

Dr Abdussalam K. Qaroush

Assistant Professor-Organic Chemistry

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National Researcher Number: 12426



Activity Profile

- (12/03/2018- Up to now) **Assistant Professor**, Chemistry Department, The University of Jordan (UJ).
- (29/01/2017- 11/03/2018), Lecturer, Chemistry Department, The University of Jordan (UJ).
- (14/02-1/09/2016). Part-time lecturer, German Jordanian University (GJU).
- (1/08/2015-Up to now). *Visiting Assistant Researcher*, Chemistry Department, TUM (JoSTA Initiative)
One of 30 Jordanian scientists and technologists abroad (JoSTA) that was initiated in August, 2015. The call was made by the Jordanian Higher council of Science and Technology (HCST). Technology transfer upon working with Jordanian peers is a must to ensure the end product
(Top 100 Universities, 64 QS ranking (2018), 50 Shanghai ranking (2017)).
- (12/08/2015-31/07/2014). *Researcher*, Chemistry Department, TUM.
- (01/07/2009-11/08/2014). *PhD Candidate* (Fellowship), Chemistry Department, TUM, Germany.
- (03/08/ 2008 – 30/06/2009). *Chemistry Tutor*, Islamic Educational College (IGCSE-GCE System).
- (09/09/2007 – 02/08/ 2008). *Teaching Assistant*, Chemistry Department, Hashemite University.
- (18/05/2007 – 08/09/2007). *Research Assistant*, Chemistry Department, Hashemite University.
- (01/09/2004-/17/05/2007). M. Sc. in Chemistry (Fellowship).
- (01/10/2000-30/06/2004). B. Sc. in Chemistry.

Education

- **PhD in Macromolecular Chemistry (2009-2014) (Supervised by: Prof. Dr. Bernhard Rieger)**
Technische Universität München (TUM), Munich, Germany.
PhD candidate: Dissertation topic “CO₂ Activation Using Nitrogen Bearing Donors: Capturing of CO₂ Using [n]-oligoureas as Novel Green Sorbents”. It deals with different approaches to capture CO₂ by task-specific ionic liquids (TSILs) and their polymeric correspondents (PILs), as well as a newly invented material, *viç*: [n]-oligoureas, as solid sorbents, using propylene carbonate as a green carbonylating agent.
- **Master of Science, Chemistry (2004-2007) (Supervised by Prof. Dr. Adnan Abu-Surrah)**
Hashemite University, Zarqa, Jordan.
M Sc. Chemistry: Thesis entitled "Synthesis and Characterization of Some Iron(II) and Cobalt(II) Complexes Containing 2,6-Bis(imino)pyridine- and Salen-based Tridentate Ligands: Evaluation of the Complexes as Catalysts for Polymerization of Acrylates".
- **Bachelor of Science, Chemistry (2000-2004)**

Hashemite University, Zarqa, Jordan.

Software Skills

- Microsoft office®, Chemoffice®-Ultra 13.0.2.3021, Corel Photo-paint X6 16.3.0.1114, in addition to actively supervising/manipulating software packages as in Mettler-Toledo MMIR45m RB04-50 provided with pressure vessels (50 ml-autoclave), CEM-discover (S-class) microwave reactor, along with different analytics/instrumentation such as IR, EA, TGA, DSC, GPC, and NMR.

Languages & Soft skills

- **Arabic** (mother tongue), **English** (Advanced, fluency in both written and spoken English), and **German** (Basic level, A1). Target-oriented, team-player, research developer, innovative, knowledge of schlenk techniques, glove box, autoclave manipulation. **Hobbies:** Swimming, football, solving puzzles, and cooking.
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Awards & Prizes

- Dr.-Ing. Leonhard-Lorenz-foundation's research grant-2014.
 - German Chemical Society (**GDCh**) Travelling Grant to Gordon Research Conference-Green Chemistry, Hong Kong, China, 2014.
 - Technical University of Munich-Graduate School (**TUM-GS**) Travelling Grant to 243rd ACS meeting, Philadelphia, USA, 2012.
 - **Best Poster Presentation**, (European-Asian Chemical Conference of Chemical Sciences, Eu-AsC₂S-11, Deadsea, Jordan, 2010.
 - A Fully-Funded PhD fellowship due to a (**TUM/KAUST**) Joint Venture.
 - **Best Winning M. Sc. Lecture**, "1st Jordanian Chemical Symposium for M. Sc. and B. Sc. Students" Moutah University, Al-Karak, Jordan, 2006.
 - A Fully-Funded M. Sc. fellowship, Hashemite University.
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Research Interest

- **Carbon Capture and Sequestration and Utilization (CCS & CCU)**

Synthesis of novel materials for the capturing of CO₂. I was primarily involved in the development of 'Green Sorbents' for the capture of CO₂. Syntheses of these materials were following Green Chemistry protocols. Interest is based on the utilization of cheap resources to make efficient sorbents with best working performances at ambient conditions.

