, Egypt; ³Department of
Organometallic and Organometalloid Chemistry, National Research Centre, Dokki, Egypt.

Address correspondence to this author at E-mail:aa_amiraatef@yahoo.com

The aim of the work synthesis of some novel azo-dye from 1,2-dihydro-4-hydroxy-2-oxoquinoline-6-sulfonic acid (**3**), 4-hydroxy-6-methoxyquinolin-2(1H)-one (**4**), 4-hydroxy-6-nitroquinolin-2(1H)-one (**5**). The prepared compounds were screened for antibacterial against *Staphylococcus aureus*, *Escherichia coli*, and antifungal activity against *Candida sp.*, *Aspergillus multi* and *Aspergillus niger*. The structure of newly compounds were characterized by ¹H-NMR, IR and elemental analysis.

Keywords: Antimicrobial activity; 4-hydroxy-6-nitroquinolin-2(1H)-one; azo dye and *Aspergillus niger*.

EXPERIMENTAL AND THEORETICAL INVESTIGATIONS OF THE MOLECULAR AND ELECTRONIC STRUCTURE OF PYRANE-BASED CEMRANOIDS OF MARINE ORIGIN

Zahra A. Alsaihati^{a*}, Ali I. Ismail^{1b}, Jamal Lasri^{1b}, Mohamed E. EL-Hefnawy^{b,c}, Walied M. Alarif^d, Khalid O. Al-Footy^a.

^a King Abdulaziz University, Faculty of Science, Jeddah, Saudi Arabia

^b King Abdulaziz University, Rabigh College of Science and Arts, Rabigh, Saudi Arabia.

^c Tanta University, Faculty of Science, Tanta, Egypt.

^d King Abdulaziz University, Faculty of Marine Sciences, Jeddah, Saudi Arabia

*Zahraa.alsaihati@gmail.com

One of a recently discovered marine origin cembranoids, that had been reported to exhibit a significant antibacterial activity, is studied here experimentally and theoretically to obtain its thorough structural, electronic and spectroscopic properties. The crystal and the exact molecular structure of sarcotrocheliol is determined for the first time using single crystal X-ray. Crystallography showed that the molecule is crystalline as orthorhombic, space group of $P2_12_12_1$, with the $a = 9.20(4)$ Å, $b = 10.80(4)$ Å, $c = 19.99(9)$ Å. ^1H , ^{13}C and DEPT-135 NMR measurements of sarcotrocheliol are reported in four different deuterated solvents; CDCl_3 , CD_3CN , MeOD_4 , and $\text{DMSO}-d_6$. Theoretical calculations are performed to find the main structural and electronic properties of the compound and are compared with the experimental values. Density functional theory (DFT) method at B3LYP/6-311++G(d,p) level of theory is used for all computed properties. Vibrational frequencies are obtained by DFT calculations and compared with the experimental values. Besides, time-dependent DFT implanted with PCM model is used to calculate the electronic absorption spectra in gas phase and in the specified solvents. Computed chemical shifts in the NMR are determined by GIAO method. The correlation coefficients between the calculated and experimental NMR chemical shifts are found to be better than 0.92 and 0.998 for of ^1H and ^{13}C NMR, respectively.

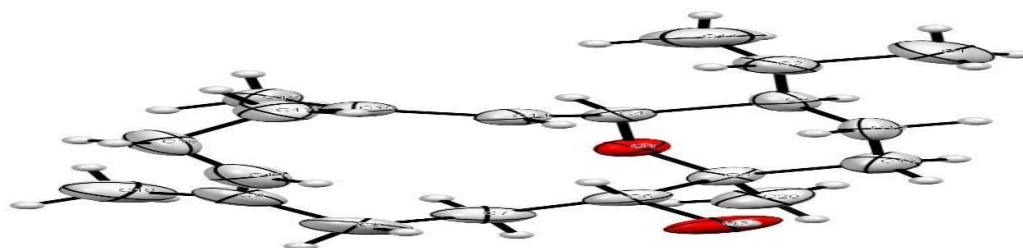


Figure 1. ORTEP presentation of sarcotrocheliol based on the crystal structural data; showing the atom-numbering scheme and 20% probability displacement ellipsoids of non-H atoms.

References

1. D. J. Faulkner, *Natural Product Reports*, Review, **2002**, 19 (1), 1-48.
2. M. P. Andersson, P. Uvdal, *The Journal of Physical Chemistry A*, **2005**, 109 (12), 2937-2941.

Acknowledgements: The authors would like to thank King Fahd Center for Medical Research for giving them the opportunity to work in its central laboratory.

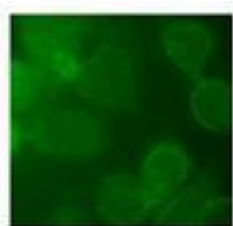
α -Amino acid Schiff base derived Ru/Pt complexes: Protein binding and Cytotoxicity against HepG2 cell

Ali Alsalmeh* and Rais Ahmad Khan,

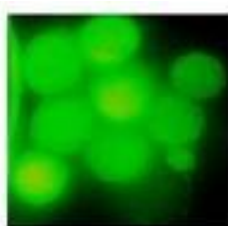
Department of Chemistry, College of Science, King Saud University, P.O. Box 2455, Riyadh 11451, Saudi Arabia

**aalsalme@ksu.edu.sa*

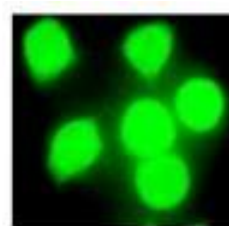
We have synthesized two new complexes of platinum (**1**) and ruthenium (**2**) with α -amino acid, L-alanine, and 2,3-dihydroxybenzaldehyde derived Schiff base (L). The ligand and both complexes were characterized by using elemental analysis and several other spectroscopic techniques viz; IR, ^1H , ^{13}C NMR, EPR, and ESI-MS. Furthermore, the protein-binding ability of synthesized complexes was monitored by UV-visible, fluorescence and circular dichroism techniques with a model protein, human serum albumin (HSA). Both the complexes **1** and **2** displayed significant binding towards HSA. Also, in vitro cytotoxicity assay for both complexes was carried out on human hepatocellular carcinoma cancer (HepG2) cell line. The results showed concentration-dependent inhibition of cell viability. Moreover, the generation of reactive oxygen species was also evaluated, and results exhibited substantial role in cytotoxicity.



Control



Treatment with PtL₂ complex



Treatment with RuL₂ complex

**MOLECULAR AND IMMUNOLOGICAL
CHARACTERIZATION OF *MYCOBACTERIUM TUBERCULOSIS*-
SPECIFIC *ESAT6*-LIKE GENES AND PROTEINS USING
POLYMERASE CHAIN REACTION AND CHEMICALLY
SYNTHESIZED PEPTIDES**

Abu Salim Mustafa

Department of Microbiology, Faculty of Medicine, Kuwait University, Kuwait

The analysis of *Mycobacterium tuberculosis* genome has revealed the presence of 23 ESAT6-like genes. The aim of this study was to determine the occurrence and specificity of all ESAT6-like genes in various mycobacterial species and evaluate the encoded proteins for immunological reactivity. Genomic DNA were isolated from *M. tuberculosis* H37Rv, four species of *M. tuberculosis* complex, nine species of mycobacteria other than *M. tuberculosis* complex, three species of non- mycobacterial organisms and 40 clinical isolates of *M. tuberculosis*. The isolated genomic DNA were tested in polymerase chain reaction with gene-specific primers for enzymatic amplification of the corresponding ESAT6-like genes. The results showed that all ESAT6-like genes were specific for *M. tuberculosis* complex. In addition, two of these genes (*esat6* and *cfp10*) were specific for the highly pathogenic *M. tuberculosis* and *M. africanum*. The diagnostic relevance of the encoded proteins was studied by determining the immunological (antibody) reactivity with sera from TB patients and healthy subjects by using chemically synthesized peptides in enzyme-linked immunosorbent assays. The results of estimation of antigen-specific IgG and its subclasses showed that almost all ESAT-6 like proteins were immunogenic and expressed in vivo. However, only two of these proteins and their peptides (peptide 4 of Rv3070c and peptides 4 and 5 of Rv3905) were major antigens and immunodominant epitopes, respectively. The same antigens and peptides were also immunodominant in healthy subjects as well. In conclusion, only the detection of DNA but not antibodies against ESAT6-like genes could be of diagnostic importance for *M. tuberculosis* complex, whereas the detection of *esat6* and *cfp10* could identify highly pathogenic members of *M. tuberculosis* complex.

INVITRO EVALUATION OF HSP27 INHIBITORS FUNCTION THROUGH HER2 PATHWAY FOR OVARIAN CANCER THERAPY

L. Alhadad

*Department of Chemistry, College of Science, Kuwait University, Kuwait
Laila.alhadad@ku.edu.kw*

Recently, American Cancer Society estimated that new ovarian cancer cases exceeded 22 thousand including 14 thousand expected death case. Clinically, the standard chemotherapy drugs used to treat patients with ovarian cancer are combination of a platinum-based drug such as carboplatin or cisplatin with a taxane such as paclitaxel or docetaxel. These drugs used to treat patients with this disease show undesirable drug resistance after the initial promising treatment. Therefore, the development of new drugs is urgently required to enhance the drug pharmacological activity and to reduce the drug's side effects. Nimesulide drug is used in our research lab as a starting material to synthesize a series of analogs, which have anticancer effect. These compounds target HSP27 because of its important cellular functions in the cell and it is up-regulated in cancer cells. HSP27 plays a role in tumor cell proliferation, differentiation, invasion, metastasis, and death. This study also provides the involvement of HER2, which is a trans-membrane protein tyrosine kinase receptor. HER2 is regulated by HSP27 through kinase phosphorylation and over-expression of HER2 is associated with a malignant phenotype in many cancers, including ovarian cancer. The goal for this study is to test nimesulide analogs toxicity effect on ovarian cancer cell proliferation and select the potent agents that reduce HER2 expression. The preclinical data demonstrate that our agents have strong anticancer activity and they reduce SKOV3 cell growth in-vitro through HER2 pathway. This series of potent agents that target HSP27 and reduce HER2 expression will be identified as future HER2 inhibitors for ovarian cancer therapy. In sum, synthetic nimesulide analogs, which target HER2 have confirmed successful ovarian cancer cell proliferation reduction.

References

1. Al Amri I W., Balachandran I., Thangirala S., Coleman A., Hassan A., Shaker A. *American Journal of cancer Biology*. **2013**. Vol. 1
2. Sweta R., Corcoran C., Liam S., Germano S., Breslin S., Madden S., Martina S., Brigid C. O'Donovan N., Crown J., Gogarty M., Annette T. and O'Driscoll L. *American Association for Cancer Research*. **2016**
3. Lukas, C.; and Hampton, G. *Ovarian Cancer – Clinical and Therapeutic Perspectives*. **2012**. 338
4. Kang S., Kang K., Kim K., Kwon B., Kim S., Lee H., Kong S., Lee E., Jang S. and Yoo B. *BMC Cancer*. **2008**. 8:286
5. Kyung Kim m., Kim s., Kim W., Kim K., Kim K., Yoo B. *EPMA Journal*. **2014**. 5(Suppl 1):A47
6. Zhong, B.; Lama, R.; Kulman, D.; Li, B.; Su, B. *European Journal of Medicinal Chemistry*. **2014**. 243e253

PSEUDO-SPIDER PHTHALOCYANINE (Pc) MOLECULES AS PHOTSENSITIZER BUILDING BLOCKS FOR MEDICINAL APPLICATIONS

Asaithampi Ganesan, Ali Husain, Saad Makhseed

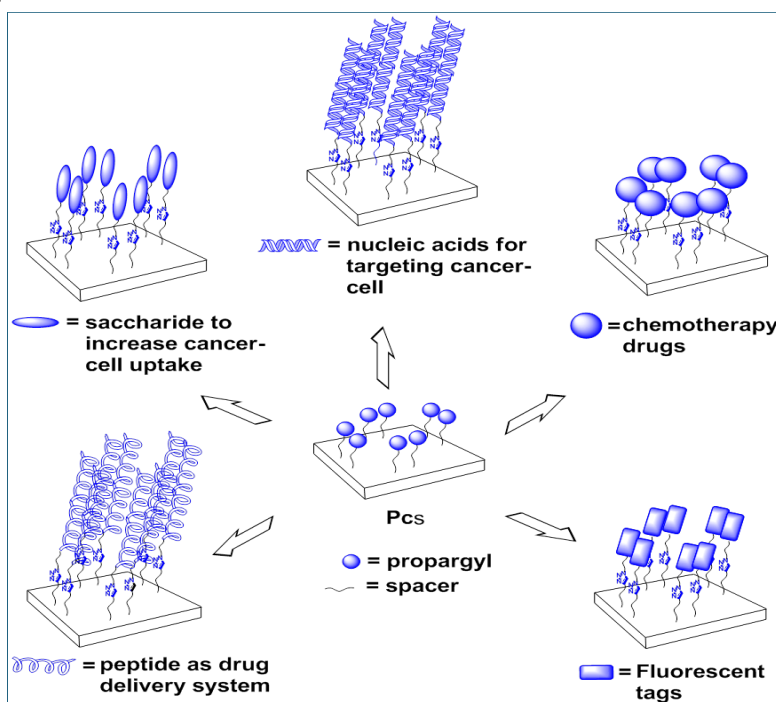
Kuwait University, Dr. Asaithampi Ganesan, Kuwait City, Kuwait.

Kuwait University, Dr. Ali Husain, Kuwait City, Kuwait.

Kuwait University, Prof. Saad Makhseed, Kuwait City, Kuwait.

e-mail: ahusain10@hotmail.com

Design and synthesis of novel phthalocyanine (Pc) and azaphthalocyanine (AzaPc) building blocks bearing multiple terminal acetylene moieties is described. The presence of multiple alkyne functionalities and their orientation (almost orthogonal) with respect to the Pc/AzaPc cores is with a great interest, since the resulted Pc/AzaPc systems would exist in their non-aggregated forms in aqueous and/or biocompatible media. Avoiding such drawback, i.e.; the self-association via π - π stacking, is significant in order to enhance the photophysical and photochemical properties along with their applications in photodynamic therapy (cancer treatment). Additionally, this remarkable achievement is noteworthy, since these macromolecules can be subjected as suitable molecular scaffolds for attaching, orienting and directing numerous set of drugs, MRI contrast agents, peptides, polymers, nucleic acids, amino acids, vitamins, photosensors and others, which would found valuable and appreciable uses, specially, in medicinal applications.



References

1. MaKhseed, S.; et al, *RSC adv.*, **2015**, *5*, 58854-58864.
2. Makhseed, S.; et al, *Chem. Comm.*, **2013**, *49*, 11149-11151.
3. Makhseed, S.; et al, *Angew. Chem.*, **2005**, *44*, 7546-7549.
4. Makhseed, S.; et al, *Chem. -Eur.*, **2005**, *11*, 2610-2620.

Acknowledgements: This work was funded by Advancement of Science-KFAS (grant no. P11514SC05) and Kuwait University Research administration; RSP unit general facilities of the Faculty of Science GFS (GS 01/01, GS 02/01, GS 03/01, GS 01/03, GS 01/05, GS 02/13).

HIGHEST SINGLET OXYGEN GENERATOR BASED ON PHTHALOCYANINES IN AQUEOUS MEDIA

Basma Ghazal,^a **Ali Husain**,^a **Mahmut Durmuş**^b, and **Saad Makhseed***^a

^a *Department of Chemistry, Kuwait University, P.O. Box 5969, Safat, 13060, Kuwait*

^b *Gebze Technical University, Department of Chemistry, P.O. Box. 141, 41400 Gebze-Kocaeli, Turkey*

Asymmetrical phthalocyanine (Pc) derivatives containing quaternized triazole moieties and iodine as a heavy metal atom were prepared to optimize their amphiphilic properties for clinical applications in photodynamic therapy (PDT). Spectroscopic characterization and photophysical analyses were performed to confirm their structural identities and therapeutic related properties respectively. Such materials can amazingly generate very high singlet oxygen in water ($\Phi\Delta$: 0.901) as a crucial factor in PDT and can efficiently permeate cancer cell membrane due to their ideal hydrophilic-hydrophobic properties.

Acknowledgements: This work was funded by the Kuwait Foundation for the Advancement of Science (Grant Number P114-14-SC01).

TARGETING INFLAMMATION WITH POLYLACTIC ACID NANOPARTICLES LOADED WITH siRNA/POLYETHYLENIMINE

K. Merzah

*Head of Pathological Analysis Dep., Usul Aldeen University College/ Baghdad Iraq
e-mail: dr_ksm@yahoo.com and kmerzah@gmail.com*

The availability of non-selective drugs, and therefore the use of very high doses, is a common problem today. An example of this impasse is inflammatory diseases. The advantages of nanoparticles used, include their ability to pass easily through physiological barriers, high concentration loading and rapid kinetics of resistance to degradation.

Polylactic acid nanoparticles loaded with siRNA/polyethylenimine was characterized (diameter of $\sim 573.1 \pm 19.3$ nm and a zeta potential of -12.84 ± 2.70 mV) in comparison to Empty NPs (diameter of 574.3 ± 12.3 nm and a zeta potential of -15.60 ± 2.30 mV). Polylactic acid siRNA can be electrostatically complexed by PEI and thus protected from RNase. In addition, Polylactic acid siRNA/PEI-loaded NPs are nontoxic through cytotoxicity assay.

The study suggests that Polylactic acid nanoparticles possess great potential for efficient and safer siRNA delivery in future clinical applications.

NPs protect siRNA against degradation *in vitro* and markedly increase their pharmacological activity under cell culture.

Table (1) shows the results of particles size and zeta potential measurements.

| | Particles size (nm) | Zeta Potential (mV) |
|-----------------------|---------------------|---------------------|
| Empty NPs | 574.3 \pm 12.3 | -15.60 \pm 2.30 |
| FITC-siRNA loaded NPs | 573.1 \pm 19.3 | -12.84 \pm 2.70 |

Table (2) shows the results of cytotoxicity tests.

| | Cytotoxicity (% of living cells) |
|-----------------------|----------------------------------|
| Empty NPs | 98.56 \pm 2.38 |
| NPs loaded with siRNA | 96.16 \pm 3.30 |

References

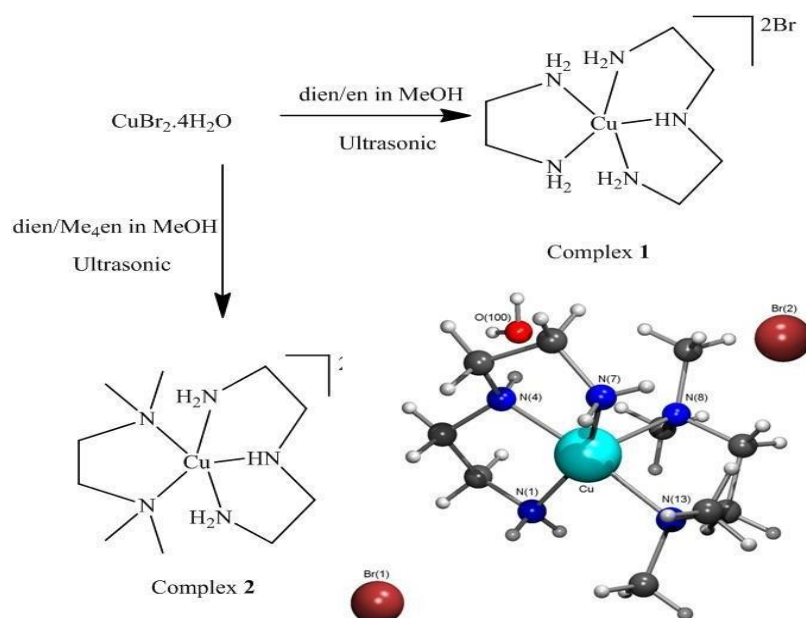
1. [Xiao B¹](#), [Laroui H²](#), [Viennois E³](#), [Ayyadurai S²](#), [Charania MA²](#), [Zhang Y²](#), [Zhang Z⁴](#), [Baker MT²](#), [Zhang B⁴](#), [Gewirtz AT⁵](#), [Merlin D³](#), *Gastroenterology*. 2014, 146(5), :1289-300.
2. Lieberman J, Song E, Lee SK, Shankar P., Trends Mol Med. 2003, 9,397–403.

SYNTHESIS AND XRD NOVEL OF [Cu(dien)(NN)]Br₂ COMPLEXES: THERMAL, SOLVATOCHROMISM, ELECTROCHEMISTRY, HIRSHFELD SURFACE ANALYSIS AND ANTIBACTERIAL ACTIVITY

Ismail Warad*, Anas Al-Ali and Fatima Abu Saleemh

*Department of Chemistry, Science College An-Najah National University P.O. Box 7, Nablus Palestine
warad@najah.edu*

Several dicationic water soluble copper (II) complexes of general formula [Cu(dien)NN]Br₂, [dien= diethylenetriamine and NN is en =ethylenediamine or Me₄en =N,N,N,N-tetramethylethylenediamine] were prepared under ultrasonic mode (Scheme1).



The desired complexes were characterized by elemental microanalysis, UV visible IR spectroscopy, thermal, electrochemical techniques and XRD. The single-crystal X-ray diffraction and Hirschfeld analysis showed a square pyramidal distorted geometry around Cu(II) center. The solvatochromism of the desired complexes was investigated in water and other suitable organic solvents. The results show that the Guttmann's DN parameter values of the solvents have mainly contributed to the shift of the d-d absorption band towards the linear increase in the wavelength of the absorption maxima of the complexes. The complex 1 showed higher antibacterial activity against the studied microorganisms compared to complex 2. Both complexes revealed promising antibacterial activities.

GENETIC ASSOCIATION BETWEEN HUMAN DNA DOUBLE-STRAND BREAK REPAIR GENE XRCC7 POLYMORPHISM WITH STAGING AND DEVELOPMENT OF BLADDER CANCER AMONG IRAQI PATIENTS

S.Mahmood^a, H. El-Yassin^b, U. Al-Nasiri^c

^a*Ph.D candidate in Clinical Biochemistry/college of medicine/University of Baghdad, MSc. Saleh Ali Mahmood, Baghdad, Iraq*

^b*Head of the Dpt. Of Biochemistry/ College of Medicine/ University of Baghdad, Prof. Dr. Hedef Dhafir El-Yassin MRCS (Ph.D., Post Doctorate), Baghdad, Iraq.*

^c*MB, ChB. DS (Urol).FRCS (Glasg), FRCS (Eng), Emeritus Prof of Urology, Iraqi Council of Medical Specializations.Baghdad, Usama-, City, Iraq.*
e-mail: salehalobeidi@gmail.com

Background: Bladder Cancer is the sixth most common malignancy in males worldwide, and the second in Iraq. DNA Double-Strand Break Repair Gene polymorphism may cause a reduction in DNA repair capacity and influence an individual's susceptibility to bladder cancer and the prognosis of the disease.

Objective: To investigate the influence of active tobacco smoking on human DNA repair gene XRCC7 (rs7003908) polymorphism in patients with bladder cancer in Iraqi patients and its relation to the staging and development of the disease.

Methods: A total 62 of histo-pathologically confirmed diagnosed bladder cancer patients and 38 age-matched apparently healthy controls were involved in the study. All were recruited from February to September 2017 in a case-control study conducted in the Department of Biochemistry at the College of Medicine University of Baghdad. Genotyping of the XRCC7 polymorphism (G>T) was evaluated using a polymerase chain reaction-restricted fragment length polymorphism (PCR-RFLP) and confirmed by Sanger sequencing method. The odds ratio (OR) and 95% confidence interval (CI) were calculated as a measure of the combined effect of cigarette smoking and DNA Double-Strand break Repair Gene XRCC7 Polymorphism on bladder cancer risk, staging, and development.

Result: The study found that patients with the homo polymorphic gene (TT genotype) have significantly increased the risk of bladder cancer (OR, 3.85; $p = 0.03$). While having the homo wild-type gene (GG genotype) could decrease the risk of bladder cancer. The GT genotype TT was also observed to be associated with a significantly increased risk of T1 (OR, 8.90; $p = 0.04$ and OR, 14.6; $p = 0.022$, respectively). TT genotype showed a highly significant increase risk in T2+ (OR, 7.9; $p = 0.01$) while is not significant in the Ta stage bladder cancer risk (OR, 0.13; $p = 0.19$). A statistically highly significant increased bladder cancer risk as a cumulative effect of smoking plus the polymorphic, wild type of the XRCC7 gene (OR, 15.00; $p = 0.0017$ and OR, 10.5; $p = 0.02$) respectively compared with non-smoker GG genotype.

Conclusion: The study suggests that having polymorphic gene TT genotype of DNA Repair Gene XRCC7 could increase the risk of bladder cancer and also affect the development and staging of the disease while having the GG genotype could decrease the risk of bladder cancer and increase the survival rate of bladder cancer patients.

Water Soluble monocationic $\text{Cu}(\text{NO}_2\text{-phen})_2\text{Br}]\text{Br}$ complexes: Crystal structure, physicochemical, Hirschfeld surface, solvatochromism, computational and DNA-binding analysis

Anas Al Ali, Malak Daqqa and Ismail Warad

Department of Chemistry, Science College, An-Najah National University, P.O. Box 7, Nablus, Palestine

anas.alali@najah.edu

Several monocationic water soluble copper(II) complexes of general formula $[\text{Cu}(\text{NO}_2\text{-phen})_2\text{Br}]\text{Br}$, ($\text{NO}_2\text{-phen} = 5\text{-nitro-1.10-phenanthroline}$) were prepared in good yield under ultrasonic mode. The desired complex was isolated as bromide salt and identified by MS, EA, UV-visible, TG/DTA, FT-IR, and XRD. The single-crystal X-ray diffraction and Hirschfeld analysis showed a square pyramidal distorted geometry around Cu(II) center. The geometry of the desired complexes were fully optimized with *ab-initio* methods and (DFT/B3LYP) density functional theory, then structural parameters were compared to XRD data. The solvatochromism of $[\text{Cu}(\text{NO}_2\text{-phen})_2\text{Br}]\text{Br}$ complex was investigated in several polar solvents. Absorption and viscosity titration studies conclude that $[\text{Cu}(\text{NO}_2\text{-phen})_2\text{Br}]\text{Br}$ complex is a very good CT-DNA binder.

Key-Words: Cu(II) complexes, XRD, solvatochromism, DFT, DNA-binding.

FACIAL ACNE THERAPY BY USING PUMPKIN SEED OIL WITH ITS PHYSICOCHEMICAL PROPERTIES

Abeer A. Ibrahim^a, Tara F. M. Salih^b, Taghreed H. Al-Noor^c

^{a,b}*Sulaimani Polytechnic University, Technical College of Health, Medical Laboratories Science Department, Kurdistan region, Iraq.*

^c*University of Baghdad, Ibn -Al-Haithem College of Education, Department of Chemistry Baghdad, Iraq.*

e-mail: drtaghreed2@gmail.com

The herbal remedy individually or in combination with standard medicines has been used in diverse medical treatises for the cure of different diseases. Pumpkin seed oil is one of the recognized edible oil and has substantial medicinal properties due to the presence of unique natural edible substances. Inflammation is an adaptive response that is triggered by noxious stimuli and conditions, which involves interactions amongst many cell types and mediators, and underlies many pathological processes. Unsaturated fatty acids (UFAs) can influence inflammation through a variety of mechanisms, and have been indicated as alternative anti-inflammatory agents to treat several inflammatory skin disorders. Pumpkin seed oil is rich in (UFAs), that its topical anti-inflammatory properties have been investigated. For that reason, the goal of this article was to evaluate the effects of pumpkin seed oil on acute and chronic cutaneous inflammation experimental models.

The extracted pumpkin seed oil had an acceptable initial quality, when it was extracted using soxhlet extraction method and was characterized using standard methods. The physicochemical parameters of purified oil were determined. The boiling point of pumpkin seed oil was (158.90 °C) that equal to the values obtained in literature for some oil seeds, but lower than the boiling point of the oils studied, plus the melting point of pumpkin seed oil was (15.39 °C) that lead to a characteristic in cold cream manufacture. The iodine value was (104 ± 0.03 mg of KOH/g) of oil, indicated a high degree of unsaturation. The saponification value was (181 ± 3.2 mg KOH/g), this value indicated the pumpkin seed oil had fatty acids with higher number of carbon atoms. As a final point, the acid value was low (0.67 ± 0.09 mg KOH), while the peroxide value was low (10.03 ± 0.59 meq peroxide /kg).

Keywords: Therapy of acute and chronic facial inflammation, the physicochemical parameters of extracted oil.



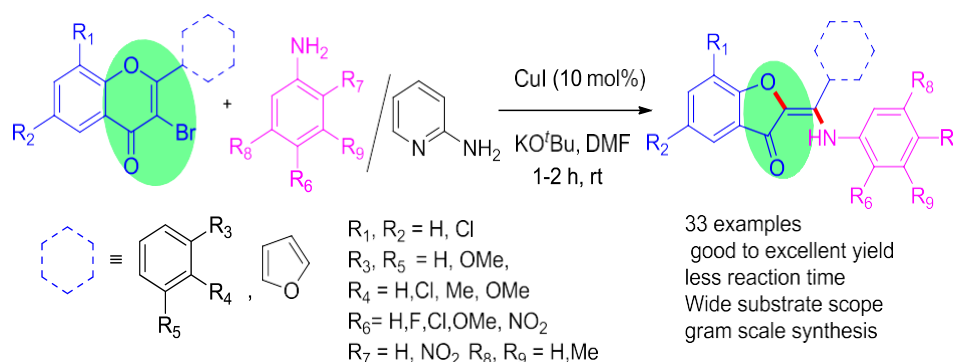
CU(I)-CATALYSED ISOMERIZATION OF FLAVONES TO THE REGIOSELECTIVE *TRANS*-AMINATED AURONES WITH ANILINES VIA DOMINO-AZA MICHAEL ADDITION, RING OPENING AND CYCLIZATION REACTIONS UNDER BASIC CONDITION

Iram Parveen and Naseem Ahmed*

Department of Chemistry, Indian Institute of Technology Roorkee, Roorkee-247 667, India

*Corresponding author. Fax and Tel.: +911332 285745; E-mail: nasemfcy@iitr.ac.in

Aurones (2-benzylidenebenzofuran-3(2H)-ones) are one of the most interesting class of flavonoids which are prevalent in the core structure of several naturally occurring and biologically active alkaloids, drugs candidates and natural products and provide a bright yellow color to the plant in which they occur.¹ A Cu(I)-catalysed cascade aza-Michael addition, ring opening and cyclization reactions between 3-bromoflavones and anilines afforded highly functionalized *trans*-aminated aurone derivatives in the presence of potassium tertiary butoxide at room temperature.²⁻⁴ The protocol is operationally successful with ease, avoids the requirement of additives, ligand and offers broad substrate scope with good to excellent yields (61-83%).



References:

1. Gholami, A., Geyter, N. D., Pollier, J., Goormachtig, S., and Goossens, A. *Nat. Prod. Rep.* **2014**, *31*, 356–380.
2. Mohammed Waheed and Naseem Ahmed, *Tetrahedron Letters* **2016**, *57*(33), 3785–3789.
3. Nishant Verma, Sumit Kumar, Naseem Ahmed, *Tetrahedron Letters* **2016**, *57*(31), 3547–3550.
4. Sumit Kumar and Naseem Ahmed, *RSC Advances* **2015**, *5*(94), 77075–77087.

Synthesis, characterization and antimicrobial activities of [Co(II), Ni(II), Cu(II), Zn(II) and Cr(III)] mixed ligand complexes Schiff base derived from Trimethoprim antibiotic and acetylacetone with oxalic acid

Taghreed Hashim Al-Noor^a and Ghassan Thabit Shinain^b

*Department of Chemistry, Ibn- Al Haitham Education for Pure Science College,
University of Baghdad, Baghdad, Iraq
Email.drtaghreed2@gmail.com*

A new Schiff base synthesis is requires refluxing the mixture of acetyl cetone and Trimethoprim in ethanolic solution. The metal complexes were prepared by mixing saturated solutions of Schiff Base as a primary ligand and Oxalic acid as secondary ligand and metal salts in appropriate molar ratio in ethanol solvent are reported.

The ligand has been characterized by elemental analysis, Fourier Transform Infrared (FTIR), Nuclear Magnetic Resonance (¹H NMR, ¹³C-NMR) and (UV-Vis) spectroscopy.

The structures of these complexes are confirmed by using FT-IR and UV- Vis spectroscopies, and magnetic susceptibility measurements (meff), (molar conductivity, melting points measurements), (Cl % and metal % analysis) revealed that the complexes analyze indicates a six coordinated as : [M (Ox) (L)]
M = [Co(II), Ni(II), Cu(II) and Zn(II)] and [Cr (Ox) (L)]Cl Oxalate an anion = (Ox²⁻)

The synthesized ligand and its metal complexes were screened for their antimicrobial activities against {(*Staphylococcus aureus* (G+), *Bacillus subtilis* (G+), *Enterobacter Cloaca e* (G-) bacterial strains .

Keywords: Trimethoprim, Oxalic acid complexes, Acetyl acetone, Schiff Base

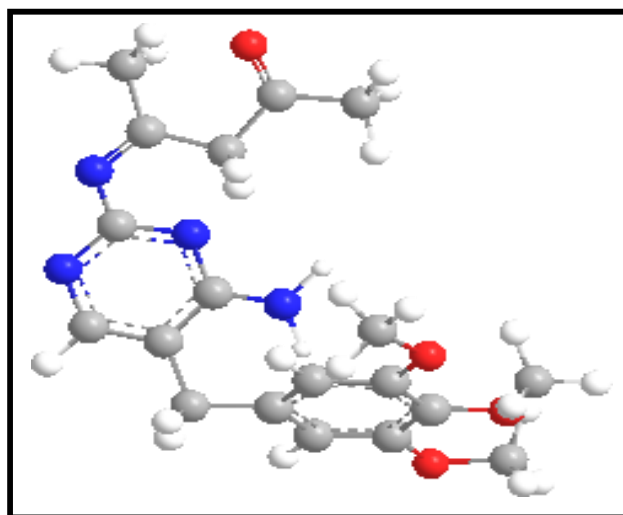


Figure1. :Structure of (Z)-4-((4-amino-5-(3,4,5-trimethoxybenzyl) Pyrimidin -2-yl)imino)pentan-2-one (L) as 3D model

References

- [1] Jadhav SS, Kolhe NH and Athare AE., Int J pham Bio Sci (2013) July; 4(3); 45-54.
- [2] Yam V. W. W. and Lo. K. K. W.. J. Coord. Chem. Rev., 184, (1999). 158-240.

INTERVENTIONAL BIOLOGICAL MARKERS FOR SARCOPENIA AND MUSCLE FRAILITY IN IRAQI SUBJECTS

Hadaf Al-Yaseen, Walaa Ismail Jasim, Nazar Abdulatif

Head of Dept. Biochemistry/ College of Medicine/ University of Baghdad

Email address: hedefelyassin@gmail.com

hedefelyassin@uobaghdad.edu.iq

Older age is usually accompanied by functional decline due to loss of skeletal muscle mass and quality. Sarcopenia and muscle frailty are both highly relevant entities with regards to functionality and autonomy of older adults.

European Working Group on Sarcopenia in Older People (EWGSOP) founded in 2009 has put the main criteria for clinical diagnosis of sarcopenia including the following domains: Physical performance, Muscle strength and /or Muscle mass.

Sarcopenia is also associated with modifications in biological functions, including inflammation, glucose, regulation, hormone production, cellular, communication and protein storage. However no laboratory guidelines' have yet been established for confirmatory testes of the diagnosis.

Aim: the aim of the present work is to identify specific biological markers that can quantify in a reliable and cost-effective manner, and serve in the qualitative assessment of the physical function impairment, to support the clinical diagnosis and the follow-up of sarcopenia.

Subjects:

The study included (100) sarcopenic subjects (50 male and 50 female) and (50) non sarcopenic subjects (25 male and 25 female). Information were taken from each subjects(age, gender, patients with inflammatory disease (rheumatoid arthritis systemic lupus erythematosus (SLE)), Diabetes Mellitus, Thyroid disease and patients taking steroid therapy were excluded.

Subjects with primary sarcopenia were diagnosed by: Short Physical Performance Battery (SPPB) and dual-energy x-ray absorptiometry (DEXA) to determine (Appendicular skeletal muscle mass (ASM), Total lean body mass(TLBM) and Body Mass Index(BMI)) .

Results

Mean values of (ASM, LBM and α 1ACA) in control group were more than study group and men more than women. Also there mean values were decrease with aging. While (P3NP,IL-6,hs-CRP, CAF and BMI) mean values in study group ,were more than control group and in women more than men except BMI in male more than female. Its values increase with increasing age.

Conclusions

Mean values of (ASM, LBM and α 1ACA) in control group were more than study group and in women less than men because sarcopenia defined as a reduction in ASM/height², and total lean body. Alpha1-antichymotrypsin has a direct relation withASM, LBM. While (P3NP,IL-6,hs-CRP, CAF andBMI) have indirect relation with ASM, LBM and α 1ACA. So clinical variables values were increased:

1. with age ,
2. in study group more than control group
3. in women more than men.

MEGAMOX MEDIATES SELENIUM NANOPARTICLES SYNTHESIS FOR DEVELOPING IMMUNOMODULATORY, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES AGAINST MULTI-DRUG RESISTANT BACTERIA AND MYCOBACTERIUM TUBERCULOSIS

Ahmed, A. Askar*¹ and Asmaa, M. Abouzaid²

¹ Botany and Microbiology Department, Faculty of Science (Boys), Al-Azhar University, Cairo, Egypt.

² Botany and Microbiology Department, Faculty of Science (Girls), Al-Azhar University, Cairo, Egypt.

Here for the first time, we tailored a methodology, including Selenium nanoparticles (SeNPs) eco-friendly construction, in aqueous solution using Megamox (Mega.), a broad-spectrum antibiotic. SeNPs were characterized by UV-Vis., FT.IR, XRD, DLS and TEM image. Immunomodulatory, Antioxidant and Antimicrobial activities of SeNPs and Mega., were studied against multidrug resistant, standard bacteria, and fungi. From results, TEM with DLS images explained the size and shape of SeNPs and were found to be monodispersed spherical SeNPs with mean diameter of 22.4 nm. FT.IR analysis indicates that, the hydroxyl and nitrogen moiety in Mega. Were responsible for the reduction and binding process. According to the results of the NBT reduction test SeNPs and Mega. showed high intracellular killing activity which confirmed the immunostimulatory. Antioxidant activity of SeNPs and Mega., were observed at percentage 90% and 82% respectively. SeNPs was showed strong activity against Gram-positive, Gram-negative bacteria and antifungal activity against both unicellular and filamentous fungi. It also, exhibits strong potential towards multi-drug resistant bacteria include Staphylococcus aureus (MRSA), Staphylococcus epidermis, Escherichia coli, Pseudomonas aeruginosa, Acinetobacter baumannii, Klebsiella pneumonia and Mycobacterium tuberculosis. The results of inhibition zone are listed as: 28 mm, 31 mm, 25 mm, 22 mm, 27 mm, 32 mm and 36 mm, respectively. Thereby, owing to its promising characters as cost-effective with continued-term stabilization and effective features, it can discover potential targets in medical and infectious diseases control.

Key words: Nanoparticles, Megamox, Synergism, TEM, Spectroscopy, Immunostimulatory, MRSA and C. albicans.

A COMPARISON OF DIFFERENT PREPARATION CONDITIONS ON POLYPHENOLS IN TEA INFUSIONS

M. Alhafez^a, F. Kheder^b, M. Aljoubbeh^c

*a*Department of chemistry, Faculty of Sciences, Damascus University, Damascus, Syrian Arab Republic

*b*Department of chemistry, Faculty of Sciences, Damascus University, Damascus, Syrian Arab Republic

*c*Department of chemistry, Faculty of Sciences, Damascus University, Damascus, Syrian Arab Republic and Syrian Private University, Damascus, Syrian Arab Republic e-mail: m.alhafez12@gmail.com

Tea is one of the most popular drinks around the world [1]. The production of tea differs slightly according to the kind of tea desired: white, green, oolong and black, so the freshly plucked leaves may undergo one or more of the following processes: withering, rolling, fermentation, drying and grading [2]. Due to the great importance of polyphenols presence in tea, much of the tea literature is dedicated to determine their levels in tea leaves and infusions [3], [4], [5], [6].

A multitude of brewing methods were developed around the world [7] which in turns influence the polyphenols both quantitatively and qualitatively [4]. We applied different conditions for preparing tea infusions to determine and compare the total phenols (TP), total flavonoids (TF) and one of the major catechins present in tea; (-)-epigallocatechin gallate (EGCG). The methods used to prepare the infusions were: a) Non-constant temperature; where each tea sample was brewed at three different water temperatures for four different brewing durations. b) Continuous infusion method; in which each tea sample was brewed at a constant temperature for four different brewing durations. Figure 1 shows the main difference between the two methods used.

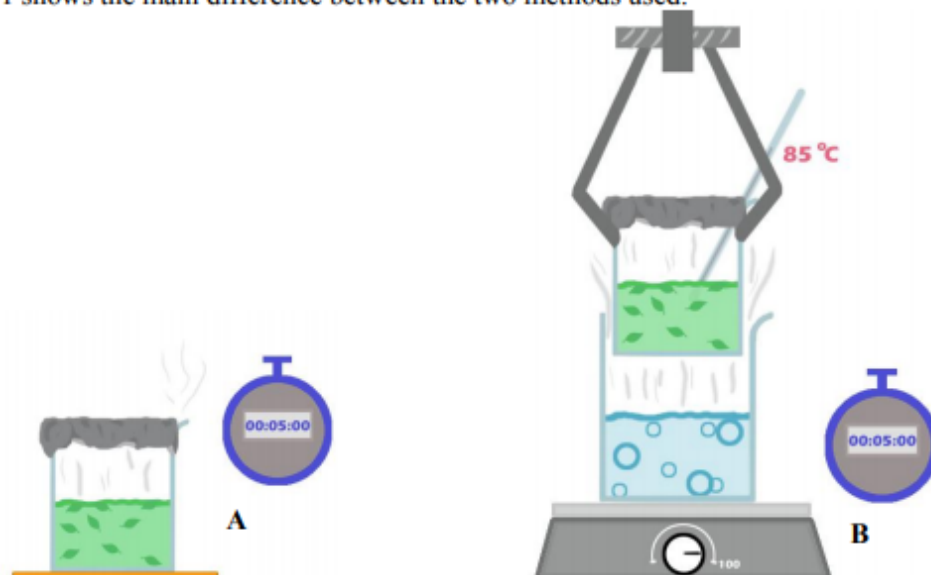


Figure 1. The methods used to prepare tea infusions (A) Non-constant temperature and (B) Continuous infusion.

BIOCOMPATIBILITY OF POLYURETHANES FOR MEDICAL APPLICATIONS

¹Mariam N. Al-Saedi, ²Balsam Q. Saeed and ³Mahmoud A. Mohsin

¹Department of Chemistry, United Arab Emirates University, P.O. Box 17551 Al-Ain, UAE

²Department of Clinical Science, University of Sharjah, P.O. Box 27272, Sharjah, UAE

³Department of Chemistry, University of Sharjah, P.O. Box 27272, Sharjah, UAE

E mail: mmohsin@sharjah.ac.ae

Linear thermoplastic polyurethane elastomers, with a range of formulations based on soft-to-hard segment ratio were synthesized in bulk using Diphenylmethane-4,4'-diisocyanate (MDI), Butandiol (BD) as chain extender, and Polycaprolactone diol (PCL) having varying molecular weights. The polymers, having chemical and structural variables that affect the overall properties were produced, analyzed and characterized using Thermogravimetric Analysis (TGA), Fourier Transform Infrared spectroscopy (FTIR), Nuclear Magnetic Resonance spectroscopy (NMR) and Differential Scanning Calorimetry (DSC). Hardness and rheological properties were also examined. Biocompatibility tests were carried out on selected polyurethane samples in order to establish its suitability for a desired medical application, such as implant or hip prosthesis. The results were analyzed using both Scanning Electron Microscopy (SEM) for the polyurethane samples and Optical Microscopy (OM) for the biological tissues.

The main finding was that some polyurethane samples with uniform distribution between hard and soft segments had the lowest adverse biological effect. Other samples caused severe irritation to the tissue and had noticeable surface erosion of the polymer sample. This can be traced to the polyurethane composition and the curing process used during the synthesis process.

The initial experimental results provided evidence that the properties of polyurethanes can be tailor made to be biocompatible for biomedical applications, depending on their chemical structure, extend of hard and soft segments segregation, and their chemical composition.

Keywords: Thermoplastics; polyurethanes; chemical structure; characterization; bulk polymerization; polycaprolactone diol.

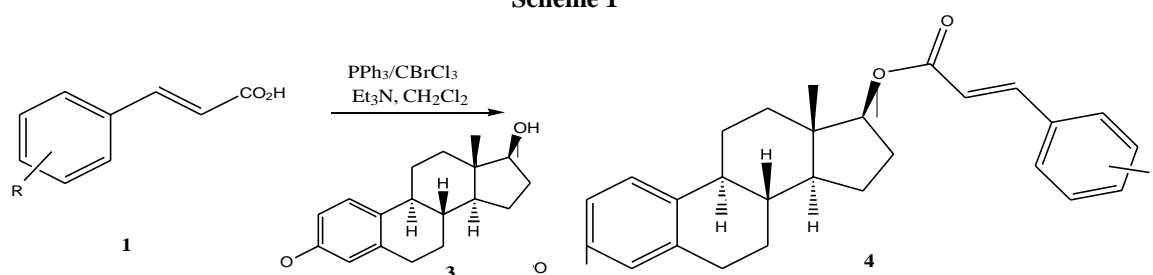
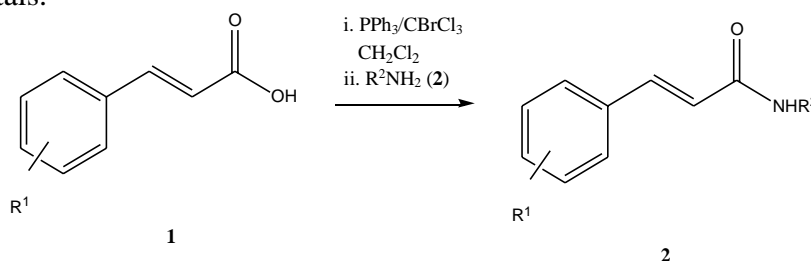
**REPLACEMENT OF THE OZONE DEPLETOR
TETRACHLOROMETHANE WITH BROMOTRICHLOROMETHANE IN
APPEL TYPE REACTIONS – FACILE AMIDATION, ESTERIFICATION,
ANHYDRIDE FORMATION AND PREPARATION OF NITRILES**

**N. Al Soom,^a A. Al-Hemyari,^a J. Pajak,^a Y. Al-Jasem,^b M. Bufaroosha,^a
T. Thiemann,^{a*}**

*Department of Chemistry, ^aFaculty of Science, and ^bDepartment of Chemical Engineering, Faculty of
Engineering, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates. E-mail:*

nuhalsoom13@hotmail.com; thies@uaeu.ac.ae

In the past, chlorinated small molecules such as trichloroethane and tetrachlorocarbon have been used as solvents for industrial processes in large amounts. These can escape into the environment and have been vented into the earth's atmosphere, where they react with UV light, creating chloro radicals which then destroy the ozone layer (1-2). Within this context, a larger number of chemical transformations have been reported using CCl₄/PPh₃ (3-5). In this contribution, the possibility of replacing CCl₄ with BrCCl₃, as a chemical of less environmental concern, has been studied. It was found that with BrCCl₃/PPh₃ amides (**Scheme 1**), esters (**Scheme 2**) and anhydrides could be formed from the requisite acids. Also, the dehydration of benzamides to benzonitriles and the preparation of *N*-(phenylsulfonyl)-triphenylphosphoranylideneamide using BrCCl₃/PPh₃ have been carried out successfully. Finally, the reaction has been used as a key step in the synthesis of steroidal quinone hybrids and 4'-alkoxy-4-(ω -cinnamoylalkoxy)azobenzenes as potentially switchable dopants in azobenzene derived liquid crystals.



Keywords: tetrachloromethane, bromotrichloromethane, Appel-type reaction, amidation, esterification, steroidal quinone hybrids, switchable liquid crystals

1. An atmospheric life time of 85 years has been ascribed to CCl₄ in: K. Dow, T. E. Downing, *The Atlas of Climate Change*, **2006**.
2. UNEP (1996) In: *Handbook for the international treaties for the protection of the ozone layer*, 4th ed., pp.18-39.
3. R. Appel, *Angew. Chem. Int. Ed. Engl.*, **1975**, *14*, 801.
4. E. Yamato and S. Sugawara, *Tetrahedron Lett.* **1970**, 4383.
5. R. Appel and H. Einig, *Z. Naturforsch.* **1975**, *30B*, 134.

CORRELATION BETWEEN FETUIN A LEVEL AND GLYCOSYLATED HAEMOGLOBIN IN PATIENTS WITH MYOCARDIAL INFARCTION.

Dina Ayed Mohammed^a, Haydar H. Al-Shalah^b

^a*Department of Biochemistry, College of Medicine, University of Baghdad.*

^b*Department of Biochemistry, College of Medicine, University of Babylon.*

MI is a major cause of morbidity and mortality worldwide. There are many risk factors for MI, diabetes mellitus reported to increase the risk. FA is an endogenous inhibitor of tyrosine kinase, and may be related to the presence of insulin resistance in the target tissues, in healthy adults. The aim of present study was to shed a light on the possible correlation between FA and HbA_{1c} in diabetic patients with AMI.

This is a case-control study performed between the first of December 2015 and first of March 2016 included 88 subjects divided into two groups; 44 diabetic patients with AMI and the other 44 were apparently healthy individuals taken as a control. Patients were diagnosed by consultant physician at Marjan Medical City /Hilla. Fetuin-A level in serum was measured by sandwich enzyme-linked immunosorbent assay (ELISA) using a kit provided by Biorbyt / USA. HbA_{1c} was determined by high performance liquid chromatography (HPLC) using D-10 instrument /USA.

There was a significant difference in the mean of FA serum level between patients of AMI (16.79 ± 3.68) and control (18.84) ($p < 0.05$). Similarly, there were significant mean differences of HbA_{1c} between patients of AMI (7.26 ± 3.08) and control group (5.06 ± 0.61), ($p < 0.05$). However, There was no correlation between two parameters (P value > 0.05)

This study concluded that there was no correlation between FA and HbA_{1c} in patients with MI.

Key Words: Acute myocardial infarction- Fetuin A- HbA_{1c}

Synthesis of anti-alpha glucosidase and anti-acetylcholinesterase active copper complexes of novel Schiff bases derived from N-[4-(hydrazinecarbonyl)phenyl]-2-[(5-phenyl-1,3,4-oxadiazol-2-yl)sulfanyl]acetamide.

Tariq Mahmud^{1*}, Aqsa Gulzar¹, Asma Anjum², Warda Shahid³, Sojhla Hamid³

¹Institute of Chemistry, University of the Punjab, Lahore-54590, Pakistan

²Division of Science and Technology, University of Education, Lahore, Pakistan.

³Department of Chemistry, The Islamia University of Bahawalpur, Bahawalpur, Pakistan.

Email: tariqm06@yahoo.co.uk

Abstract

Two novel Schiff bases were synthesized by the versatile synthetic scheme starting with benzoic acid which was converted into ester and then to benzo hydrazide. The ester group of the above mentioned compound was then converted into hydrazide by refluxing them with hydrazine hydrate in ethanolic solution. In this way the novel hydrazide was obtained which was further condensed with benzaldehyde and salicylaldehyde to prepare two novel Schiff bases. The synthesized Schiff bases were further utilized for complex formation with Cu (II) ion. All the synthesized compounds were characterized by using various techniques including ¹H NMR, ¹³C NMR, FTIR, MS, AAS and UV-VIS spectroscopic techniques. Schiff bases synthesized from acylhydrazide having an extensive variety of biological activities

i.e. *Adriamycin* immune conjugates, anti-parasitic proteinase inhibiting activity against *Trypanosomabrucei*, which is the major cause of sleeping sickness in people, antimycobacterial, insecticidal and anti-leishmanial [8-10]. Anti-acetyl cholinesterase activities of the novel Schiff bases and their complexes were also tested in order to know their anti-enzymatic nature. The results, obtained for the evaluated compounds showed that Schiff bases were totally inactive while their complexes were found to be active against these enzymes. Geometries of the complexes were proposed on the basis of AAS / ICP, FTIR, magnetic moment values, conductance measurements and electronic absorption spectral data.

References

1. Greenfield, R.S., Kaneko, T., Daves, A., Edson, M.A., Fitzgerald, K.A., Olech, L.J. *Cancer Res.* **1990**, 50, 6600–6607.
2. Cafferey, C.R., Schanz, M., Nkemgu-Njinkeng, J., Brush, M.E., Hansell, F.E., *Antimicrob. J. Agents.* **2002**, 19, 227–231.

Acknowledgements: The authors are grateful to Higher Education Commission (HEC), Government of Pakistan, for access to Scientific Instrumentation and Institute of Chemistry, University of the Punjab, Lahore-Pakistan, for providing laboratory facilities.

MOLECULAR BASIS OF VITAMIN D₃ RECEPTOR GENE POLYMORPHISM (RS 2228570) AS PREDICTOR FOR CORONARY ARTERY DISEASES

Siham Abdul Zahra¹, Fadhil Jawad Al-Tu'ma¹

¹*Department of Biochemistry –college of Medicine –University of Kerbala /Iraq
Correspondence to Siham Abdul Zahra (email: wardalyasmeen89.89@gmail.com)*

Objective: Coronary artery disease (CAD) remains the first killer and a common silent disease in the world. In latest years, coronary artery disease is increasing and accounts for a high proportion among others diseases In Iraq .Various studies have shown that the polymorphisms within vitamin D receptor VDR-FOKI gene like rs 2228570 are associated with coronary artery disease patients and this polymorphism can cause variations in BMI , lipid profile

Aims of study: To study the association of vitamin D receptor VDR-FOKI gene polymorphism (rs2228570) with CAD in Iraqi population and to explore the impact of this polymorphism on BMI , lipid profile on patients .

Methods and Materials: The current study consist of 150 CAD patients who Underwent To the angiography department and then classified in to four classes according to Rentrop Score system which used to classify the severity of CAD . The four classes based on luminal stenosis and the number of coronary artery involved .Class zero with the stenosis of artery less than 50% and class I , class II, class III which associated stenosis more than 50% .Another 150 healthy control individuals who are free from any disease were used . The Phenotypic data included are body mass index (BMI), and levels of blood sugar (RBS), lipid profile, and Blood urea ,Serum creatinine . Genotyping of rs2228570 polymorphism are carried out by PCR–RFLP. DNA was extracted from whole blood and genotyping was achieved with specific primers to amplify fragments for digestion with restriction enzymes. The enzyme FOKI was used for the digestion of VDR gene product followed by electrophoresis on agarose gel. Various statistical analyses were applied to analyze the observed data.

Result PCR product of VDR-FOKI gene exhibited an amplicon size of 273 bp, when this amplicon digested with FOKI enzyme, it gives three genotypes indicated one (273bp) , two (75 bp + 198 bp) and three (75 bp + 198 bp + 273 bp) bands for those with wild type (TT) , homozygous (CC) and heterozygous (TC) genotypes respectively. Genotype frequencies of rs2228570 polymorphism were found to be consistent with Hardy–Weinberg equilibrium. Allele frequencies of TT wild genotype(33.3%), TC heterozygous genotype (46.7%), and CC homozygous genotype (20%)in cases of CAD group while 66.7%, 30 % and 3.3 % for wild, heterozygous, and homozygous in the control group respectively. The homozygous genotype (CC) was significantly (OR= 7.25, CI 2.74-19.20 , P<0.001(increased the risk of CAD seven and quarter folds with respect to those of the wild type(TT) after adjustment for age, sex and BMI, while the TC genotype significantly (OR = 2.04, CI 95% ;1.27- 3.28,P<0.001) raised the risk of CAD by two folds. Co dominant genotypes of rs 2228570 polymorphism exhibited significant association with raised BMI and , and lipid profile among subjects groups.

Conclusion: We conclude that the gene polymorphism of VDR-FOKI associated with high risk for development and progression of CAD In Iraqi population .

SYNTHESIS, CHARACTERIZATION, MOLECULAR DOCKING AND ANTI-TUMOR ACTIVITIES OF SOME TRANSITION METAL (II) COMPLEXES WITH SEMICARBAZONE

M.A. Hussien^{a,b}, **Najlaa S. Al-Radadi**^{c*} and **H. M. Salama**^b

a Chemistry Department, Faculty of Science, King Abdullaziz University, jeddah, Saudi Arabia

b Chemistry Department, Faculty of Science, Port Said University, Port Said, Egypt

c Chemistry Department, Faculty of Science, Taibah University, Madinah Monawara, Saudi Arabia

E-mail address: nsor26@hotmail.com, nsor2644@yahoo.com, nsa@taibau.edu.sa

tel: +966-505302644

Complexes of Mn(II), Co(II), Ni(II), Cu(II) and Zn(II) with the ligand ((E)-((2-hydroxynaphthalen-1-yl)methylidene)amino)urea have been synthesized. The complexes were characterized by elemental analysis, molar conductivity, spectral methods (IR and ¹H NMR) and simultaneous thermal analysis (TG/DTG) techniques. IR, Spectra, ESR The molar conductance measurements for all complexes are non-electrolytic nature. The kinetic thermodynamic parameters are ΔE , ΔH , ΔS and ΔG are estimated from the DTG curves. These complexes provide better activities against human prostatic cell line PC-3 than the free ligand. Molecular docking was used to predict the binding between the ligand with the receptor of prostate cancer (H874Y) hormone.

Keywords: Semicarbazone; Theoretical calculations; Molecular docking; ESR; Thermal analysis.

LC-MS IN TRADITIONAL HERBAL MEDICINE: THE ANTIOXIDANT POTENTIAL IN *SALVIA OFFICINALIS* L. IS RELATED TO ROSMARINIC ACID AND LOWER MALONDIALDEHYDE-THIOBARBITURIC ACID

N. M. Al-Mansour^{a*}, A. Hajeyah^b

^a University of Kuwait, Department of Biological Sciences, Plant Biology Program, State of Kuwait

^b University of Kuwait, Department of Biological Sciences, Biochemistry Program, State of Kuwait * e-mail: naemar5almansour@gmail.com

The application of LC-MS in medicinal-based studies is a focal research interest in pharmaceutical industries. Natural products derived from herbal species such as *Salvia officinalis* L. possess a wide array of antioxidant properties. Extracts of *S. officinalis* are preferable alternative remedies for some chronic, neurodegenerative, immune- & age-related disorders. However, characterization of the active ingredient compounds in herbs require accurate development of methodologies for both separation and detection of secondary metabolites with nutritional and therapeutic significances. In this preliminary study, we exploit the use of LC-MS, as a versatile high-resolution instrument, in characterizing the potential use of sage-derived polyphenols as antioxidant compounds in herbal medicine. Leaf material was extracted for 16 h in Soxhlet extraction apparatus using methanol as a refluxing solvent. The concentrated residue-free sage methanolic extracts were used for subsequent polyphenols analyses using LC-MS (Xevo G2-S QToF). The phenolic quantification chromatograms of 3 runs were compared and identified by their molecular ion (m/z) values & retention times via comparison with related literature and the use of a database. Data indicated high quantities of rosmarinic acid with a molecular ion (MI) of 359.30 (m/z) and retention time (RT) of 5.66 min as verified from a standard calibration curve of such purified reference. Rosmarinic acid is an ester of caffeic acid and 3,4-dihydroxyphenyllactic acid which serves as polyphenolic quenchers under oxidative stress conditions. Consuming reasonable amounts of sage tea, therefore, can boost cells with natural antioxidant scavengers against free radicles. Interestingly, extract quantification with LC-MS also indicated the existence of other compounds differ widely in RT and MI values. These included Caffeic Acid Glucoside (CAG) with MI of 341.35 m/z and RT of 0.7 min, Chlorogenic Acid (CA) with MI of 353.31 m/z and RT of 2.83 min and Ferulic Acid (FA) with MI of 193.30 m/z and RT of 5.21 min. Data also indicated that the vibrant green-gray colored fresh leaves of *S. officinalis* contain significant contents of flavonoids. The lower values of malondialdehyde-thiobarbituric acid (MDAT) suggests a strong protective power and antioxidant capacity of *S. officinalis* against reactive oxygen species (ROS). Data from the current work will be exploited as to test the antibacterial properties of sage infusions using the classical agar diffusion well-variant test.

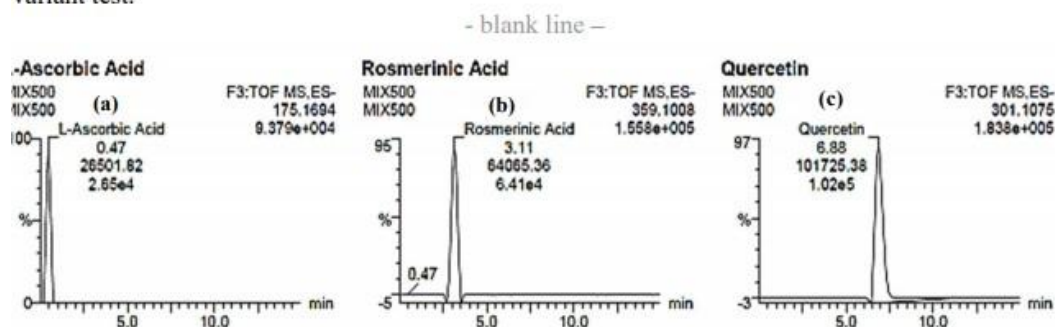



Figure 1. Retention time (RT) of reference compounds (a) L-Ascorbic acid, (b) Rosmarinic acid and (c) Quercetin used in method development of sage polyphenols.

Kuwait Conference of Chemistry - 2018

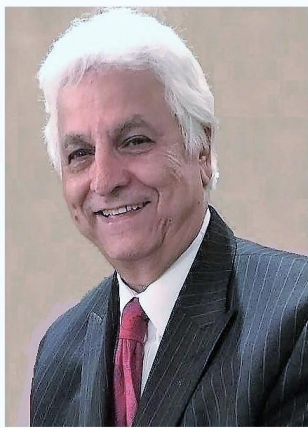


Speakers C.V's

Opening Speaker

| | | |
|---|---|---|
|  | Name | Prof. Nouria A. Al-Awadi |
| | Presentation Title | DRIVING FORWARD THE HIGHER EDUCATION REFORM : THE VITAL ROLE OF THE NATIONAL BUREAU FOR ACADEMIC ACCREDITATION AND EDUCATION QUALITY ASSURANCE (NBAQ) |
| | Affiliation | Inaugural General Director – NBAQ, Kuwait |
| | Job Title | Professor |
| | Contacts Address Phone Email Web Page | Chemistry Department Faculty of Science Kuwait University P.O.Box 5969 13060 Safat Kuwait www.kuniv.academia.edu/DrNouriaAlAwadi |
| Education | <ul style="list-style-type: none"> • Ph.D. degree in Chemistry from the University of Kent at Canterbury, UK | |
| Work Experience | <ul style="list-style-type: none"> • Director General - National Bureau for Academic Accreditation & Education Quality Assurance (NBAQ). • Vice President for Academic Affairs – Kuwait University • Dean of the Faculty of Science • Head of Chemistry department • Postdoctoral Fellowship at the School of Chemistry and Molecular Sciences, Sussex University. | |
| Awards | <ul style="list-style-type: none"> • Kuwait Foundation for the Advancement of Sciences (KFAS) • Distinguished Researcher Award in Basic & Applied Sciences • Distinguished Woman in Chemistry by the International Union of Pure & Applied Chemistry (IUPAC) | |


Plenary Lecture (PL-

| | | |
|---|---|--|
|  | Name | G.Ali MANSOORI |
| | Presentation Title | Advances in characterization, production and applications of diamondoid molecules |
| | Affiliation | University of Illinois at Chicago |
| | Job Title | Professor Em. of Bio & Chemical Engineering |
| | Contacts Address s Phone Email Web Page | UIC, 851 S. Morgan St. (M/C 063), Chicago, IL 60607-7052, USA +1-312-996-5592 mansoori@uic.edu ; gali.mansoori@gmail.com http://mansoori.people.uic.edu |
| Education | <ul style="list-style-type: none"> • Postdoctoral Fellow, Rice University • PhD, Chem. Eng.g, University of Oklahoma • MSc, Chem. Eng.g, University of Minnesota • MSc, Chem. Eng.g, University of Tehran | |
| Work Experience | <ul style="list-style-type: none"> • Professor of Bio & Chemical Engineering and Physics, UIC, USA • Consultant with Argonne National Lab, USA • Consultant with NIST, USA • Visiting professor at ITB, Indonesia, Kashan & Sharif Universities, Iran • Research collaborator with CNR-Pisa, Italy and China Petroleum University, China | |
| Awards | <ul style="list-style-type: none"> • Medal of Fundamental Science (<i>UNESCO</i>) • Award (<i>for Scientific Achievements</i>), Iran • Dedicated Service Award (<i>F&PD-AIChE</i>), USA | |

Plenary Lecture (PL-

| | | |
|---|--|---|
|  | Name | Norbert J. Pienta |
| | Presentation Title | Using Evidence-based Research to Inform Teaching: Studying Student Problem-solving using Technology and Eye Tracking |
| | Affiliation | University of Georgia (USA) |
| | Job Title | Professor |
| | Contacts | <p>Prof. Norbert J. Pienta, Ph.D. Department of Chemistry University of Georgia 140 Cedar St. Athens, GA 30602</p> <p>Phone: 706-542-6559 Email: npienta@uga.edu URL: http://www.chem.uga.edu/people/faculty/npienta</p> |
| Education | <ul style="list-style-type: none"> • 1978-80: Postdoctoral, University of Pittsburgh and Duke University, with E.M. Arnett (Calorimetry of superacid systems and carbocation formation) • 1974-8: Ph.D., Univ. of North Carolina at Chapel Hill, "The Photochemistry of Alkyl Dihalides" with P.J. Kropp • 1970-74: B.S. (Chemistry), University of Rochester | |
| Work Experience | <ul style="list-style-type: none"> • Professor (Chemistry), University of Georgia; Director of General Chemistry Instruction; • Editor, Journal of Chemical Education (9/09 – 8/19) • Professor (Chemistry), University of Iowa; Director of Undergraduate Studies (Chemistry) • Director of Undergraduate Curriculum Development (Chemistry), Univ. of North Carolina at Chapel Hill; Director of Laboratories (Chemistry), 1992-7 • Assistant & Associate Professor (Chemistry), University of Arkansas, Fayetteville, AR | |
| Awards | <ul style="list-style-type: none"> • 2010: President and Provost Award for Teaching Excellence • 2008: National Center for Academic Transformation, Redesign Scholar • 2006: College of Arts and Science Faculty Teaching Award | |


Plenary Lecture (PL-

| | | |
|---|---|---|
|  | Name | Omar Abou El Seoud |
| | Presentation Title | Education for Sustainable Development for Undergraduate and High-school Students: Learning Theory from Experimental |
| | Affiliation | University of Sao Paulo, Brazil |
| | Job Title | Professor |
| | Contacts Address Phone Email Web Page | Institute of Chemistry, The University of São Paulo, Av. Prof. Lineu Prestes 748, 05508-000, São Paulo, S.P., Brazil. (55-11) 999-499-610 E.mail: elseoud@usp.br |
| Education | <ul style="list-style-type: none"> • Ph.D. University of São Paulo, SP, Brazil • M.Sc. University of Ain-Shams, Cairo, Egypt, • B.Sc. University of Ain-Shams, Cairo, Egypt. | |
| Work Experience | <ul style="list-style-type: none"> • Lecturer in Chemistry, Texas A&M University, College Station, Texas, USA. • Alexander von Humboldt Research Fellow, Universidade de Bayreuth, Germany. • Assistant Professor, University of São Paulo, SP, Brazil • Associate Professor, University of São Paulo, SP, Brazil • Full Professor of Chemistry, University of São Paulo, SP, Brazil | |
| Awards | <ul style="list-style-type: none"> • Holder of the National Award of Scientific Achievement, 2007 • Member of the Advisory Board, J. Colloid Interface Science, 2000-2003. • National Representative, IUPAC Commission on Physical Organic Chemistry, 1998-2002. | |


Plenary Lecture (PL-

| | | |
|---|---|---|
|  | Name | Prof. Jassim Al-Hassan |
| | Presentation Title | Exciting Discoveries Utilizing Materials from the Skin of the Catfish <i>Arius Bilineatus</i>, Val. in the Novel Treatment of Diseases That are Unresponsive to Conventional Treatment |
| | Affiliation | Kuwait University |
| | Job Title | Professor |
| | Contacts Address Phone Email Web Page | Kuwait University Jassim5577_@hotmail.com |
| Education | Ph.D. from University of Wales, Swansea, U.K. | |
| Work Experience | <ul style="list-style-type: none"> • Dean of Faculty of Science, March 2014 – Sept.2016 • Professor, Biochemistry Dept., Kuwait University, 1987-to date. • Head of Biochemistry Dept., Kuwait University, March 1986-June 1997. | |
| Research Interests | <ul style="list-style-type: none"> • Proteins, Lipids, • Biochemistry and Pharmacology of Some Marine Organisms, • Anti-cancer, • Anti-Inflammatory Research, • Toxins, • Environmental Pollution | |


Plenary Lecture (PL-

| | | |
|---|--|--|
|  | Name | Peter Q. Tranchida |
| | Presentation Title | An Innovational 5-Dimensional System (LC-GC×GC-MS/MS) for the Analysis of Petroleum Derivatives |
| | Affiliation | University of Messina, Italy |
| | Job Title | Associate Professor |
| | Contacts | Address Phone Email Web Page |
| Education | <ul style="list-style-type: none"> • December 1993: Master's Degree in "Pharmaceutical Chemistry and Technology", at the University of Messina (Italy) • January 2006: PhD in "Food Chemistry and Safety" (three-year course), at the University of Messina • December 2005-November 2006: Post-doctorate position with a project entitled "Analytical Methods for Research and Development of Pharmaceuticals", at the University of Messina | |
| Work Experience | <ul style="list-style-type: none"> • August 1994-December 2002: chemistry analyst and HACCP responsible in an industrial mill (Molini Gazzi, Messina) • December 2006-March 2011: Assistant Professor in Food Chemistry at the University of Messina • March 2011, until today: Associate Professor in Food Chemistry at the University of Messina | |
| Awards | <ul style="list-style-type: none"> • In 2012, at the 9th GC×GC Symposium held in Riva del Garda (Italy), I received the "John Phillips Award" for "outstanding achievements in the GC×GC field" | |


Plenary Lecture (PL-6)

| | | |
|---|--|--|
|  | Name | MIGUEL A. BAÑARES |
| | Presentation Title | Spectroscopy during catalysis: the <i>operando</i> methodology to understand structure-activity relationships |
| | Affiliation | CSIC – ICP, INSTITUTE FOR CATALYSIS |
| | Job Title | FULL RESEARCH PROFESSOR |
| | Contacts Address Phone Email Web Page | Marie Curie 2 E-28049-Madrid, SPAIN Tel. (+34) 91 585 4788 miguel.banares@csic.es https://orcid.org/0000-0003-3875-4468 |
| Education | <ul style="list-style-type: none"> • 1992, PhD, Chemistry, Universidad de Salamanca, Spain • 1988, Bachelor, Chemistry, Universidad de Salamanca, Spain • • | |
| Work Experience | <ul style="list-style-type: none"> • since 2008, Full Research Professor at CSIC, Institute for Catalysis • since 2009, Associate Editor, CATALYSIS TODAY, Elsevier • 2014-2015, Deputy Vice-President CSIC, Spanish National Research Council. Spain • 1995-2008, Scientist, CSIC, Institute for Catalysis, Spain • 1993-1994, Research Associate, University Notre Dame, IN, USA • 1992, Visiting Scientist, Lehigh University, PA, USA | |
| Awards | <ul style="list-style-type: none"> • 2017 DOCTOR HONORIS CAUSA, Université de Caen Normandie, France • 2014 Distinguished “Otto Mønsted” Visiting Professor, Denmark Technical University, Chemistry, Denmark • 2013-2015 Chaire d’excellence, at Université Caen – CNRS, France • 2000, "Young Scientist Award" by the IACS (International Association of Catalysis Societies) | |


Invited Lecture (IL-

| | | |
|---|---------------------------|--|
|  | Name | Mohamed Abd El-Gawad Zayed |
| | Presentation Title | Preparation and Characterization of Novel Magnetic ZnFe₂O₄-Hydroxyapatite Core-Shell Nanocomposite and Its Use as Fixed Bed Column System for Removal of Oil Residue in Oily Wastewater Samples |
| | Affiliation | Chemistry Department, Faculty of Science, Cairo University |
| | Job Title | Prof. of Inorganic and Analytical chemistry |
| | Contacts | |
| | Address | Chem. Depart. Faculty of Science, Cairo Univ. |
| | Phone | Giza EGYPT, P.O. 12613 |
| | Email | Tel: 002-02-22728437, 002-01005776675, |
| | Web Page | Fax: 002-02-35728843 |
| | | <u>mazayed429@yahoo.com</u>, |
| | | <u>www.mazayed.com</u> |
| Education | Maximum 4 | <ul style="list-style-type: none"> • B.Sc. Special Chem. Honors 1969 (Cairo University). • M.Sc. Analytical Chem. 1972 (Cairo University). • Ph.D. Inorganic and Analytical Chemistry 1975 (Cairo University). • D.Sc. Analytical Chemistry 2010 (Cairo Univ. Via Royal Society of Chem. England). |
| Work Experience | Maximum 5 | <ul style="list-style-type: none"> • Air analysis and air quality, analysis of major and minor elements water quality in resources. • Rare earths in geological ores and minerals. • Mathematical modeling of pollution problems. • Analysis of pharmaceutical materials, biological activities and molecular docking. • Soil analysis, analysis of natural and synthetic solid state materials (simple compounds and complexes). |
| Awards | Maximum 3 | <ul style="list-style-type: none"> • Cairo University Distinction Prize (Anal Chem) 1978. • Cairo University Valuable Prize (Chemistry Basic Science) 2013. • Cairo University Distinction Prize (Chemistry Advanced Technology) 2016. |

Invited Lecture (IL-

| | | |
|---|--|---|
|  | Name | Saad Ali Makhseed |
| | Presentation Title | Highest Singlet Oxygen Generator Based on Phthalocyanines in Aqueous Media |
| | Affiliation | Kuwait University |
| | Job Title | Full Professor |
| | Contacts Address Phone Email Web Page | <ul style="list-style-type: none"> • Kuwait University, Faculty of Science, Chemistry - Department, P.O. Box 5969, Safat 13060, Kuwait. • Office: (+965) 24985538. • E-mail: saad.makhseed@ku.edu.kw. |
| Education | <ul style="list-style-type: none"> • Ph.D., Chemistry Department, Manchester University, UK, 2001. Thesis: <i>Synthesis and Characterization of Phthalocyanine Containing Polymers and Soluble Spiropolymers</i>. • M.Sc., Chemistry Department, Manchester University, UK, 1997. Thesis: <i>Langmuir-Blodgett Film formation from Derivatives of Octadecene-maleic anhydride Copolymer</i>. • B.Sc., Department of Chemistry, Kuwait University, Kuwait, 1995. | |
| Work Experience | <ul style="list-style-type: none"> • Microporous organic crystals with in-built catalytic sites. • Organic hydrogen-storage materials for clean fuel applications. • Polymer membranes for water purification and gas separations. • Design and synthesis of water soluble phthalocyanines potent for photodynamic therapy. • Photophysical studies for phthalocyanine compounds. | |
| Awards | <ul style="list-style-type: none"> • Best Young Researcher Award of Kuwait University, 2005. • Recipient of the Prestigious KFAS Research Productivity Award, Kuwait Foundation for the Advancement of Science, Kuwait, 2010. • Best Senior Researcher Award of Kuwait University, 2016. | |


Invited Lecture (IL-

| | | |
|---|--|---|
|  | Name | Professor David Read |
| | Presentation Title | Chemistry Education in the 21st Century – meeting the challenge |
| | Affiliation | University of Southampton, UK |
| | Job Title | Professorial Fellow in Chemical Education |
| | Contacts Address Phone Email Web Page | University of Southampton (B30:4047) Highfield Southampton UK SO17 1BJ |
| Education | <ul style="list-style-type: none"> • Qualified Teacher Status, West Berks Training Partnership, 2004. • Ph.D in organic chemistry, University of Bristol, UK, 2000. • B.Sc (1st class (hons)) in Chemistry, University of Bristol, UK, 1996. | |
| Work Experience | <ul style="list-style-type: none"> • Teaching Fellow in Chemistry, University of Southampton, UK 2007 – present. • Science Teacher, Theale Green School, Theale, UK, 2003 - 2007. • Postdoctoral Researcher in Chemistry, Washington University in St. Louis, USA, 2000 - 2002. | |
| Awards | <ul style="list-style-type: none"> • National Teaching Fellowship (HEA, 2017) • Most Effective Use of Video (ALT, 2010) • Higher Education Teaching Award (RSC, 2010) | |


Invited Lecture (IL-

| | | |
|---|--|--|
|  | Name | Dr. Badrul Huda Khan |
| | Presentation Title | Meaningful Integration of Learning Technologies in Chemistry |
| | Affiliation | McWeadon Education, USA |
| | Job Title | Author, Educator and Consultant |
| | Contacts Address Phone Email Web Page | McWeadon Education, USA badrulkhan2003@yahoo.com http://BadrulKhan.com/ |
| Education | <ul style="list-style-type: none"> ● Ph.D. in Instructional Systems Technology from Indiana University, Bloomington, USA ● BSc - Indiana University, Bloomington, USA | |
| Work Experience | <p>He served as the founding Director of the Educational Technology Leadership graduate cohort program at The George Washington University and the University of Texas, Brownsville.</p> <p>He authored twelve books and over 100 manuscripts in e learning. He was credited with coining the phrase “Web-based instruction” and popularized the concept through his 1997 best-selling book, Web-Based Instruction, which paved the way for the emerging field of e-learning. His books have been translated into 19 languages. Often described as the founder of modern e learning, Dr. Khan was inducted into the United States Distance Learning Association (USDLA) 2015 Hall of Fame. He has served as a consultant to US government agencies, World Bank, UNDP, NATO, COL, ADB, and Ministry of Education in several countries. Dr. Khan has delivered numerous international keynote addresses on e learning. He is the host of Khan’s Digital World, a monthly TV show that addresses critical issues in all aspects of everyday life.</p> | |


Invited Lecture (IL-

| | | |
|---|--|--|
|  | Name | Haider A. j. Al Lawati |
| | Presentation Title | “Lab on a paper” a promising approaches for teaching chemistry in schools |
| | Affiliation | Sultan Qaboos University, Sultanate of Oman |
| | Job Title | Associate Professor |
| | Contacts Address Phone Email Web Page | Box 36, Al-Khod 123, Oman 0096824141481 haiderl@squ.edu.om and haider0aj@gmail.com https://haider0aj.wixsite.com/haider |
| Education | <ul style="list-style-type: none"> • Ph.D in Chemistry, Chemistry Department, University of Hull, Hull, England, 2007 . • Postgraduate Certificate in Research Training, University of Hull, Hull, England, 2006 . • M.Sc in Analytical Chemistry, Birkbeck College, University of London, England, 1997. • B.Sc. in Chemistry, Chemistry Department, College of Science, Sultan Qaboos University, Sultanaate of Oman, 1993 | |
| Work Experience | <ul style="list-style-type: none"> • September 2017 – Associate Professor at Chemistry Department, College of Science, Sultan Qaboos University. • September 2014 – August 2017, Head of Department of Chemistry, College of Science, Sultan Qaboos University. • May 2013 – August 2014 Associate Professor at Chemistry Department, College of Science, Sultan Qaboos University. • December 2007 – May 2013, Assisntant Professor at Chemistry Department, College of Science, Sultan Qaboos University | |
| Awards | <ul style="list-style-type: none"> • National Research Award in the research area Culture, Basic and Social Sciences, 5th October 2016, TRC-Oman. • First GCC award of excellence in Chemistry, 7th December 2015 • Best innovation Award, Oman Innovation Exhibition, 2011. | |

Invited Lecture (IL-6)

| | | |
|---|---|---|
|  | Name | Dr. Mat Uzir Wahit |
| | Presentation Title | Bionanocomposite regenerated cellulose films using ionic liquid solvent |
| | Affiliation | <i>Universiti Teknologi Malaysia (UTM), Malaysia.</i> |
| | Job Title | Professor |
| | Contacts Address Phone Email Web Page | <i>Department of Bioprocess and Polymer Engineering, Faculty of Chemical and Energy Engineering, Universiti Teknologi Malaysia (UTM), Johor Bahru, Malaysia. +6012-7012001 r-uzir@utm.my, mat.uzir@cheme.utm.my</i> |
| Education | <ul style="list-style-type: none"> • 2006 - Doctor of Philosophy in Polymer Nanocomposites Universiti Sains Malaysia • 1999 - Master of Engineering in Polymer Composites Universiti Teknologi Malaysia • 1994 - Bachelor of Technology in Polymer Technology Universiti Sains Malaysia | |
| Work Experience | <ul style="list-style-type: none"> • 2006-2007- Lecturer in Polymer Engineering, UTM • 2007-2008 - Senior Lecturer in Polymer Engineering, Universiti Teknologi Malaysia • Dec 2008-May 2009 - Post Doctoral Fellow, Materials Engineering, MONASH University, Australia • 2008-2015 - Associate Professor in Polymer Engineering / Polymer Composites, UTM • 2015- current – Professor in Polymer Engineering / Polymer Composites, UTM | |
| Awards | <ul style="list-style-type: none"> • 2001 - Japan International Cooperation Agency (JICA) scholarship for High Performance Polymer Technology courses at Osaka, Japan • 2006, 2010, 2015 - Excellent Services Award by UTM • 2008-2009 - Post-Doctorate Merit Scholarship Awarded by Islamic Development Bank (IDB) at MONASH University, Melbourne. | |

Invited Lecture (IL-

| | | |
|---|---|--|
|  | Name | Dr. Abdulilah Dawoud Bani-Yaseen |
| | Presentation Title | Lab-on-a-Chip Technology for Chemical & Biomedical Analyses: Fundamentals, Recent Progress, and Future Perspectives |
| | Affiliation | Qatar University |
| | Job Title | Associate Professor of Chemistry |
| | Contacts Address Phone Email Web Page | Department of Chemistry & Earth Sciences College of Arts & Sciences, Qatar University P.O. Box: 2713, Doha, State of Qatar abdulilah.baniyaseen@qu.edu.qa |
| Education | <ul style="list-style-type: none"> • PhD, Iowa State University of Sci. & Tech., USA; 2006. • MSc, Jordan University of Sci. & Tech., Jordan; 2001. • BSc, Yarmouk University, Jordan; 1998. | |
| Work Experience | <ul style="list-style-type: none"> • Qatar University, State of Qatar; 2013-present • Taibah University, Kingdom of Saudi Arabia; 2007-2013. • Virginia Tech, USA; 2006-2007 | |
| Awards | <ul style="list-style-type: none"> • 1st award for the best paper and oral presentations at 2nd <i>International Conference on Nanotechnology Modeling and Simulation (ICNMS'17)</i>, 2017, Barcelona, Spain. • 1st award for the best oral presentations at the 3rd <i>International Conference and Exhibition on Laboratory Technology (LABTECH)</i>, 2014, Manamah, Kingdom of Bahrain. • Scientific Research Award for published articles, Taibah University, Medina, Kingdom of Saudi Arabia, 2013. | |


Invited Lecture (IL-

| | | |
|---|---|--|
|  | Name | Prof. Abdulrahman Abdullah Al-Warthan |
| | Presentation Title | Plant Extract Mediated Eco-Friendly Synthesis of Pd@Graphene Nanocatalyst: An Efficient and Reusable Catalyst for the Suzuki-Miyaura Coupling |
| | Affiliation | King Saud University |
| | Job Title | Professor of Analytical Chemistry |
| | Contacts Address Phone Email Web Page | Department of chemistry, College of Science, King Saud University, Riyadh, 11451, Kingdom of Saudi Arabia. 00966505227301 awarthan@ksu.edu.sa http://fac.ksu.edu.sa/awarthan |
| Education | <ul style="list-style-type: none"> • Ph.D. (Doctorate of Philosophy) in Chemistry | |
| Work Experience | <ul style="list-style-type: none"> • Editor-in-chief of Arabian Journal of Chemistry. • Director of Chemical & Biological Pollution Protection Committee, KSU. • Member of Saudi Chemical Society Council. • Associate editor-in-chief for Arabian Journal of Forensic Sciences and Forensic Medicine. • Member of the International Advisory Board for the Jordan Journal of Chemistry. | |


Invited Lecture (IL-

| | | |
|---|---|---|
|  | Name | Afshin Hadipour |
| | Presentation Title | Smart materials for energy saving applications |
| | Affiliation | imec |
| | Job Title | Senior Scientist |
| | Contacts Address Phone Email Web Page | Kapeldreef 75, 3000 Leuven, Belgium Work: +3216281410 ; Mobile: +32491983384 hadipour@imec.be www.imec.be |
| Education | <ul style="list-style-type: none"> • Dates (from – to) January 2008 – Present • employee imec, Belgium • Title of qualification Senior Scientist (Thin film electronics) • Dates (from – to) September 2003 – December 2007 • University/College University of Groningen, The Netherlands • Title of qualification awarded Doctorate of Philosophy in Physics Thesis: Organic tandem solar cells • Dates (from – to) September 2000 – September 2003 • University/College University of Groningen, The Netherlands • Title of qualification awarded Master's of Science in Theoretical and Applied Physics Focus: solid state (crystal) and superconductivity • Dates (from – to) September 1998 – September 2000 • University/College University of Groningen, The Netherlands • Title of qualification awarded Bachelor's of Science in Physics | |
| Work Experience | <ul style="list-style-type: none"> • Designed and built novel single or integrated multi-junction opto-electronic devices • <i>Designed and build flexible (transparent) electrodes for large area applications</i> • <i>Material search (metal oxides, metals and polymers) for electrode applications</i> • <i>Characterized electrical and optical performance of various electronic devices</i> • Developed mathematical models and performed optical simulations for PV and LED devices | |
| Awards | <ul style="list-style-type: none"> • Reward: Outstanding Poster Award, MRS Fall meeting Boston USA 2004: The first solution-processed organic tandem solar cell is reported with non-overlapping absorption spectrum. | |


Invited Lecture (IL-10)

| | | |
|---|---|--|
|  | Name | Talat Saeed |
| | Presentation Title | Plastics and Microplastics in Kuwait Coastal Areas: An Emerging Pollutant |
| | Affiliation | Kuwait Institute for Scientific Research |
| | Job Title | Research Scientist |
| | Contacts Address Phone Email Web Page | P. O. Box 24885, Safat-13109, Kuwait 24989195, 99918452 tsaeed@kisir.edu.kw |
| Education | <ul style="list-style-type: none"> • B.Sc (Honours), University of the Punjab, Lahore, Pakistan • M.Sc. University of the Punjab, Lahore, Pakistan • Ph.D. State University of Ghent, Ghent, Belgium • | |
| Work Experience | <ul style="list-style-type: none"> • Post-Doctoral Fellow. Chemistry Dept., Indiana University, USA • Head of Chromatography Laboratory, KISR (1982-1990) • Environmental Sciences Dept., KISR (1992-2003) • Midas Chemical Industries, Lahore, Pakistan (2003-2009) • Research Scientist, Environment and Life Sciences Research Center, KISR (2009-present) | |
| Awards | <ul style="list-style-type: none"> • Associate Editor, <i>Aquatic Ecosystem Health & Management</i> • Member Scientific Committee “Gulf-II International Conference on The State of Gulf Ecosystem, Functioning & Sustainability”. Kuwait 7-9 February, 2011. • Reviewer: <i>Environmental Science & Technology, Journal of Hazardous Materials, Journal of Chemical Society of Pakistan, Science International, Aquatic Ecosystem Health & Management, Journal of Ecology and the Natural Environment, Journal of Environmental Chemistry and Ecotoxicology, Soil and Sediment Contamination, Science of Total Environment.</i> | |


Oral Lecture (OL-

| | | |
|---|---|---|
|  | Name | Bedoor K. Alnasser |
| | Presentation Title | The effect of different beverages on the surface structure of orthodontic Nano-hybrid composites . |
| | Affiliation | Ministry of Education |
| | Job Title | Teacher . |
| | Contacts Address Phone Email Web Page | Kaifan City – Kuwait 965 51171136 Orgoan2014@gmail.com |
| Education | Maximum 4 <ul style="list-style-type: none"> • Bachelor degree from the Faculty of Education – Kuwait University • (Chemistry/Biology .) 2006 • Certified International Trainer – Cambridge Training Academy. • Lecturer in Personal Styles . • Lecturer in Body language reading . • • | |
| Work Experience | Maximum 5 <ul style="list-style-type: none"> • • 11 years as a teacher – Ministry of Education . • • • | |
| Awards | Maximum 3 <ul style="list-style-type: none"> • • • | |


Oral Lecture (OL-

| | | |
|---|--|--|
|  | Name | Halema Ali Al-Kandari |
| | Presentation Title | Titanium nanocomposites-based catalysts in wastewater treatment |
| | Affiliation | Public Authority for Applied Education and Training (PAAET) |
| | Job Title | Associate Professor |
| | Contacts Address Phone Email Web Page | College of Health Sciences Department of Health Environment P.O. Box 14281, Faiha 72853, Kuwait ha1.alkandari@paaet.edu.kw halecatalysis@yahoo.com |
| Education | <ul style="list-style-type: none"> • 2000-2005 Doctor of Philosophy with High Honors in Department of Chemistry. GPA is 3.93 on a scale of 4 points, Department of Chemistry, Faculty of Science, Kuwait University, Kuwait • 1996-2000 Master of Science with High Honors in Department of Chemistry. GPA is 3.74 on a scale of 4 points Department of Chemistry, Faculty Science, Kuwait University, Kuwait • 1992-1995 Bachelor Degree in Chemistry. GPA is 3.47 on a scale of 4 points, Department of Chemistry, Faculty Science, Kuwait University, Kuwait | |
| Work Experience | <ul style="list-style-type: none"> • Involved in many research projects in surface science, catalysis, photocatalysis and wastewater treatments. Published more than 30 Peer Reviewed Journal articles and have more than 30 accepted oral and poster presentations in the national and international conferences. • 5th Feb 2015- Present Associate Professor and from 14th Feb. 2010-5th Feb 2015, Assistant Professor, Department of Health Environment, College of Health Science, The Public Authority of Applied Education and Training (PAAET), Kuwait. • Reviewed many articles in the international journals and supervising Ph.D. student • 19th Feb. 2003-14th Feb.2010, Teaching Assistant, Department of Chemistry, Faculty of Science, Kuwait University, Kuwait. | |
| Awards | <ul style="list-style-type: none"> • Scientific Production Prize for year 2016 in Physical Sciences and Mathematics. Kuwait Foundation of the Advanced of Science (KFAS). • Prestigious IAAM Scientist Medal of year 2016 and membership card for notable and outstanding research in the advanced materials science and technology. It was given during award ceremony of International association of Advanced Materials held on 24 August 2016 at seaside Auditorium, M/S Mariella, Helsinki, Finland. • many of research reward from PAAET and Kuwait University for published papers of high impact factor and for evolution of final reports of the project. | |


Oral Lecture (OL-

| | | |
|---|--|---|
|  | Name | Dr. Gowhar Ahmad Naikoo |
| | Presentation Title | “Fabrication of Highly Efficient Non-Enzymatic Glucose Sensor Composed of NiO@SiNps Composite Materials” |
| | Affiliation | Department of Mathematics and Sciences, College of Arts and Applied Sciences (CAAS), Dhofar University, Salalah, Oman |
| | Job Title | Lecturer |
| | Contacts Address Phone Email Web Page | Dhofar University, Salalah, Oman +968 96158220 naikgowhar@gmail.com / gahmed@du.edu.om Research gate: https://www.researchgate.net/profile/Gowhar_Naikoo |
| Education | <p>Ph.D. Chemistry India Dr. Hari Singh Gour University, Sagar, India Year: 2016 Specialization: Materials Chemistry Thesis Title: “Synthesis and Characterization of Nanoporous Materials of Some Metals Using Surfactants”</p> <p>M.Sc. Chemistry Jiwaji University, Gwalior (M. P.), India Duration: 2007-2009 Specialization: Physical Chemistry Division: First</p> <p>B.Sc. Science University of Kashmir (J&K) India Duration: 2003-2007 Major Subject: Chemistry Division: First</p> | |
| Work experience | <p>2017 – Present Lecturer at Department of Mathematics and Sciences, College of Arts and Applied Sciences (CAAS), Dhofar University, Salalah, Oman</p> <p>2015 – 2016 Instructor at Department of Mathematics and Sciences, College of Arts and Applied Sciences (CAAS), Dhofar University, Salalah, Oman</p> <p>2012 - 2014 Guest Faculty at Dr. Hari Singh Gour University (A Central University), Sagar. M. P. India</p> | |
| Awards | <ul style="list-style-type: none"> ➤ CSIR-SRF award (Council of Scientific and Industrial Research Award-India) September 2015 ➤ Two times M. P. India Young Scientist Congress has awarded me fellowship for Training for young scientists (FTYS) (2013 and 2014) ➤ Secured University First Rank in M.Sc. Chemistry (Specialization: Physical Chemistry) | |


Oral Lecture (OL-

| | | |
|---|--|---|
|  | Name | Prof. Mama El Rhazi |
| | Presentation Title | Determination of carbaryl at modified carbon paste electrode by low silica x zeolite or polymeric film |
| | Affiliation | Laboratory of Materials, Membranes and Environment, Faculty of Sciences and Technologies -BP 146 Mohammedia 20650, University Hassan II of Casablanca, Morocco. |
| | Job Title | Full Professor |
| | Contacts Address Phone Email Web Page | Faculty of Sciences and Technologies – Mohammedia – Department of Chemistry- BP146- 20650 Morocco elrhazim@hotmail.com www.fstm.ac.ma |
| Education | <ul style="list-style-type: none"> • MSc Honours in Electrochemistry from the University Pierre et Marie curie - France • PhD in electrochemistry in 1992 from the University Pierre et Marie curie - France • Second PhD in “Environment and process engineering” in 1996 From School of engineering of Mohammedia - Rabar | |
| Work Experience | <ul style="list-style-type: none"> • Invited as associate professor in university of Cergy-Pontoise – France, during 1994 and 1996 • Full Professor In Faculty of Sciences and technologies – Mohammedia • President of Moroccan Society of Analytical chemistry since 2010 | |
| | <ul style="list-style-type: none"> • President of Arab Union of chemist in 2016 • President of Federation of African Societies of Chemistry since September 2017 | |

Oral Lecture (OL-

| | | | | |
|---|--|---|---|----------------|
|  | Name | | Dr. Muhammad Zahid Qureshi | |
| | Presentation Title | | Green Synthesis of Iron oxide Nanoparticles using Orange peels extract and Their Application as a Tool For Drug Delivery | |
| | Affiliation | | Government College University Lahore Pakistan. | |
| | Job Title | | Professor | |
| | Contacts Address Phone Email Web Page | | Department of Chemistry, GC University Lahore, Pakoistan. +92 334 7599729, dr.zahidqureshi@gcu.edu.pk www.gcu.edu.pk | |
| Education | Postdoc | Brunel University London, United Kingdom | Bio-nanotechnology | 2013 |
| | Ph.D. | Quaid-i-Azam, University Islamabad | Natural Sciences | 2003 |
| | M.Phil. | Quaid-i-Azam, University, Islamabad | Biochemistry | 1992 |
| | M.Sc. | Punjab University Lahore (Govt. College Lahore) | Chemistry | 1989 |
| Work Experience | | | Period | |
| | Institution | Position Held | From | To |
| | GC University Lahore | Professor | 11-02-2017 | Present |
| | GC University Lahore | Associate Professor | 01-05-2012 | 10-02-2017 |
| | GC University Lahore | Assistant Professor | 24-05-2005 | 30-04-2012 |
| | Education Department Govt. of the Punjab | Lecturer in Chemistry | 18-12-1989 | 23-05-2005 |
| Awards | <ul style="list-style-type: none"> • Discovered Novel species of Bacteria Published by: National Center for Biotechnology Information (NCBI), USA. • Contributed in three international books • Teacher of the Year Award | | | |

Oral Lecture (OL-

| | | |
|---|--|--|
|  | Name | Manee AlManea |
| | Presentation Title | To what extent do Science Teachers fulfil Teaching Competency from the point of view of the head of science department in middle schools In the State of Kuwait |
| | Affiliation | Ministry of Education |
| | Job Title | Science Supervision |
| | Contacts Address Phone Email Web Page | P.O box 1456 code 01016 Aljahra Kuwait 66830414 mnsdmm@yahoo.com |
| Education | <ul style="list-style-type: none"> • Ph.D Curricula and Teaching | |
| Work Experience | <ul style="list-style-type: none"> • 26 years Ministry of Education | |

Oral Lecture (OL-7)

| | | |
|---|---|--|
|  | Name | Nouf Al-Hamdan |
| | Presentation Title | Chemistry: From the Past to the Future. (in Arabic language) |
| | Affiliation | Kuwait University |
| | Job Title | PhD Student |
| | Contacts Address Phone Email Web Page | Mubarak AlKabeer (Kuwait) 66687008 noufsalhamdan@gmail.com --- |
| | Nationality | Kuwaiti |
| Education | <ul style="list-style-type: none"> • BSc Chemistry • MSc Organic Chemistry | |
| Work Experience | <ul style="list-style-type: none"> • Mubarak AlKabeer Hospital (Medical Lab.). • Occupational Medical Center (Medical Lab.). • AbuHalifa Medical Center (Medical Lab.). • Taj Rayan Company (Administration). | |
| Awards | <ul style="list-style-type: none"> • --- • --- • --- | |

Arabic Lecture

| | | |
|---|--|---|
|  | Name | Dr. Abdullah Alfaiakawi |
| | Presentation Title | The Augmented Reality Applications in Teaching and Learning Sciences |
| | Affiliation | Kuwait University – College of Education |
| | Job Title | Assistant Professor |
| | Contacts Address Phone Email Web Page | alfaiakawi@yahoo.com |
| Education | <ul style="list-style-type: none"> • Bachelor in education, college of education, Kuwait University – 2003 • Master of Science, Indiana State University, 2007 Major: Curriculum, Instruction & Media Technology with specialization in Educational Technology • Doctor of Philosophy, Indiana State University, 2011 Major: Curriculum, Instruction & Media Technology with specialization in Educational Technology | |
| Work Experience | <ul style="list-style-type: none"> • Teacher - Ministry of Education 2003 - 2005 • TA on Scholarship – Kuwait University 2005 - 2011 • Assistant Professor – Kuwait University 2011 – Present | |
| Awards | <ul style="list-style-type: none"> • • | |


Oral Lecture (OL-8)

| | | |
|------------------------|---|---|
| | Name | Moudi Fakhri Al-Mutairi |
| | Presentation Title | Robotic Chemistry |
| | Affiliation | Kingdom of Saudi Arabia Ministry of education |
| | Job Title | Chemistry teacher |
| | Contacts Address Phone Email Web Page | High School Umm Salama Dammam modai2022@yahoo.com Email: Mobile: 96650013325 |
| Education | Bachelor of Science Specialty Chemistry | |
| Work Experience | <ul style="list-style-type: none"> • 23 years educational experience • Teaching chemistry at the secondary level • Supervisor of the Educational Excellence Club in the Kingdom • Trainer in the King Abdulaziz Foundation and his men for talent and creativity | |
| Awards | <ul style="list-style-type: none"> • a certificate of excellence in the Sheikh Hamdan Award for Excellence in Gulf Education Performance • Winner of the 2011 talent generation contest of the King Abdulaziz Foundation and its men of talent and creativity in the Kingdom • Certificates of appreciation from the universities of the Kingdom for participation in the field of chemistry | |


Oral Lecture (OL-9)

| | | |
|---|--|--|
|  | Name | Majed S. Alokail |
| | Presentation Title | Professor |
| | Affiliation | Department of Biochemistry |
| | Job Title | Department Head |
| | Contacts Address Phone Email Web Page | Department of Biochemistry, College of Science, Building 5, King Saud University, P.O. Box 2455, Riyadh 11451, Saudi Arabia Phone: +966-11-4675800 e-mail: malokail@ksu.edu.sa web: faculty.ksu.edu.sa/15400/Pages/MajedSalehAAlokail.aspx |
| Nationality | Saudi Arabia | |
| Education | Maximum 4 <ul style="list-style-type: none"> • BSc in Biochemistry • MSc in Biochemistry • Higher Diploma in Gene Therapy • PhD in Molecular Pharmacology | |
| Work Experience | Maximum 5 <ul style="list-style-type: none"> • Post-doctoral fellowship, Canadian Breast Cancer Society, department of biochemistry and molecular biology at University of Manitoba, Winnipeg, Canada • Assistant professor, biochemistry department, King Saudi University in Riyadh, Saudi Arabia. • Associate professor at biochemistry department, King Saudi University in Riyadh, Saudi Arabia. • Full professor at biochemistry department, King Saudi University in Riyadh, Saudi Arabia. • Head, department of biochemistry, King Saudi University in Riyadh, Saudi Arabia. | |
| Awards | Maximum 3 <ul style="list-style-type: none"> • American Association for Cancer Research (AACR) AVON Breast Cancer Foundation Award for a presented paper entitle " Induction of erbB1 and erB2 Receptors by PTHrP in Breast Cancer Cells" in the 96th Annual Meeting of American Cancer Research (AACR), 2005. • American Association for Cancer Research (AACR) Roche Cancer Award for a presented paper entitle " Gene array analysis of breast cancer cell lines treated with Taxotere and Ukrain". Advances in Cancer Research: From the Laboratory to the Clinic, March 16 - 19, 2008. • Abdul Hameed Shoman Foundation Award for basic science (biotechnology and bioinformatic), Amman, Jordan, 2015 | |


Oral Lecture (OL-

| | | |
|---|---|--|
|  | Name | Aymen Abdulsattar Dagher |
| | Presentation Title | New modified method for determination of nitric oxide synthase activity in plasma of vitiligo patients |
| | Affiliation | Department of Chemistry, College of Sciences, University of Baghdad, Baghdad, Iraq |
| | Job Title | Lecture |
| | Contacts | Address Phone Email Web Page |
| Education | <ul style="list-style-type: none"> • Bachelors degree in Chemistry science (2012) • Master degree in biochemistry (clinical) (2015) • Ph.D. student in biochemistry (clinical) | |
| Work Experience | <ul style="list-style-type: none"> • Lecture in Baghdad university / Chemistry department • Lecture in Usual Al-deen University College/ Medical Lab. Technique • Lecture in Alfarahidi University College / Dental Department | |

Oral Lecture (OL-

| | | |
|---|---|--|
|  | Name | Omnia Hassan Abdelraheem |
| | Presentation Title | Microwave preparation of a novel Chitosan/ACTF composite for the removal of Ca(II) and Ba(II) from underground water: adsorption modeling and optimization |
| | Affiliation | Faculty of Engineering - Beni-Suef University Egypt |
| | Job Title | Lecturer of Chemical Engineering |
| | Contacts | Address: Faculty of Engineering - Beni-Suef University New Beni- Suef City, P.O. Box: 62512 Beni- Suef, Egypt. Mobile: 002-011-11989596 Office Tel.: 002-0822246782 E-mail: omnia_hassan55@eng.bsu.edu.eg |
| Education | <ul style="list-style-type: none"> • Ph.D. Degree in Chemical Engineering - Minia University – 2011 • M.Sc. Degree in Chemical Engineering.-Minia University – 2003 • B.Sc . Degree in Chemical Engineering -Minia University – Egypt-1998 | |
| Work Experience | <ul style="list-style-type: none"> • Lecturer of Chemical Engineering -Faculty of Engineering - Beni-Suef University (2013-To date). • Researcher– PVT & Condensate Services Center– Egyptian petroleum researches institute (2011- 2013). • Assistant researcher – Analysis and Evaluation department- Egyptian petroleum researches institute (2004 – 2011). • Demonstrator- Faculty of Engineering- Minia University (1999-2004) | |


Oral Lecture (OL-

| | | |
|---|--|---|
|  | Name | Yousry Moustafa Issa |
| | Presentation Title | Effect of Different Graphite Grades on the Response Characteristics of Clomipramine Hydrochloride Sensors and its Determination in Bulk, Pharmaceutical Formulations and Biological Fluids |
| | Affiliation | Chemistry Department, Faculty of Science, Cairo University, Giza, Egypt |
| | Job Title | Professor (Emeritus) |
| | Contacts Address Phone Email Web Page | Chemistry Department- Faculty of Science, Cairo University, Giza, Egypt. 00202-01005600793 yousrymi@yahoo.com |
| Education | <ul style="list-style-type: none"> • D. Sc. Analytical Chemistry, Cairo University (2015) • Ph. D. Analytical Chemistry, Cairo University (1974) • M. Sc. Applied Chemistry, Cairo University (1971) • B. Sc. Applied Chemistry, Cairo University (1968). | |
| Work Experience | <ul style="list-style-type: none"> • Professor (Emeritus) (2005) till now. • Professor (1984-2005). • Associate professor (1979-1984) • Lecturer (1974-1979). • Instructure-Assistant lecturer (1968-1974) | |
| Awards | <ul style="list-style-type: none"> • State encouraging award in Analytical Chemistry (1989). • Medal and diploma of excellency, Egypt Arab Republic (1995). • Cairo University Award of Appreciation (2005). • Arab award of Chemistry (Saudi Chemical Society) (2010) | |


Oral Lecture (OL-

| | | |
|---|--|--|
|  | Name | Jothibasuramasamy |
| | Presentation Title | Chemical modification of waste vegetable oil for oil and gas drilling industry applications |
| | Affiliation | Saudi Aramco |
| | Job Title | Petroleum Scientist |
| | Contacts Address Phone Email Web Page | PO box 11415, Saudi Aramco, Dhahran, KSA +966 547938969; +966 13 8723472 Jothibasuramasamy@aramco.com |
| Education | <ul style="list-style-type: none"> • Ph.D in Chemistry from National University of Singapore, Singapore • MS in Applied Chemistry from Anna University, Chennai, India • BS in Chemistry from Bharathidasan University, Trichy, India | |
| Work Experience | <ul style="list-style-type: none"> • July 2013-present: Petroleum Scientist, EXPEC Advanced Research Center, Saudi Aramco • Dec2010-June2013: Post-doctoral fellow, KAUST, KSA • Jan2010-Nov2010: Research Fellow, National University of Singapore | |
| Awards | <ul style="list-style-type: none"> • First prize in research poster award at KCC, KAUST • Post-doctoral fellowship award at KAUST • Graduate student fellowship award at National University of Singapore | |

Oral Lecture (OL-

| | | |
|---|--|--|
|  | Name | Ahmet Murat GİZİR |
| | Presentation Title | Degradation of Propham in Subcritical Water Medium: Application of Box-Behnken Design |
| | Affiliation | Prof Dr |
| | Job Title | Researcher and Lecturer |
| | Contacts Address Phone Email Web Page | Mersin University Arts and Science Faculty Chemistry Department 33342 Mersin /TURKEY agizir@mersin.edu.tr http://apbs.mersin.edu.tr/agizir |
| Education | <ul style="list-style-type: none"> • PhD / Chemistry University of Leeds-United Kingdom • BSc/ Chemistry University of Çukurova-Turkey | |
| Work Experience | <ul style="list-style-type: none"> • Professor Chemistry Department-Mersin University 2012- • Visiting Scholar- East Carolina State University- 2003- 3 months • Visiting Researcher- University of North Dakota- EERC -4 months 1997 | |
| Awards | <ul style="list-style-type: none"> • 1992 Turkish Higher Education Council Scholarship | |

Oral Lecture (OL-

| | | |
|---|---|---|
|  | Name | Husain Bahzad |
| | Presentation Title | Techno-Economical assessment of H₂ production process <i>via</i> CLC technology |
| | Affiliation | Imperial College London |
| | Job Title | Research Post graduate |
| | Contacts Address Phone Email Web Page | Alsalam, block 2, street 219 house 219 , Kuwait. 0096599408256. hb3015@ic.ac.uk |
| Education | <ul style="list-style-type: none"> • B.sc Chemical Engineering (Kuwait University) • Msc. Chemical Engineering (Kuwait University) • Msc. Chemical Engineering (University of Dayton) | |
| Work Experience | <ul style="list-style-type: none"> • Analyst for the petroleum products and quality control in Kuwait petroleum corporation (2008-2009) • Teacher Assistant in Kuwait University (2009-2010) • Teacher Assistant in Australian college of Kuwait (2010-2011) • Instructor in Australian college of Kuwait (2011-2012) • Instructor in college of technological studies (2013-) | |
| Awards | <ul style="list-style-type: none"> • Deans honor list 2005 • College of engineering and petroleum honor list (2004-2008) for B.sc , (2009-2011) for M.sc | |

Oral Lecture (OL-

| | | |
|---|---|---|
|  | Name | Mustafa Kemal Sangün |
| | Presentation Title | Investigation of Hydrogen Production by using Silver Coated Platinum Electrode in Phosphate Solutions |
| | Affiliation | Mustafa Kemal University |
| | Job Title | Prof.Dr. |
| | Contacts Address Phone Email Web Page | Mustafa Kemal University, Faculty of Arts&Science Dep. of Chemistry, 31024 Antakya-Hatay / TURKEY +90 532 484 2787 ksangun@gmail.com |
| Education | <ul style="list-style-type: none"> • B.S. Chemistry - Cukurova University • Ph.D. Chemistry - University of Leeds | |
| Work Experience | <ul style="list-style-type: none"> • University of Leeds • Fachhochschule Aalen • Süleyman Demirel University • Cukurova University • Mustafa Kemal University | |
| Awards | <ul style="list-style-type: none"> • Best Paper Award 2017 (2nd International Mediterranean Science and Engineering Congress (IMSEC) Adana, 25-27 Oct. 2017) • Best Poster Award 2015 (5th Cosmetics Chemistry, Production and Standardization Congress, Antalya, February, 2015) • Best Poster Award 2013 (3rd Cosmetics Chemistry, Production and Standardization Congress, Antalya, February, 2013) | |

Oral Lecture (OL-

| | | |
|---|---|--|
|  | Name | Ideisan I. Abu-Abdoun |
| | Presentation Title | Applications of Neem Tree Products to Green Concepts |
| | Affiliation | University of Sharjah |
| | Job Title | Professor of Chemistry |
| | Contacts | Chemistry Department – College of Science Sharjah P.O. Box 27272 +971508603222 abuabdoun@sharjah.ac.ae www.sharjah.ac.ae |
| Education | High School: Hasan Albargawi -Alashrafyah - Amman B. Sc: Chemistry University of Kuwait - Kuwait Ph. D: University of Liverpool – UK | |
| Work Experience | Researcher: University of Bowling Green, Ohio. U.S.A University of Liverpool – UK University of Exeter (UK) Teaching: KFUPM–Dhahran - Saudi Arabia Al-Albeit University - Jordan University of Sharjah - UAE | |
| Awards | <ul style="list-style-type: none"> • Distinguished university and community services Awards at university of Sharjah. • Certificates of appreciation and thanks from Environmental and protected Areas Authority - Sharjah • Certificates of appreciation and thanks from Dubai and Sharjah Education Districts. | |

Oral Lecture (OL-18)

| | | |
|---|---|--|
|  | Name | Maliheh Salimi |
| | Presentation Title | Sludge production in chemical precipitation |
| | Affiliation | |
| | Job Title | Student of master of Energy, Environment and Society at University of Stavanger |
| | Contacts Address Phone Email Web Page | Peder Klows Gate 30, 4010, Stavanger, Norway 004793682129 msalimi1383@gmail.com |
| Education | Maximum 4 <ul style="list-style-type: none"> • Student of master of science, Energy, Environment and Society, August 2017-now, University of Stavanger, Norway • Master of Science, Environmental Technology, Aug. 2014 – 2016, University of Stavanger, Stavanger, Norway • Bachelor of Science, Chemical Engineering, 2001, University of Tehran, Tehran, Iran | |
| Work Experience | Maximum 5 <ul style="list-style-type: none"> • Senior Procurement Engineer, 2009-2014, Jam Petrochemical Company, Iran • Process Engineer/Senior Engineer, 2005-2009, Jam Petrochemical Company, Iran • Production Supervisor, 2001-2002, Kimia Faam Pharmaceutical Company, Tehran, Iran | |
| Awards | Maximum 3 <ul style="list-style-type: none"> • “Investigation of anthropogenic effects on soil and aquatic ecosystem”, 4th Kuwait Conference of Chemistry (KCC2016), 20-22nd March 2016, Kuwait. (poster presentation) • “Dynamic Simulation of Packed Absorption Column in Sweetening Process by Amines”, 3rd Kuwait Conference of Chemistry (KCC2014), 9th – 11th March 2014, Kuwait. (poster presentation) | |

Kuwait Conference of Chemistry - 2018



Authors

| Name | Code | Page No. |
|-------------------------------|---------|----------|
| Abd-Allah A. Helal | P-SI-44 | 128 |
| Abdulaziz NAJEM Alyoubi | P-MC-04 | 142 |
| Abdullah AlFalikawi | AL-1 | 58 |
| Abdullah Dawoud Bani-Yaseen | IL-7 | 45 |
| Abdullah Essa Al-Qamous | P-CE-4 | 76 |
| Abdulrahman A Alwarthan | IL-8 | 46 |
| Abdulsalam Alhazza | P-SI-28 | 112 |
| Abdulwahab S Almusallam | P-MC-27 | 165 |
| Abeer Abduljaleel Ibrahim | P-MC-42 | 180 |
| Abeer Najem Al-youbi | P-MC-07 | 145 |
| Abid Ahmad Erdeni | P-SI-42 | 126 |
| Abu Salim Mustafa | P-MC-34 | 172 |
| Adel Ghoneim | P-SI-02 | 86 |
| Afshin Hadipour | IL-9 | 47 |
| Ahmad A Al-Aziz AL-Qattan | P-SI-48 | 132 |
| Ahmed Abdel Nazeer | P-SI-04 | 88 |
| Ahmed Abdel Zaher A.G.Askar | P-MC-46 | 184 |
| Ahmed Abdunabi Al-Hashemi | P-CE-6 | 78 |
| Ahmed Al-Otaibi | P-SI-17 | 101 |
| Ahmed Meslam Mohamed | P-SI-10 | 94 |
| Ahmet Murat Gizir | OL-14 | 65 |
| Aida Lotfy El-Ansary | P-CE-11 | 83 |
| Alami Younssi Saad | P-MC-24 | 162 |
| Alami Younssi Saad | P-SI-49 | 133 |
| Ali Abdulkhabeer Ali Alyasiri | P-SI-14 | 98 |
| Ali Alsalmeh | P-MC-33 | 171 |
| Ali Husain | P-MC-36 | 174 |
| Ali Husain | P-SI-03 | 87 |
| Ali Larkem | P-CE-10 | 82 |
| Ali Mansoori | PL-1 | 31 |
| Amina Sultan Al-Jaber | P-SI-06 | 90 |
| Amira A. Ghoneim | P-SI-19 | 103 |
| Amira Atef M. Ghoneim | P-MC-31 | 169 |
| ANAS AlAli | P-MC-41 | 179 |
| Anwar Ayed Alshammari | P-SI-52 | 136 |
| Arwa Meshal R. Alkathiri | P-MC-05 | 143 |
| Asma Al-Yafei | P-SI-30 | 114 |
| Asmaa.M.Fahim | P-SI-43 | 127 |
| Ayman A. Gouda | P-SI-32 | 116 |
| Aymen Abdulsattar Dagher | OL-10 | 61 |

| Name | Code | Page No. |
|------------------------|---------|----------|
| Baderul Khan | IL-4 | 42 |
| Basma Ghazal | P-MC-37 | 175 |
| Bedoor K. Alnasser | OL-1 | 51 |
| Ceren Pekcan | P-SI-47 | 131 |
| David Read | IL-3 | 41 |
| Dina ayed | P-MC-50 | 188 |
| Fadi Ibrahim | P-SI-23 | 107 |
| Fadi Ibrahim | P-SI-29 | 113 |
| Faleh K. F.Al-Shammari | P-CE-7 | 79 |
| Firas A. Albadran | P-SI-40 | 124 |
| Gowhar Ahmad Naikoo | OL-3 | 53 |
| Guray Kilincceker | P-SI-35 | 119 |
| Hadaf Dhafer Al-Yaseen | P-MC-45 | 183 |
| Haider A. J. Al Lawati | IL-5 | 43 |
| Haider A. J. Al Lawati | P-SI-53 | 137 |
| Halema Alkandari | OL-2 | 52 |
| Hamada M. Ibrahim | P-SI-26 | 110 |
| Hamama Boularaf Larkem | P-CE-9 | 81 |
| Hamdi Abderrezak | P-CE-8 | 80 |
| Hamidah Isamil Taqi | P-SI-54 | 138 |
| Hanadi Al-Sheeha | P-SI-11 | 95 |
| Husain Bahzad | OL-15 | 66 |
| Ideisan Abu-Abdoun | OL-17 | 68 |
| Ismail Warad | P-MC-39 | 177 |
| Jan Nisar | P-SI-51 | 135 |
| Jassim Al-Hassan | PL-4 | 34 |
| Jayaraju | P-MC-21 | 159 |
| Jothibasu Ramasamy | P-MC-08 | 146 |
| Jothibasu Ramasamy | OL-13 | 64 |
| Khalid Al-Otaibi | P-SI-13 | 97 |
| Khalidah Al-Dalama | P-SI-09 | 93 |
| Khalidah Salih Merzah | P-MC-38 | 176 |
| Khalifa Bouresli | P-CE-3 | 75 |
| Laila Alhadad | P-MC-35 | 173 |
| Latifa Alostad | P-SI-16 | 100 |
| M. Breida | P-SI-45 | 129 |
| Mahmoud A. Mohsin | P-MC-48 | 186 |
| Mahmoud Soliman | P-SI-24 | 108 |
| Mahmoud Fathy | P-SI-41 | 125 |
| Majed S Alokail | OL-9 | 60 |

| Name | Code | Page No. |
|-------------------------------|---------|----------|
| Maliheh Salimi | OL-18 | 69 |
| Mama El Razi | OL-4 | 54 |
| Manee AlManea | OL-6 | 56 |
| Mat Uzir Wahit | IL-6 | 44 |
| Maysoon Alhafez | P-MC-47 | 185 |
| Meshari Almutairi | P-CE-5 | 77 |
| Metwally Madkour | P-MC-14 | 152 |
| Miguel A. Bañares | PL-6 | 36 |
| Mohamed Abd El-Gawad Zayed | IL-1 | 39 |
| Mohamed O. Amin | P-SI-50 | 134 |
| Mohammad Ejaz | P-CE-2 | 74 |
| Mohammad R. Alenezi | P-MC-10 | 148 |
| Mohammed Alansari | P-CE-1 | 73 |
| Mohammed Ejaz | P-MC-29 | 167 |
| Mohammed Turki | P-MC-19 | 157 |
| Mostafa Aly Hussien Abd El Al | P-MC-53 | 191 |
| Moudi Fakhri Al-Mutairi | OL-8 | 59 |
| Mozhdeh Seyyedhamzeh | P-MC-15 | 153 |
| Mozhdeh Seyyedhamzeh | P-MC-16 | 154 |
| Muhammad Zahid Qureshi | OL-5 | 55 |
| Muhammad Zahid Qureshi | P-SI-33 | 117 |
| Mukhtar ul Hassan | P-MC-20 | 158 |
| Mustafa Kemal Sangün | OL-16 | 67 |
| Mustafa Kemal Sangün | P-SI-34 | 118 |
| Mustafa Kemal Sangün | P-SI-36 | 120 |
| Mustafa Kemal Sangün | P-SI-37 | 121 |
| Mustafa Kemal Sangün | P-SI-38 | 122 |
| Naemah Mansour Al-Mansour | P-MC-54 | 192 |
| Najlaa Saad Oudah Alradadi | P-MC-06 | 144 |
| Najlaa Saad Oudah Alradadi | P-MC-26 | 164 |
| Naseem Ahmed | P-MC-43 | 181 |
| Nathera Abass Ali Al Tememee | P-MC-23 | 161 |
| Nazim Hasan | P-MC-17 | 155 |
| Noha S. Mostafa | P-SI-27 | 111 |
| Norbert J. Pienta | PL-2 | 32 |
| Nouf Alhamdan | OL-7 | 57 |
| Nouria Al-Awadi | OS-1 | 27 |
| Nuha Obaid Juma Alsoom | P-MC-49 | 187 |
| Ohoud Al-Qurashi | P-SI-01 | 85 |
| Omar El Seoud | PL-3 | 33 |
| Omnia Hassan Abdelraheem | OL-11 | 62 |

| Name | Code | Page No. |
|-------------------------|---------|----------|
| Osama M. Ali Habib | P-SI-25 | 109 |
| Osamah K. Alshurafa | P-SI-20 | 104 |
| Peter Q Tranchida | PL-5 | 35 |
| Rabeea M. Ali Daoub | P-SI-39 | 123 |
| Rashed Bouresli | P-SI-08 | 92 |
| Rehab Masmoudi | P-MC-11 | 149 |
| Saad Makhseed | IL-2 | 40 |
| Salah Al-Enezi | P-SI-18 | 102 |
| Saleh Ali Mahmood | P-MC-40 | 178 |
| Salem Ahmed Hzzazi | P-CE-12 | 84 |
| Salim Ok | P-SI-15 | 99 |
| Salman A. Al-Qabandi | P-SI-12 | 96 |
| Sayed Kenawy H. Ibrahim | P-MC-01 | 139 |
| Sayed Mansour A.Abdalla | P-MC-02 | 140 |
| Seifollah Jalili | P-MC-18 | 156 |
| Shady M. eldafrawy | P-SI-46 | 130 |
| Shaif M. Kasem Saleh | P-MC-30 | 168 |
| Shamsun Nahar | P-MC-13 | 151 |
| Shekhah Al-Kandari | P-MC-12 | 150 |
| Sherif Elsaied Ebied | P-MC-22 | 160 |
| Shroog A. Alansari | P-SI-21 | 105 |
| Siham Al-Qaradawi | P-SI-05 | 89 |
| Sihamalshemry | P-MC-52 | 190 |
| Sulaiman M Alfadul | P-MC-03 | 141 |
| Taghreed Hashim Al-Noor | P-MC-44 | 182 |
| Tahani AlShammari | P-SI-07 | 91 |
| Talat Saeed | IL-10 | 48 |
| Tarek ELGogary | P-SI-22 | 106 |
| Tariq Aqeel | P-MC-09 | 147 |
| Tariq Mahmud | P-MC-51 | 189 |
| Thangavaloo C.Naick | P-SI-31 | 115 |
| Yasir Ali Arfat | P-MC-28 | 166 |
| Y. M. Ibrahim Issa | OL-12 | 63 |
| Zahra A. Alsaihati | P-MC-32 | 170 |
| Zeid A Alothman | P-MC-25 | 163 |

Kuwait Conference of Chemistry - 2018



List of Presentations

OPENING LECTURE

| | |
|--|----|
| OS-1: Driving Forward the Higher Education Reform: The Vital Role of the National Bureau for Academic Accreditation and Education Quality Assurance (NBAQ), <i>Nouria Al-Awadi</i> | 13 |
|--|----|

PLENARY LECTURE.....15

| | |
|--|----|
| PL-1: Advances in Characterization, Production and Applications of Diamondoid Molecules, <i>G.AliMansoori</i> | 17 |
|--|----|

| | |
|--|----|
| PL-2: Using Evidence-Based Research to Inform Teaching: Studying Student Problem-Solving Using Technology and Eye Tracking, <i>N. J. Pienta</i> | 18 |
|--|----|

| | |
|---|----|
| PL-3: Education for Sustainable Development for Undergraduate and High-School Students: Learning Theory from Experimental, <i>Omar A. El Seoud</i> | 19 |
|---|----|

| | |
|--|----|
| PL-4: Exciting Discoveries Utilizing Materials from the Skin of the Catfish <i>Arius Bilineatus</i> , Val. In The Novel Treatment of Diseases That Are Unresponsive To Conventional Treatment, <i>Jassim M. Al-Hassan</i> | 20 |
|--|----|

| | |
|---|----|
| PL-5: An Innovational 5-Dimensional System (Lc-Gc×Gc-Ms/Ms) for the Analysis of Petroleum Derivatives, <i>P.Q. Tranchida</i> | 21 |
|---|----|

| | |
|---|----|
| PL-6: Spectroscopy during Catalysis: The Operando Methodology to Understand Structure Activity Relationships, <i>M. A. Bañares</i> | 22 |
|---|----|

INVITED LECTURE23

| | |
|---|----|
| IL-1: Preparation and Characterization of Novel Magnetic ZnFe ₂ O ₄ –Hydroxyapatite Core–Shell Nanocomposite and Its Use as Fixed Bed Column System for Removal of Oil Residue In Oily Wastewater Samples, <i>Mohamed Abd El-Gawad Zayed</i> | 25 |
|---|----|

| | |
|---|----|
| IL-2: Highest Singlet Oxygen Generator Based On Phthalocyanines in Aqueous Media, <i>Saad Makhseed</i> | 26 |
|---|----|

| | |
|---|----|
| IL-3: Chemistry Education in the 21st Century: Meeting the Challenges, <i>David Read</i> | 27 |
|---|----|

| | |
|--|----|
| IL-4: Meaningful Integration of Learning Technologies in Chemistry, <i>Baderul Khan</i> | 28 |
|--|----|

| | |
|---|----|
| IL-5: “Lab On A Paper” A Promising Approaches For Teaching Chemistry In Schools, <i>Haider A. J. Al Lawati</i> | 29 |
|---|----|

| | |
|---|--|
| IL-6: Bionanocomposite Regenerated Cellulose Films Using Ionic Liquid Solvent, | |
|---|--|

| | |
|--|----|
| <i>Mat Uzir Wahit</i> | 30 |
| IL-7: Lab-On-A-Chip Technology for Chemical & Biomedical Analyses: Fundamentals, Recent Progress, and Future Perspectives, <i>Abdulilah Dawoud Bani-Yaseen</i> | 31 |
| IL-8: Plant Extract Mediated Eco-Friendly Synthesis of Pd@Graphene Nanocatalyst: An Efficient and Reusable Catalyst for the Suzuki-Miyaura Coupling, <i>Abdulrahman Al-Warthan</i> | 32 |
| IL-9: Smart Materials for Energy Saving, <i>Afshin Hadipour</i> | 33 |
| IL-10: Plastics and Microplastics in Coastal Areas of Kuwait: An Emerging Pollutant, <i>Talat Saeed</i> | 34 |
| ORAL LECTURE | 35 |
| OL-1: The Effect of Different Beverages on the Surface Structures of Orthodontic Nano-Hybrid Composites, <i>Bedoor Alnaser and Abdulsalam Alhazza</i> | 37 |
| OL-2: Titanium Nanocomposites Based Catalysts in Wastewater Treatment, <i>Halema Al-Kandari</i> | 38 |
| OL-3: Fabrication of Highly Efficient Non-Enzymatic Glucose Sensor Composed Of Nio@Sinps Composite Materials, <i>Gowhar Ahmad Naikoo</i> | 39 |
| OL-4: Determination of Carbaryl at Modified Carbon Paste Electrode by Low Silica X Zeolite or Polymeric Film, <i>M. El Rhazi</i> | 40 |
| OL-5: Green Synthesis of Iron Oxide Nanoparticles Using Orange Peels Extract And Their Application as A Tool for Drug Delivery, <i>Muhammad Zahid Qureshi</i> | 41 |
| OL-6: To What Extent Do Science Teachers Fulfil Teaching Competency from the Point of View of the Head Of Science Department In Middle Schools In The State Of Kuwait, <i>Manee AlManea</i> | 42 |
| OL-7: Chemistry: From The Past To The Future, <i>N. Al-Hamdan</i> | 43 |
| 44 AL-1: Arabic Lecture: تطبيقات الواقع المزز في تعليم وتعلم المواد العلمية (Augmented Reality Applications in Teaching and Learning Sciences), <i>Dr Abdullah AlFalikawi</i> , | |
| OL-8: Robotic Chemistry, <i>Moudi Fakhri Al-Mutairi</i> | 45 |
| OL-9: Roteomics Analysis Tools to Study Vitamin D Correlation with Expression of Sex-Specific IGFBP-2 AND IGFBP-3 in Type-2 Diabetes Risk, <i>Majed S. Alokail</i> | 46 |
| OL-10: New Modified Method for Determination of Nitric Oxide Synthase Activity in Plasma of Vitiligo Patients, <i>Aymen Abdulsattar Dagher</i> | 47 |
| OL-11: Microwave Preparation of a Novel Chitosan/Actf Composite for the Removal of Ca+2 and Ba+2from Underground Water: Adsorption Modeling and Optimization, <i>Omnia Hassan Abdelraheem</i> | 48 |

| | |
|---|----|
| OL-12: Effect of Different Graphite Grades On the Response Characteristics of Clomipramine Hydrochloride Sensors and Its Determination In Bulk, Pharmaceutical Formulations and Biological Fluids, <i>Yousry M. Issa</i> | 49 |
| OL-13: Chemical Modification of Waste Vegetable Oil for Oil and Gas Drilling Industry Applications, <i>Jothibasuramasamy</i> | 50 |
| OL-14: Degradation of Prothionamide in Subcritical Water Medium: Application of Box-Behnken Design, <i>A.M. Gizir</i> | 51 |
| OL-15: Techno-Economical Assessment for a Novel H ₂ Production Process via Chemical Looping Technology, <i>H. Bahzad</i> | 52 |
| OL-16: Investigation of Hydrogen Production by Using Silver Coated Platinum Electrode in Phosphate Solutions, <i>Mustafa Kemal Sangün</i> | 53 |
| OL-17: Applications of Neem Tree Products to Green Concepts, <i>Ideisan I. Abu-Abdoun</i> | 54 |
| OL-18: Sludge Production in Chemical Precipitation, <i>M.Salimi</i> | 55 |
| POSTER PRESENTATIONS | 57 |
| P-CE-01: Challenges and Suggested Solutions in Chemistry Education in the Health Sciences Center, <i>M. Alansari</i> | 59 |
| P-CE-02: Determination of Fluoride Levels in Soft Drinks, Fruit Juices and Milk Consumed By the Population in Kuwait Using an Ion-Selective Electrode, <i>M.E. Bhatti</i> | 60 |
| P-CE-03: Implement Operating Procedure for Dynamic Blocking Tube Rig for Scaling Studies, <i>K. Bouresli</i> | 61 |
| P-CE-04: Substitute CRMs for Quality Control Purposes with In-House QCM <i>Abdullah Essa Al-Qamous</i> | 62 |
| P-CE-05: Correlation of the Chemical Oxygen Demand of High Salinity Water Using Hg And Hg-Free Cod Vials and the Effect of Chloride Ion, <i>Meshari Saad Almutairi</i> | 63 |
| P-CE-06: Deploying A New Management Performance Features In Kuwait Oil Company's Operational Laboratories Using Laboratory Information Management System Software, <i>Ahmed Abdulnabi Al-Hashemi</i> | 64 |
| P-CE-07: Black Powder in Gas Lines at NK Area, <i>Faleh Al-Shammari</i> | 65 |
| P-CE-08: Chromatographic Separation of Some Antiepileptic Drugs, <i>A.Hamdi</i> ... | 66 |
| P-CE-09: A Novel Research Synthesis of Pharmaceutical Products via Catenenes, <i>H.Larkem</i> | 67 |
| P-CE-10: Synthesis Of 1,10-Dichlorobenzo[C] Cinnoline, And Its N-Oxide With Some Strained Molecules Related To Biphenylene, <i>A.Larkem</i> | 68 |

| | |
|---|----|
| P-CE-11: Synthesis, Characterization and Emission Spectra of Some Schiff Bases and Their Ternary Complexes with Rare Earth Metal Ions, <i>A. L. El-Ansary</i> | 69 |
| P-CE-12: Improvement in Salt Content Standard Preparation, <i>Salem Ahmed Hzzazi</i> | 70 |
| P-SI-01: Computational Investigation on the Role of the Diphenylamino-Coumarin as Electron Donor for Organic Silyl-Anchor Dyes In DSSCs, <i>O. Al-urashi</i> | 71 |
| P-SI-02: Optimization of Water Desalination System Powered By High Concentrated Photovoltaic Panels in Kuwait Climate Conditions, <i>Adel A. Ghoneim</i> | 72 |
| P-SI-03: Highly Efficient Hole Transporting Materials Based On Zinc Phthalocyanines for Promising Use in Perovskite Solar Cells, <i>Ali A. Husain</i> | 73 |
| P-SI-04: Quest for Perovskite Solar Cells Application Based On Phthalocyanine, <i>Ahmed Abdel Nazeer</i> | 74 |
| P-SI-05: Structure Tailoring Of Ptpd Nanodendrites Sensitized Niobium Oxynitride for Photoelectrochemical Hydrogen Evolution, <i>Siham Y. AlQaradawi</i> | 75 |
| P-SI-06: Shape-Dependent Electrocatalytic Acitivity of Gold Nanoparticles towards the oxidation of Glucose, <i>A.S.AlJaber</i> | 76 |
| P-SI-07: Optimization Sample Preparation for Elemental Analysis, <i>Tahani Al-Shamary</i> | 77 |
| P-SI-08: Optimization of HPLC Technique for the Identification of Aromatic Groups in Kuwait Middle Distillates, <i>Rashed Bouresli</i> | 78 |
| P-SI-09: Recycling Of Waste Alumina and Catalyst Fines Produced In the Catalyst Manufacturing Unit, <i>K. Al-Dalama</i> | 79 |
| P-SI-10: Hydroisomerization/Hydrocracking of N-Hexane and N-Heptane on the Bifunctional Sites Generated In-Situ on the WO ₃ /TiO ₂ Surface, <i>A. M. Mohamed.</i> .. | 80 |
| P-SI-11: Determination of Acid Sites of Dealuminated Zeolite by Using Isopropanol as Probe Molecule, <i>H. Al-Sheeha</i> | 81 |
| P-SI-12: Reducing Safety Risk by Elimination Bacteria Issue in Oil Production Facilities, <i>Salman Ahmad Al-Qabandi</i> | 82 |
| P-SI-13: Low Dosage Hydrate Inhibitor Implementation in North Kuwait Jurassic Fields <i>Khalid Al-Otaibi</i> | 83 |
| P-SI-14: Study the Effect of Acceleration Boiling Degree on the Quality of Engine Fuels, <i>Ali A. Ali Al yasiri</i> | 84 |
| P-SI-15: Molecular Structural Determination of Heavy and Light Crude Oil Asphaltenes by Infrared, Raman, Two-Dimensional NMR Spectroscopy, and Molecular Dynamics Simulations, <i>Salim Ok</i> | 85 |

| | |
|---|-----|
| P-SI-16: Group Type Analysis of Vacuum Residue Using Tlc-Fid and Open Column Chromatography. <i>Latifa Al-Ostad</i> | 86 |
| P-SI-17: Dilution Effect of Heavier Atmospheric Residues on Their Hydroprocessing <i>Ahmad Al-Otaibi</i> | 87 |
| P-SI-18: Poly (Vinylidene Fluoride) Based Porous Membranes Containing Ionic Liquid, <i>S. Al-Enezi</i> | 88 |
| P-SI-19: Synthesis and Antimicrobial Evaluation of New Thiazole Nucleosides under Green Chemistry, <i>Amira A. Ghoneim</i> | 89 |
| P-SI-20: Evaluation of New Biocide Determination Methods at Sea Water Treatment Plant, <i>Osamah K. Alshurafa</i> | 90 |
| P-SI-21: Determination the Accumulation of Trace Element in the Soil, Water and Plants in Farm from Jeddah City, <i>Shroog A. Al-Ansari</i> | 91 |
| P-SI-22: Atmospheric Oxidation of Methyl Propanoate by the Oh Radical, <i>Tarek M. El Gogary</i> | 92 |
| P-SI-23: Smart Green Chemistry Synthesis of Microporous Material by Flow Injection Method for CO2 Capture, <i>Fadi Ibrahim</i> | 93 |
| P-SI-24: Removal of Bismuth (III) and Manganese (II) From Aqueous Samples Using Chemically Modified Walnut Shell Biomass: Equilibrium, Kinetic and Thermodynamic Study, <i>Mahmoud Soliman</i> | 94 |
| P-SI-25: Pyrolysis of 1-Alkylazetidione Derivatives: A Versatile Route toward Electron-Rich Alkenes, C-1 Allylation and/or Homologation of Aldehydes, <i>Osama M. Habiba</i> | 95 |
| P-SI-26: A Sustainable Efficient Ultrasonic-Mediated One-Pot Synthesis Of 2,3,6,7,9-Pentaazabicyclo[3.3.1]Nonanes Via A N,N-Dimethylformamide Dimethylacetal Catalyzed Mannich-Like Reaction, <i>Hamada Mohamed Ibrahim</i> | 96 |
| P-SI-27: Regio- And Stereoselective Route To Bis- [3-Methyl-1,1',4'-Triaryl-5-Oxo-Spiro-Pyrazoline-4,5'-Pyrazoline] Derivatives Via 1,3-Dipolar Cycloaddition Under Sonication as Novel Antimicrobial Agents, <i>Noha S. Mostafa</i> | 97 |
| P-SI-28: Identifying the Development of Plastic Film Product Originated From Solid Waste Using SEM, <i>A.Alhazza</i> | 98 |
| P-SI-29: Green Synthesis of Zinc-Nanoparticles Using Capillary-Furnace Led Based Reactor from Portulaca Oleracea Leaf and Its Applications in Antimicrobial Activity, <i>Fadi Ibrahim</i> | 99 |
| P-SI-30: Application of Date Pits as Green Adsorbents for Removal of Heavy Metals: A Factorial Design Approach, <i>A. Al-Yafei</i> | 100 |
| P-SI-31: Strategies to Integrate Education for Sustainable Living in the Arts and Culture Learning Area, <i>T.C Naick</i> | 101 |

| | |
|---|---------|
| P-SI-32: A New Green Supramolecular Solvent-Based Liquid–Liquid Micro-extraction Method for Aluminum Determination in Real Water, Hair and Biological Samples Collected From Saudi Arabia, <i>Ayman A. Gouda</i> | 102 |
| P-SI-33: Synthesis and Application of Carbon Nanoparticles from Agricultural Waste and Their Characterization, <i>Muhammad Zahid Qureshi</i> | 103 |
| P-SI-34: The Inhibition Effects of Variamine Blue on Corrosion Behaviour of Copper in Chloride Solution, <i>M. Kemal Sangün</i> | 104 |
| P-SI-35: The Effects of Sodium Nitrite on Corrosion Resistance of Steel Reinforcement in Concrete, <i>Güray Kılınççeker</i> | 105 |
| P-SI-36: Poly(2-Chloroaniline) And Poly(Aniline-Co-2-Chloroaniline) Films On Znfe Alloy Plating, <i>M. Kemal Sangün</i> | 106 |
| P-SI-37: Determination of Pani Ppy and Pani Films Effect on Corrosion Behavior of ZnNi Coated Carbon Steel, <i>M. Kemal Sangün</i> | 107 |
| P-SI-38: Glucose Biosensor Construction by Entrapment of Glucose Oxidase in Polyrhodanine Synthesized On Carbon Paste Electrode, <i>M. Kemal Sangün</i> | 108 |
| P-SI-39: Rheology and Stability of Emulsions of Some Acacia Gums, <i>Rabeya Daoub</i> | 109 |
| P-SI-40: Platinum Catalyst: A Novel Tool for Green Flow Chemistry Approach in Pharmaceutical Industry. <i>Firas A. H. Albadran</i> | 110 |
| P-SI-41: Hardness and Iron Adsorption onto Natural Clay Minerals: Kaolinite/Smectite Composite, <i>Mahmoud Fathy</i> | 111 |
| P-SI-42: Oil Pollution of Water from Refining Units of Baiji Refineries, <i>Abid Ahmad Erdeni</i> | 112 |
| P-SI-43: Regioselective Synthesis and Ab Initio Calculations of (E)-4-(2-Cyano-3-(Dimethylamino) Acryloyl) Benzoic Acid from Poly (Ethylene Terephthalate) Waste and Its New Molecular Imprinted Polymer, <i>Asmaa.M.Fahim</i> | 113 |
| P-SI-44: Effect of Organic Ligands on the Sorption of Radiocobalt on Soil and Clay, <i>A.A. Helal</i> | 114 |
| P-SI-45: Removal of Heavy Metals by Tight Ultrafiltration Membrane at Low Pressure <i>M. Breida</i> | 115 |
| P-SI-46: Removal of Organic and Inorganic Pollutant by Modified Nano ZnO, <i>Shady Mohamed El-Dafrawy</i> | 116 |
| P-SI-47: Investigation Of Degradation of 2-Chlorophenol And 2,4-Dichlorophenol Compounds In Wastewater by Ultrasonic Method, <i>C.Pekcana</i> | 117 |
| P-SI-48: The Orchestra of Phytoextraction: Can Metabolite Circulation Indicate the Efficiency of Brassica To Tolerate Metal Toxicity?, <i>A. A. Al-Qatan</i> | 228 118 |

| | |
|--|-----|
| P-SI-49: Removal of Heavy Metals by Tight Ultrafiltration Membrane at Low Pressure, <i>S. Alami Younssi</i> | 119 |
| P-SI-50: Metal Oxide Nanoparticles for Latent Fingerprint Visualization and Analysis of Small Drug Molecules Using Surface Assisted Laser Desorption/Ionization Mass Spectrometry, <i>Mohamed O. Amin</i> | 120 |
| P-SI-51: Basic Requirements of a Kinetics Study, <i>Jan Nisar</i> | 121 |
| P-SI-52: Advanced Forensic Analytical Tools for the Determination Blood Alcohol Content, <i>A. Alshammri</i> | 122 |
| P-SI-53: Novel Microfluidics and Nano-droplets microfluidic methods for the determination of total phenolic content in food samples using chemiluminescence detection techniques. <i>Haider A. J. Al Lawati</i> | 123 |
| P-SI-54: Analytical Facilities Developed By KISR to Support the Activities of the Stockholm Convention Regional Center for West Asia, <i>Hamidah Taqi</i> | 124 |
| P-MC-01: Multi-Therapeutic Cost Effective Bio-Ceramic Nanoparticles Containing Transition Metals for Biomedical Applications, <i>Sayed H. Kenawy</i> | 125 |
| P-MC-02: The Evaluation CaCo ₃ /Polymer Nanocomposites Performance for Consolidation and Preservation of Lime Stone Monuments, <i>Sayed M. Ahmed</i> | 126 |
| P-MC-03: Manufacture Nanomagneting Filter, <i>Sulaiman M. Alfadul</i> | 127 |
| P-MC-04: Manufacturing Of Polymer Nano-Composites Using Vacuum Infusion Process, <i>Abdulaziz N. Alyoubi</i> | 128 |
| P-MC-05: Development of Silica Nanoparticles Catalyst for Esterification Reactions, <i>A. Alkathiri</i> | 129 |
| P-MC-06: Green Synthesis of Platinum Nanoparticles Using Saudi's Dates Extract and Their Usage on the Cancer Cell Treatment, <i>Najlaa S. Al-Radadi</i> | 130 |
| P-MC-07: An Eco-Friendly Synthesis of Silver and Gold Nanoparticles with Barni Fruit and Their Applications on the Cancer Cell Treatments, <i>Najlaa S. Al-radadi</i> ... | 131 |
| P-MC-08: Potential Applications of Nanotechnology for Oil and Gas Field Drilling Applications, <i>Jothibas Ramasamy</i> | 132 |
| P-MC-09: Mesoporous Silica Prepared By Modified True Liquid Crystal Templating Method with High Thermal Stability and 10-Year Shelf Life, <i>Tariq Aqeel</i> | 133 |
| P-MC-10: Morphology Control of Metal Oxide Nanostructures, <i>Mohammad R. Alenezi</i> | 134 |
| P-MC-11: Physical and Mechanical Characterization of Cement Paste Blended With Natural Volcanic Ash, Metakaolin, and Nano-Silica/Alumina Mixtures, <i>Rehab Masmoudi</i> | 135 |

| | |
|--|-----|
| P-MC-12: Removal of Phenols from Wastewater Using 2D/3D Photocatalyst, <i>S. Al-Kandari</i> | 136 |
| P-MC-13: Alox Nano-Clusters Synthesized Via Bonded- And Unbonded-Aramid-Alox Composite Films for Removal of Organic Dye Waste, <i>Shamsun Nahar</i> | 137 |
| P-MC-14: Nanophotocatalysts with Efficient Full Solar Energy Harvesting Via n-p Direct and Indirect Nanoheterostructures, <i>Metwally Madkour</i> | 138 |
| P-MC-15: Hydrophobic Cellulose Aerogel Modified With Nano-TiO ₂ ; Synthesis, Characterization, and Catalytic Application, <i>Mozhdeh Seyyedhamzeh</i> | 139 |
| P-MC-16: Synthesis, Characterization, and Catalytic Application of Microcrystalline Cellulose Modified With Metallophthalocyanines, <i>Mozhdeh Seyyedhamzeh</i> | 140 |
| P-MC-17: Biosynthesis of Iron Nanoparticles Using Plant Extracts for Photocatalytic Methyl Orange Dye Degradation and Antibacterial Applications, <i>N. Hassan</i> | 141 |
| P-MC-18: Water Transport and Desalination through Double-Layer Graphyne Membranes, <i>Seifollah Jalili</i> | 142 |
| P-MC-19: A Study of Some Trace Elements in Samples of Cutting Rocks and Crude Oil For Three Wells In Misan Oil Fields, <i>Mohammed Turki</i> | 143 |
| P-MC-20: Green Synthesis of Iron Nanoparticles (FeNPS) and Noval Applications, Their Role as Co-Factor in Poultry Feed, <i>Mukhtar ul Hassan</i> | 144 |
| P-MC-21: Bivalve Shell Chemistry as Proxies of Metal Pollution: A Case Study from Parts of South Andhra Coast, East Coast of India, <i>Jayaraju</i> | 145 |
| P-MC-22: Electro-Oxidation Mechanism and Sensitive Detection of Escitalopram Oxalate in Human Plasma Samples and Formulation Using Carbon Paste Electrode Modified With Natural Sodium Montmorillonite Clay, <i>Sherif E. Ebied</i> | 146 |
| P-MC-23: Solvent Effect On the Spectroscopic Properties of Some Laser Compounds and energy transfer Processes, <i>N. Abass Ali Al-Tememe</i> | 147 |
| P-MC-24: Development of a New Polypyrrole Ultrafiltration Membrane on Flat Pozzolan Support for Removal of Congo red From Aqueous Solutions, <i>Saad Alami Younssi</i> | 148 |
| P-MC-25: Schiff Base Ligand Incorporated Nanocomposite Sorbent For Optical Copper(II) Ions Removal From Aqueous Solutions, <i>Zeid A. Alothman</i> | 149 |
| P-MC-26: Environmentally-Safe Synthesis of Gold and Silver Nano-Particles with Al-Madinah Barni Fruit and Their Applications in the Cancer Cell Treatments, <i>Najlala S. Al-Radadi</i> | 150 |
| P-MC-27: Trends in Nanotechnology: State Of The Art, <i>Abdulwahab S Almusallam</i> | 151 |
| P-MC-28: Biodegradable Polylactide-Based Films Incorporated With Bimetallic Ag-Cu Nanoparticles and Essential Oil for Food Packaging Applications, | |

| | |
|---|-----|
| <i>Yasir Ali Arfat</i> | 152 |
| P-MC-29: Zinc Oxide Nanorods/Clove Essential Oil Incorporated Type B Gelatin Composite Films and Its Applicability for Shrimp Packaging, <i>Mohammed Ejaz</i> | 153 |
| P-MC-30: Biodegradation of Benzene by Alkaliphilic Bacteria under Aerobic Conditions, <i>Shaif M. Kasem Saleh</i> | 154 |
| P-MC-31: Synthesis of Some New Azo-Dye from Hydroxyquinolin-2(1h)-One Derivatives with Expected Antimicrobial Activity, <i>Amira A. Ghoneim</i> | 155 |
| P-MC-32: Experimental and Theoretical Investigations of the Molecular and Electronic Structure of Pyrane-Based Cemranoids of Marine Origin, <i>Zahra A. Alsaihatia</i> | 156 |
| P-MC-33: α -Amino acid Schiff base derived Ru/Pt complexes: Protein binding and Cytotoxicity, against HepG2 cell, <i>Ali Alsalmeh</i> | 157 |
| P-MC-34: Molecular and Immunological Characterization of Mycobacterium Tuberculosis-Specific Esat6-Like Genes and Proteins Using Polymerase Chain Reaction and Chemically Synthesized Peptides, <i>Abu Salim Mustafa</i> | 158 |
| P-MC-35: Invitro Evaluation of HSP27 Inhibitors Function through HER2 Pathway for Ovarian Cancer Therapy, <i>L. Alhadad</i> | 159 |
| P-MC-36: Pseudo-Spider Phthalocyanine (Pc) Molecules as Photosensitizer Building Blocks For Medicinal Applications, <i>Asaithampi Ganesan</i> | 160 |
| P-MC-37: Highest Singlet Oxygen Generator Based On Phthalocyanines in Aqueous Media, <i>Basma Ghazal</i> | 161 |
| P-MC-38: Targeting Inflammation with Polylactic Acid Nanoparticles Loaded with siRNA/Polyethylenimine, <i>K. Merzah</i> | 162 |
| P-MC-39: Synthesis and Xrd novel Of [Cu(Dien)(NN)]Br ₂ Complexes: Thermal, Solvatochromism, Electrochemistry, Hirshfeld Surface Analysis And Antibacterial Activity, <i>Ismail Warad</i> | 163 |
| P-MC-40: Genetic Association between Human DNA Double-Strand Break Repair Gene XRCC7 Polymorphism with Staging and Development of Bladder Cancer Among Iraqi Patients, <i>S.Mahmood</i> | 164 |
| P-MC-41: Water Soluble monocationic Cu(NO ₂ -phen) ₂ Br]Br complexes:Crystal structure, physicochemical, Hirschfeld surface, solvatochromism, computational and DNA-binding analysis, <i>Anas Al Ali</i> | 165 |
| P-MC-42: Facial Acne Therapy by Using Pumpkin Seed Oil with Its Physicochemical Properties, <i>Abeer A. Ibrahim</i> | 166 |
| P-MC-43: Cu(I)-Catalysed Isomerization Of Flavones To The Regioselective Trans-Aminated Aurones With Anilines Via Domino-Aza Michael Addition, Ring Opening and Cyclization Reactions under Basic Condition, <i>Naseem Ahmed</i> | 167 |
| P-MC-44: Synthesis, Characterization And Antimicrobial Activities Of [Co(II), Ni(II), Cu(II), Zn(II) And Cr(III)] Mixed Ligand Complexes Schiff Base Derived | 231 |


| | |
|---|-----|
| From Trimethoprim Antibiotic and Acetylacetone with Oxalic Acid <i>Taghreed Hashim Al-Noor</i> | 168 |
| P-MC-45: Interventional Biological Markers for Sarcopenia and Muscle Frailty in Iraqi Subjects, <i>Hadaf Al-Yaseen</i> | 169 |
| P-MC-46: Megamox Mediates Selenium Nanoparticles Synthesis for Developing Immunomodulatory, Antioxidant and Antimicrobial Activities against Multi-drug resistant Bacteria and Mycobacterium tuberculosis, <i>Ahmed A. Askar</i> | 170 |
| P-MC-47: A Comparison of Different Preparation Conditions on Polyphenols in Tea Infusions, <i>M. Alhafez</i> | 171 |
| P-MC-48: Biocompatibility of Polyurethanes for Medical Applications, <i>Mahmoud A. Mohsin</i> | 172 |
| P-MC-49: Replacement of the Ozone Depletor Tetrachloromethane with Bromotrachloromethane in Appel Type Reactions – Facile Amidation, Esterification, Anhydride Formation and Preparation of Nitriles, <i>N. Al Soom</i> | 173 |
| P-MC-50: Correlation between Fetuin A Level and Glycosylated Haemoglobin in Patients with Myocardial Infarction, <i>Dina Ayed Mohammed</i> | 174 |
| P-MC-51: Synthesis of anti-alpha glucosidase and anti-acetylcholinesterase active copper complexes of novel Schiff bases derived from N-[4-(hydrazinecarbonyl)phenyl]-2-[(5-phenyl-1,3,4-oxadiazol-2-yl) sulfanyl]acetamide, <i>Tariq Mahmud</i> | 175 |
| P-MC-52: Molecular Basis of Vitamin D3 Receptor Gene Polymorphism (RS 2228570) as Predictor For Coronary Artery Diseases, <i>Siham Abdul Zahra</i> | 176 |
| P-MC-53: Synthesis, Characterization, Molecular Docking and Anti-Tumor Activities of Some Transition Metal (II) Complexes with Semicarbazone, <i>M.A. Hussien</i> | 177 |
| P-MC-54: LC-MS in Traditional Herbal Medicine: The Antioxidant Potential in <i>Salvia Officinalis</i> L. Is Related To Rosmarinic Acid and Lower Malondialdehyde-Thiobarbituric Acid, <i>N. M. Al-Mansour</i> | 178 |

Kuwait Conference of Chemistry – 2018




Exhibitors


KUWAIT PETROLEUM CORPORATION

| | | |
|---|--|---|
|  | Exhibitor Name | Kuwait Petroleum Corporation |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | Shuwaikh Oil Complex 1858585/23813026 23813594 <u>hsaab@kpc.com.kw</u> <u>kpc.com.kw</u> |
| Company Profile | <p>Kuwait Petroleum Corporation is Kuwait's national Oil and Gas company with international presence. A performance-based company entrusted to optimize the value of Kuwait's hydrocarbon resources through effective integrated value chain activities. And seeks to care for the interest of stakeholders and the environment of the communities where it operates.</p> <p>Our vision is to reach a leading global position in the oil and gas field through:</p> <ul style="list-style-type: none"> • Being a secure and reliable supplier of hydrocarbons • Managing our operations with world-class HSSE standards • Being highly profitable and performance-driven enterprise • Being an actively integrated organization with corporate thinking approach. • Being an employer of choice • Being a positive role model for Kuwait Society | |

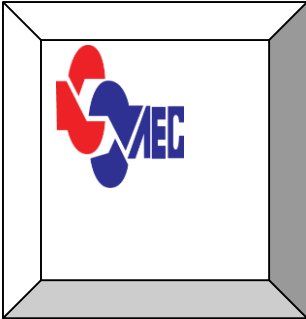
ADVANCED TECHNOLOGY COMPANY

| | | |
|--|---|---|
|  Advanced Technology Company K.S.C.P. شركة التقدم التكنولوجي ش.م.ك.ع. | Exhibitor Name | Advanced Technology Company |
| | Business Areas | Healthcare Industry <ul style="list-style-type: none"> ▪ Laboratory ▪ Medical & Surgical OR Solutions ▪ Lifecare, ICU, & Health facility infrastructure ▪ Pharmacy ▪ Infection control, Oral health, patient care & rehabilitation ▪ Kitchen & Laundry ▪ Security & Audio Visual ▪ Information Technology ▪ Healthcare, Manpower Services ▪ Admission ▪ Emergency Department ▪ Radiology Petroleum Industry Research & Education |
| | Contacts | <ul style="list-style-type: none"> ▪ ATC Tower, Salmiya, Salem Al Mubarak St, Block 4, Street 1 opposite Layla Tower, P.O.Box: 44558 Hawali 32060, Kuwait ▪ Tel: (+965) 222 47 444 ▪ Tel: (+965) 1885599 ▪ Fax: (+965) 25711761/2 ▪ (ATC Lab contact ID) ▪ www.atc.com.kw |
| Company Profile | ATC started operations in 1981 as a medical equipment supplier to the Kuwait healthcare sector. Today, ATC has established itself as the leading end-to-end total healthcare solutions provider capable of delivering over 95% of a hospital's requirement. | |
| Products and Services | <p>Bruker Daltonik. HPLC, LCMSMS triple Quad, LCMSMS QTOF, Maldi TOF, Maldi TOF TOF and GCMSMS TQ.</p> <p>Analytik Jena. Atomic Absorption, ICPMS, ICP-OES, TOC, CNS</p> <p>Scion Instruments. GC, GC analyzers and GC SQ MS</p> <p>GE Inspection Technologies. CT Imaging Machines</p> <p>Leica Microsystems. All type of microscopes for Research and Education</p> <p>Kewaunee Lab Furniture. Complete furniture solution for any kind of lab</p> <p>Envirotek Solutions. Shredding and decontamination solution for laboratory waste.</p> | |

Al Essa Medical & Scientific Equipment Co. W.L.L.

| | | |
|--|---|--|
|  <p>Al-Essa Group</p> | Exhibitor Name | Al Essa Medical & Scientific Equipment Co. W.L.L. |
| | Business Areas | Government & Private Sector |
| | Contacts | <ul style="list-style-type: none"> ▪ Address Sector C, Block 116, Street 38, 13036, Shuwaikh Industrial Area, Kuwait ▪ Phone 24834510 ▪ Fax 24840629 ▪ Email happays@alessakuwait.com ▪ Web www.alessakuwait.com ▪ Page |
| Products and Services | Medical Technology Scientific Technology Education Technology Information Technology & Engineering | |
| Authorized Agent for : | <ul style="list-style-type: none"> • Petroleum Analyzer Company, USA (PAC) • Mettler-Toledo International, Inc. Switzerland • LECO Corporation, USA • Skalar Analytical B.V, The Netherlands • Polyscience, USA • Quantachrome Instruments, USA • Milestone SRL, Italy | |


























AL ARFAJ ENGINEERING CO. W.L.L

| | | |
|---|---|--|
|  | Exhibitor Name | AL ARFAJ ENGINEERING CO. W.L.L |
| | Business Areas | Al Arfaj Engineering Company WLL offers innovative products & services in the field of engineering, Oil & Gas, Environment & Pollution Monitoring, Laboratory & Analytical Equipment , Educational Equipment, GIS & Security Solutions |
| | Contacts | <ul style="list-style-type: none"> ▪ Address Plot -47, Shuwaikh Industrial Area No. 2, Salmiya 22004 P.O Box No: 391, Kuwait ▪ Phone (965) 2481-7448/2481-7449 ▪ Fax (+965) 2481-7442 /3 ▪ Email info@arfajengg.com ▪ Web http://www.arfajengg.com/ |
| Products and Services | We offer complete solutions for Supply, Installation & Training on analytical, scientific, educational & environmental lab instruments for research & educational institutes, hydrocarbon process industries, and all regulatory authorities in Kuwait in partnership with well-known international brands. | |
| Presentation or Poster | <p>Presenter : Mr. Lijeesh Parayath, Application Specialist</p> <p>Presentation Title :</p> <p>“The Analysis of PIONA Compounds in Gasoline by ASTM Method D8071”</p> | |
| Authorized Agent for : | <p>Agilent Technologies Vinci Technologies, France Setaram Instrumentation, France Elementar GmbH, Germany Rigaku, Japan</p> | |


ASHRAF & COMPANY LTD

| | | |
|---|--|--|
| <p><i>ashraf & co. ltd.</i></p>  <p>العبد الرزاق شركة أشرف وشركاه المحدودة</p> | Exhibitor Name | Ashraf & Company Ltd |
| | Business Areas | Scientific & Lab, Medical Systems, Information Technology, Imaging, Industrial etc |
| | Contacts | <ul style="list-style-type: none"> ▪ Address P.O BOX 3555, SAFAT, 13036, ▪ Phone KUWAIT 1805151 ▪ Fax 24344888 ▪ Email sel@ashraf.com ▪ Web http://ashrafkuwait.com/ashraf-scientific-labs-division/ ▪ Page |
| Company Profile | <p>Ashraf & Company Ltd is specialized in the supply and service of equipment and solutions in the fields of Scientific & Lab Equipment, Medical Systems, Information Technology, Photography & Imaging. The Company is acknowledged as the market leader in conventional and digital medical and dental diagnostic imaging equipment and supplies, color films, color paper, minilabs and information, document and work flow management systems.</p> | |
| Products and Services | <p>Shimadzu Analytical Instruments, Japan Jeol Instruments , Japan Restek – USA, Cox Analytical-USA, LabTech-South Korea, Logan- USA, Texol-India, Leica LNT – Germany, Asylum Research – USA, Industrial Laborum- Portugal, StarLIMS Abbott Informatics- USA</p> | |
| Authorized Agent for : | <p>Shimadzu Analytical Instruments, Japan, Jeol Instruments , Japan, Restek – USA, Cox Analytical-USA, LabTech-South Korea, Logan- USA, Texol-India, Leica LNT – Germany, Asylum Research – USA, Industrial Laborum- Portugal, StarLIMS Abbott Informatics- USA</p> | |


ASBAR GENERAL TRADING & CONTRACTING CO.

| | | | | | |
|---|---|---|--|---|---|
|  <small>ASBAR FOR GENERAL TRADING & CONTRACTING شركة ابيبار للتجارة العامة والمقاولات ذ.م.م</small> | Exhibitor Name | ASBAR GENERAL TRADING & CONTRACTING CO | | | |
| | Business Areas | Sales and Services for Analytical instruments, Medical, Security and Laboratory equipment. | | | |
| | Contacts | <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | Kuwait City – Al Qebalah – Block 10 – Abdullah Al Mubarak Street – Ali Tower – 9th floor, office 5. Telefax: +965 22425525 info@asbarkw.com www.asbarkw.com | | |
| Company Profile | <p>Asbar for General Trading & Contracting Company (W.L.L), a Kuwaiti family business founded in 2007 with the aim of providing technologies and services that offers solutions in four different fields, which are Aerospace/Military and Defense, Oil and Gas, Governmental, and Health sectors. Asbar believes that these areas are extremely significant in the Gulf Cooperation Council (GCC) countries.</p> | | | | |
| Products and Services | <p>We supply all the needs of laboratories technology for OIL & GAS, GOVERNMENTAL, HEALTH , EDUCATIONAL and MILITARY LABs.</p> | | | | |
| <p>Authorized Agent for :</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>Analytical <small>Oil in Water - Great Britain</small></p> <p>Metrology <small>Spain</small></p> <p>Furniture <small>Germany</small></p> <p>LAB Consultancy <small>Germany</small></p> </td> <td style="width: 33%; vertical-align: top;"> <p> <small>www.pac.com</small></p> <p> <small>www.stanhope-seta.co.uk</small></p> <p>SENSOFAR</p> <p></p> <p> <small>Lab Engineering Benelux</small></p> </td> <td style="width: 33%; vertical-align: top;"> <p> <small>www.ceia.net/</small> #1 Security Technology in world</p> <p> <small>www.keesingtechnologies.com</small></p> <p>REFRATECHNIK <small>Global Leader in Refractory</small> <small>https://www.refra.com</small> <small>Germany</small></p> <p> <small>RTU Systems - Wellhead Oil Sector</small> <small>http://www.ff-automation.com</small></p> <p> <small>Germany - Medical</small> <small>https://ritterimplants.com</small></p> </td> </tr> </table> | | | <p>Analytical <small>Oil in Water - Great Britain</small></p> <p>Metrology <small>Spain</small></p> <p>Furniture <small>Germany</small></p> <p>LAB Consultancy <small>Germany</small></p> | <p> <small>www.pac.com</small></p> <p> <small>www.stanhope-seta.co.uk</small></p> <p>SENSOFAR</p> <p></p> <p> <small>Lab Engineering Benelux</small></p> | <p> <small>www.ceia.net/</small> #1 Security Technology in world</p> <p> <small>www.keesingtechnologies.com</small></p> <p>REFRATECHNIK <small>Global Leader in Refractory</small> <small>https://www.refra.com</small> <small>Germany</small></p> <p> <small>RTU Systems - Wellhead Oil Sector</small> <small>http://www.ff-automation.com</small></p> <p> <small>Germany - Medical</small> <small>https://ritterimplants.com</small></p> |
| <p>Analytical <small>Oil in Water - Great Britain</small></p> <p>Metrology <small>Spain</small></p> <p>Furniture <small>Germany</small></p> <p>LAB Consultancy <small>Germany</small></p> | <p> <small>www.pac.com</small></p> <p> <small>www.stanhope-seta.co.uk</small></p> <p>SENSOFAR</p> <p></p> <p> <small>Lab Engineering Benelux</small></p> | <p> <small>www.ceia.net/</small> #1 Security Technology in world</p> <p> <small>www.keesingtechnologies.com</small></p> <p>REFRATECHNIK <small>Global Leader in Refractory</small> <small>https://www.refra.com</small> <small>Germany</small></p> <p> <small>RTU Systems - Wellhead Oil Sector</small> <small>http://www.ff-automation.com</small></p> <p> <small>Germany - Medical</small> <small>https://ritterimplants.com</small></p> | | | |


ENVIRONMENT PUBLIC AUTHORITY

| | | |
|---|---|---|
|  | Exhibitor Name | الهيئة العامة للبيئة |
| | Business Areas | الهيئة العامة للبيئة |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | الشؤون الصناعية - الدائري الرابع - بجانب وزارة العمل 22208310 info@epa.org.kw www.epa.org.kw |
| Company Profile | <p> أنشئت الهيئة العامة للبيئة ببناءً على القانون رقم 21 لسنة 1995 والمعدل تحت رقم 16 لسنة 1996 ، وانتقلت الهيئة العامة للبيئة إلى مبنائها الجديد المعد بعناية ليضم كافة الأقسام المتمثلة للهيئة العامة للبيئة ونشاطاتها المتعددة كما صمم هذا المبنى ليكون من المباني الذكية والصدقية للبيئة بالكامل. </p> <p> الهيئة العامة للبيئة هي هيئة عامة ذات شخصية اعتبارية ولها هوية ملقبة بـ "مبنى البيئة" ولها الولاية على شؤون البيئة في الكويت وتحت إشراف مجلس الوزراء ويترأسه وزير البيئة وتختص الهيئة بالقيام بكافة الأعمال والاهتمام بالبيئة الكويتية في: </p> <p> وضع وتنفيذ السياسات العامة للدولة في شأن حماية البيئة ووضع البروتوكولات وخطط العمل من أجل حماية البيئة وصون الموارد الطبيعية والاعتماد على وتنفيذ كافة الإجراءات المتخذة لتعزيز التنمية البشرية والبيئة والصحة العامة للإنسان والتوسع الزراعي والبيئي والبيئة الطبيعية بما يفتقر للمنطقة على صحة الإنسان. </p> <p> وسأتم جميع البرامج وبنية العمل وحماية البيئة والمحافظة على التوازن البيئي بصفة عامة. </p> | |


Public Authority for Applied Education and Training

| | | |
|---|--|--|
|  | Exhibitor Name | Public Authority for Applied Education and Training |
| | Business Areas | Teaching |
| | Contacts | Technological Complex in Shuwaikh 96602022 https://pay.paaet.edu.kw/Languages/Default.aspx |
| Company Profile | <p>PAAET has two main sectors: Applied Education and Research, and Applied Education and Training.</p> <p>Applied Education and Research includes five colleges:</p> <ul style="list-style-type: none"> College of Basic Education College of Business Studies College of Technological Studies College of Health Sciences College of Nursing <p>Applied Education and Training includes eight institutes:</p> <ul style="list-style-type: none"> The Higher Institute of Telecommunication and Navigation (formerly the Telecommunication and Navigation Institute) The Higher Institute of Energy (formerly Electricity and Water Institute) Nursing Institute Industrial Training Institute (Sabah Al-Salem & Shuwaikh) Constructional Training Institute Vocational Training Institute Training Institute for Tourism and Beauty Institute of Administrative Management | |

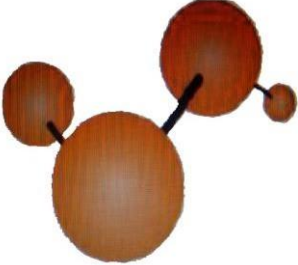
IBN RUSHD (AVERROES)

| | | |
|---|--|---|
|  | Exhibitor Name | IBN RUSHD (AVERROES) MEDICAL AND SCIENTIFIC CO.W. L.L |
| | Business Areas | ANALYTICAL, SCIENTIFIC, LABORATORY, DIAGONOSTIC AND MEDICAL |
| | Contacts | 2ND Floor, Muneera Complex, Salem Al Mubarak Street, Salmiya. Ph:25741049, Fax:25735301. Email:info@averroesco.com www.averroesco.com |
| Company Profile | <p>Ibn Rushd Medical & Scientific Equipment Co. is a professionally managed ISO 9001:2015 certified Kuwaiti owned Limited Liability Cooperating in Healthcare, Analytical & Environmental Science market segments. Ibn Rushd Co. was established in 1998 with the goal of being recognized as a professional company in Health Care, Analytical and Laboratory instrumentation in Kuwait. Averroes eagerly looks to compliment its current product line to cater the market requirements with added zeal and commitment. Averroes team continues the tradition by evolving the company's operation into an intelligent and knowledgeable entity in the Health Care, Analytical and Laboratory field. The company recognizes that its most important asset and success factor is its team. Our work force reflects diversity, knowledge and experience. With an Annual turnover of around 2.75 million Kuwaiti Dinar grades Averroes Co. is one of the fast-growing companies in Kuwait in the field of Health Care Business.</p> | |
| Products and Services | <p>LC MS, GC, GCMS, HPLC, ICP, AAS, ICPMS, RHEOMETER, DSC, DMA, TGA, IC, TITRATOR, POTENTIOSTAT, ONLINE ANALYZER, XRD, XRF, FT-IR</p> | |
| Authorized Agent for : | <p>Thermoscientific, Metrohm, TA instruments, Elga, Nikon, Syngene, Molecuar Devices etc..</p> | |


METAL RECYCLING COMPANY

| | | | | | | |
|--|---|--|--|---|--|--|
|  | Exhibitor Name | Metal Recycling Company. | | | | |
| | Business Areas | Waste Management – Recycling | | | | |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | <ul style="list-style-type: none"> ▪ Amghara Industrial Area, Next to Kuwait Municipality. ▪ +965 24577773/4/5 ▪ +965 24672168 ▪ mrcinfo@mrc.com.kw ▪ www.mrckw.com | | | | |
| <p>Company Profile</p> <ul style="list-style-type: none"> ▪ MRC is a leading eco-industrial company headquartered and listed in Kuwait. Environmentally and socially committed, MRC has been offering sustainable waste management, recycling and industrial solutions to government, oil and gas, petrochemicals, manufacturing and commercial clients since 1987. ▪ With more than two million square meters of industrial land within its eco-industrial parks in Kuwait, MRC builds partnerships and joint ventures with clients to support their needs in necessary industrial infrastructure and support services. Today, the Company continues to position itself as a key contributor to the strategic product and service offerings of a consistently growing sector. ▪ In its operations, MRC adopts the highest global standards of quality and environmental sustainability and is both ISO and OHSAS certified. Through its various subsidiaries, MRC offers extended capabilities in hazardous waste management, HVAC and facilities management services. ▪ Guided by the ‘New Kuwait Vision 2035’, MRC is spearheading the country’s eco-industrial evolution, working with various government bodies, research institutions, manufacturing and industrial heavyweights to develop Kuwait’s sustainable future and transform the industrial landscape through collaboration, synergy and partnerships. | | | | | | |
| <p>PRODUCTS</p> <table border="0"> <tr> <td> <p>Metals (raw materials)</p> <ul style="list-style-type: none"> •Shredded & Heavy melting steel •Shredded aluminum & stainless steel •Used pipes and plates & structural steel •Clean non-ferrous scraps </td> <td> <p>Plastics(raw materials)</p> <ul style="list-style-type: none"> •Polypropylene (PP) granules •Polyethylene(HD/LD/LLD) granules •PP/PE off-grade & near prime granules •PVC &PET flakes and re-grind </td> </tr> <tr> <td colspan="2"> <p>Plastics (finished products)</p> <ul style="list-style-type: none"> •Plastic films & bags </td> </tr> </table> | | | <p>Metals (raw materials)</p> <ul style="list-style-type: none"> •Shredded & Heavy melting steel •Shredded aluminum & stainless steel •Used pipes and plates & structural steel •Clean non-ferrous scraps | <p>Plastics(raw materials)</p> <ul style="list-style-type: none"> •Polypropylene (PP) granules •Polyethylene(HD/LD/LLD) granules •PP/PE off-grade & near prime granules •PVC &PET flakes and re-grind | <p>Plastics (finished products)</p> <ul style="list-style-type: none"> •Plastic films & bags | |
| <p>Metals (raw materials)</p> <ul style="list-style-type: none"> •Shredded & Heavy melting steel •Shredded aluminum & stainless steel •Used pipes and plates & structural steel •Clean non-ferrous scraps | <p>Plastics(raw materials)</p> <ul style="list-style-type: none"> •Polypropylene (PP) granules •Polyethylene(HD/LD/LLD) granules •PP/PE off-grade & near prime granules •PVC &PET flakes and re-grind | | | | | |
| <p>Plastics (finished products)</p> <ul style="list-style-type: none"> •Plastic films & bags | | | | | | |
| <p>SERVICES</p> <p>Hazardous Waste Management Incineration turnkey solution including engineering, construction and operation/maintenance offer thru Kawoosh subsidiary.</p> <p>HVAC & Facility Management MRC offers HVAC & facilities management services thru United Engineering Services</p> <p>Cleaning & Janitorial Services Performing general cleaning works contracts across Kuwait providing Janitorial, cleaning and waste collection services thru its Silver Ocean subsidiary.</p> | | | | | | |


NATASSCO.

| | | |
|---|--|--|
|  | Exhibitor Name | NATASSCO. National Advance technology & scientific solution نتاسكو الوطنية للتقدم التكنولوجي و الحلول العلمية |
| | Business Areas | Laboratory consultations , Calibration , Environments test lab. |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Email ▪ Web Page | Alqebla , alduwaliya building mozanen office #167 00965 25749595 00965 25711300 00965 66720705 Email : mohdhmdan@natassco.com Web Page : NATASSCO.com |
| Company Profile | NATASSCO (National Advanced Technology and Scientific Solutions) is a local company based in Kuwait owned and managed by local expertise Kuwaitis , with business cooperation branches in neighboring countries in the UAE, and the Kingdom of Saudi Arabia. We provide consultation services to laboratories in all respects according to international standards. In addition to this: We prepared to give our experience in the field of weighing system solution and calibration, lab , industrial Field and environment and the supplys of all the equipment of the laboratory | |
| Products and Services | <ul style="list-style-type: none"> • Laboratory consultations • Weight system solution • Calibration • Environments test lab. • Laboratory full supply | |


TECTRON ELECTRONIC APPLIANCES CO. W.L.L

| | | |
|--|---|--|
|  | Exhibitor Name | Tectron Electronic Appliances Co. W.L.L |
| | Business Areas | The State of Kuwait |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | Old Shuwaikh Industrial Area Block 1, Street 6. Plot 24, Shuwaikh , Kuwait 24830775 - 24814623- 24847750 24840801 TecAdmin@tectron.com.kw www.Tectron.com.kw |
| Company Profile | <p>Tectron Co. is a 100% Kuwait registered and kuwait based entity- Established in the year 1978.</p> <p>As a well known Distributor and Professional Service Contractor, the Company has succeeded in establishing long lasting Cooperation Agreements with renowned International Manufacturers and Suppliers of first class products and After- Sales Service – Further, the company is registered as specialized contractor with all Kuwaiti Government Ministries, Authorities, Institutions and Industry.</p> | |
| Products and Services | <ul style="list-style-type: none"> • Health Care Services, Medical Equipment & Supplies • Clinical laboratory Instruments & Supplies • Diagnostic & Life Science Products • Analytical Analyzers & Educational Supplies • General Instruments & Machinery • Business Contractor & Solution Services • Technical Services & Maintenance | |
| <p>Tectron Co. is split in SIX Divisions:</p> <ol style="list-style-type: none"> 1. Health Care Service Sector Products (=HCS) 2. Diagnostics and Life Science (=DLS) 3. Analytical Instruments & Consumables (=AIC) 4. General Instruments and Machinery (=GIM) 5. Technical Service and Maintenance (=TSM) 6. Business Consultancy & Solutions Service (=BCS) <p>Tectron clients are being found in nearly all Government Ministries & Institutions, National Companies and the Private Sector. - The company is very active in the Health Care Sector Projects as it is specialized in selling and servicing Medical Fittings, Devices and Laboratory Instruments with all required Consumables. Further, the Analytical instruments and Chemicals Supplies Division offers their services to Research Institutes, the Kuwait University and Educational Authorities plus to the Local Industry like Oil Sector Industry and for Quality Control Laboratories. - Some other clients of the Company are located in the Food Processing and Food handling Sector.- Tectron Co. offers Laboratory Instruments of latest technology, Automated Packaging Machines, Electronic Weighing Scales, Intelligent Identification Devices and Data Collection Systems plus all required Consumables. - Activities of International Contractors and Consultants can be integrated into Tectron Co.'s local Marketing Program provided their services complement Tectron Co.'s Business Strategy.</p> | | |

KUWAIT FIRE SERVICE DIRECTORATE

| | | |
|--|---|---|
|  | Exhibitor Name | Kuwait Fire Service Directorate |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | Area : Mubarak Al-Abdullah Al-Jaber west of Musharraf region Block : 7 Street : 9 On the fast sixth road - Jasem Mohamed Al-Kharafi road Tel : 22056888 Email : KFSD@KFSD.GOV.KW Web. : www.kfsd.gov.kw |
| KFSD History <p>State of Kuwait was among the most important states which followed the development quickly after exploration of oil, where the great need for the available of fire services for Kuwaiti society from one side and for its connection with other sectors in Kuwait from other side. In 1946, Kuwait people were using primitive methods to fight fire by using donkeys and mules to pull water cab. For a 1947, tankers supplied with a hose and a pump to help people in extinguishing fire. Another tankers was brought to be an assistant in 1949 and according to the increase of fire services need. In 1950, fire brigades were supplied with a new four vehicles with 30 fire men, until fire station was established in public works garage and was called station (2), another in shuwaikh called station (3) supplied with a vehicle and (16) fire men joining to public works and municipality brigades. During 1959-1960, in old port a fire station was established, called station No. (5) supplied with an ambulance, a tanker, a year after number of secondary school graduates worked in fire stations, fire fundamentals, and sent to UK to be qualified as fire officers.</p> | | |
| KFSD TARGETS- AIMS <p>MAIN AIM Providing the required protection for lives and properties from fires , crashes (collapses) , incidents and natural disasters (catastrophes) and preventing them by the above mentioned general aim , there are two main purposes to be considered :</p> <p>FIRST :Protecting lives and properties by applying precautionary \ preventive conditions according to the used activity to prevent fire accidents \ incidents .</p> <p>SECOND :Protecting lives and properties by direct dealing with fire incidents and handling the situations with less loss .</p> <p>Strategic Aims for these purposes :</p> <ul style="list-style-type: none"> Incidents Prevention Incidents Limitation Minimizing and Ending the fire accidents | | |


KUWAIT SCIENCE CLUB

| | | |
|---|---|---|
|  <p>النادي العلمي الكويتي KUWAIT SCIENCE CLUB</p> | Exhibitor Name | Kuwait Science Club |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page | Al zarhablock 7 at jassem al kharafi rd. Phone 22247550 Fax 22247551 info[@]ksclub.org http://www.ksclub.org |
| <p>Founded Kuwait Science Club (in <u>English</u> : Kuwait Science Club) on <u>11 August1974</u> (corresponding to <u>23 Rajab1394 AH</u>) and follows the Kuwait Science Club and the Ministry of Social Affairs and Labor, one of the associations Alf year special too <u>in Kuwait</u> , manages the club 's board of directors independently composed of nine people require membership general meeting of the club and are elected by direct secret ballot once every two years, and specializes Council define the policies, goals and action plans for the club and supervise the operation and regularly reviewed.</p> <p>The general objectives of Scientific Kuwaiti Club</p> <p>Contribute to the dissemination of scientific culture among community groups.</p> <ul style="list-style-type: none"> • Work to increase the level of scientific and scientific competence of associates in various disciplines. • Creating and caring for appropriate scientific environment. • Documentation and promotion of religious, moral, educational and national values among the members of the Scientific Club. • Contributing to the discovery of associate tendencies and directing proper guidance. • A closer relationship between science club, clubs and other local, Arab and international scientific institutions. • Development of scientific trend among club members. • Fill leisure time when something useful | | |
| <p>Kuwait Science Club activities</p> <p>Kuwait Science Club for a prominent role in the training of young people to practice scientific hobbies and hung out with conviction and willingly provides scientific club following its affiliates activities:</p> <ol style="list-style-type: none"> 1. The establishment of camps, forums and symposiums, lectures, competitions, exhibitions and scientific trips. 2. Training young people to live with the means and the machinery and tools to work on the business and scientific skills and the arts in the sections and the existing branches in the club's workshops. 3. The preparation and implementation of the different scientific activities that help with training on scientific research, experiments, research and scientific projects through collective work or work team or individual activities. 4. Cooperation and communication of various scientific institutions that help the scientific talent and skills development. | | |
| Presentation or Poster <ul style="list-style-type: none"> ▪ Presenter ▪ Presentation Title | Chemistry Experiment show and student chemistry project | |

The Public Authority of Agriculture Affairs and Fish Resources

| | | |
|---|--|---|
|  | Exhibitor Name | The Public Authority of Agriculture Affairs and Fish Resources |
| | Business Areas | Animal, plant & fish wealth faire management and production |
| | Contacts | <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web Page <p>Animal research and laboratories center 22251519 www.paaf.gov.kw</p> |
| Company Profile | The Public Authority of Agriculture Affairs and Fish Resources | |
| Products and Services | <ul style="list-style-type: none"> – Supervise animal breeding, management and production. – Control both milk (raw) production in Kuwait . – Control feed of animals. – Animal health services (diagnoses of diseases, treatment, supervision). | |
| Presentation or Poster | <ul style="list-style-type: none"> ▪ Presenter ▪ Presentation Title <p>Sharing in the exhibition by flyers, posters and samples.</p> | |
| Authorized Agent for : | Milk (raw) & animal feed control | |

KUWAIT INSTITUTE FOR SCIENTIFIC RESEARCH

| | | |
|---|--|---|
|  | Exhibitor Name | Kuwait Institute for Scientific Research |
| | Contacts <ul style="list-style-type: none"> ▪ Address ▪ Phone ▪ Fax ▪ Email ▪ Web | P.O. Box 24885 Safat, 13109, Kuwait (+965) 24989000 (+965) 24836637 marketing@kisir.edu.kw www.kisir.edu.kw |
| Company Profile | <p>The Kuwait Institute for Scientific Research (KISR) is a pioneering, independent, national institute of scientific excellence. Set up in 1967, KISR’s initial role was dedicated to developing three fields of national importance as follows: Petroleum, desert agriculture, and marine biology. Since then, KISR’s role and responsibilities have expanded greatly to include the advancement of national industry and the undertaking of studies to address key challenges, such as the preservation of the environment, sustainable management of Kuwait’s natural resources, responsible management of water and energy, and development of innovative methods of agriculture, now KISR has four research centers, Petroleum Research center, Energy and Buildings Research Center, Water Research Center, and Environment and Life Sciences Research Center.</p> <p>KISR’s approach to meeting challenges is distinguished by a culture of openness, a commitment to our clients, and an integrated, cross-disciplinary approach. KISR routinely embarks on strategic partnerships with other regional and international institutes, agencies, and academic bodies, allowing an exchange of knowledge and expertise. Today, KISR is home to over 580 researchers and engineers and over 100 laboratories, housed at 9 locations, with growth expected through the implementation of a new strategic plan. KISR conducts scientific research and performs technological consultations, often in partnership with other regional and international institutions for governmental and industrial clients in Kuwait, the Gulf region, and the rest of the world. These partnerships, driven by a philosophy of collaboration that runs deep within our culture, help build up our knowledge base, and facilitate the free flow of information, data, and expertise. This adds value to our clients’ business and ensures that the resources needed to confront the challenges we face are always available on demand.</p> | |