- **Homogeneous Catalysis & Polymer Synthesis (Organic Chemistry, 8+ modules)**

Synthesis of biodegradable plastics starting from CO₂ is a must that can be used in plastic bags or packaging industries. Synthesis of novel materials all the way through coordination polymerization, and controlled radical polymerization. Furthermore, preparation of **organic monomers** starting from commercially available renewable resources. In addition, development of synthetic protocols under mild reaction conditions.

- **Molecular Catalysis & Activation of Small Molecules**

Synthesis and development of useful inexpensive, commercially available-, economically viable starting materials *e.g.* CO₂, that can be applied in organic synthesis followed by finding new applications, in multidisciplinary fields such as polymerization, Catalysis, Green chemistry, and Ionic liquids.

- **Organometallic Bio- & Inorganic Chemistry**

Design, synthesis and characterization of transition metal-based complexes ‘know-hows’ that can be applied as catalysts for polymerization reactions and organic synthesis, or even testing its bioactivity. Medicinal applications of the synthesized complexes as antitumor agents, and their utilization in medicinal chemistry.

**Internships
& Training
Courses**

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- ***Sustainable Development Through Effective Knowledge Sharing***, Center for international Migration (CIM), 18 Hrs, 5th February – 6th February, 2017, Jordan Valley Marriott Hotel, Jordan. ***University Industry Collaboration Workshop -Cooperation Opportunities and Challenges–***, German Jordanian University, 1st, June, 2016, Al Mushaqqar, Jordan.
 - ***E-Camp! Enterprising Knowledge***, “Discover your entrepreneurial opportunities – develop market perspectives for your research!” +50 Hrs, 25th February – 2nd March, 2013, TUM Entrepreneurship Research Institute, TUM, Germany.
 - ***Giving Academic Talks***, 10 Hrs, Carl V. Linde Academy/Central institute of TUM, TUM, Germany.
 - ***Responsible Future Life and Career Plans***, 14 Hrs, 14th TUM-GS ‘Kick-off Seminar’, 13th-16th, November, 2012, Frauenchiemsee, Germany.
 - ***Surviving Complex Projects***, 14 Hrs, Carl V. Linde Academy/Central institute of TUM, TUM, Germany.
 - ***Presenting Convincingly and Self-Confidently***, 16 Hrs, Carl V. Linde Academy/Central institute of TUM, TUM, Germany.
 - ***Research Internship to KAUST Catalysis Center (KCC) which Spanned from*** May, 2nd - June, 25th/2011, Thuwal, KSA. Prof. J.-M. Basset.
 - ***Introduction to IR Spectroscopy***, +30 Hrs, February, 28th – March, 18th /2011, TUM, Germany.
 - ***British Council Trainer Training***, 30 Hrs, Islamic Educational College, Jordan.
 - ***Education and Evaluation Technology***, 18 Hrs, Hashemite University, Jordan.
 - ***E-Learning: Lectora***[®], ***Blackboard***[®], ***Tegrity***[®], ***Elluminate***[®], 30 Hrs, Hashemite University, Jordan.

**Professional
Membership**

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- American Chemical Society (ACS).
 - Jordanian Chemical Society (JCS).
 - CO₂Chem Network.
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9. A. F. Eftaiha, F. Alsoubani, K. I. Assaf, W. M. Nau, C. Troll, and **A. K. Qaroush***, Chitin-acetate/DMSO as a supramolecular green CO₂-phile, *RSC Adv.*, **2016**, 6, 22090-22093. **(ISI Journal)**
 10. A. S. Abu-Surrah, M. Sunjuk, K. A. Abu Safieh, **A. K. Qaroush**, and F. M. Al-Qaisee. “ γ -Diimine Palladium(II) Based Complexes Mediated Atom Transfer Radical Polymerization of Methyl Methacrylate”. *Arab. J. Chem.*, **2013**, 10 (S1), S1209-S1215. <http://dx.doi.org/10.1016/j.arabjc.2013.02.019>. **(ISI Journal)**
 11. M. Sunjuk, A. S. Abu-Surrah, E. Al-Ramahi, **A. K. Qaroush**, and A. Saleh. “Selective coupling of carbon dioxide and epoxystyrene *via* salicylaldimine, thiophenaldimine, and quinolinaldimine- iron(II), iron(III), chromium(III) and cobalt(III)/Lewis base catalysts”. *Trans. Met. Chem.*, **2013**, 38(3), 253-257. **(ISI Journal)**
 12. A. S. Abu-Surrah, K. A. Abu Safieh, I. M. Ahmad, M. Y. Abdalla, M. T. Ayoub, **A. K. Qaroush** and A. M. Abu-Mahtheieh. “New Palladium(II) Complexes Bearing Pyrazole-Based Schiff Base Ligands: Synthesis, Characterization and Cytotoxicity”. *Eur. J. Med. Chem.*, **2010**, 45, 471–475. **(ISI Journal)**
 13. **A. K. Qaroush***, D. A. Castillo-Molina, C. Troll, M. A. Abu-Daibes, H. M. Alsyouri, A. S. Abu-Surrah and B. Rieger. [n]-Oligourea-Based Green Sorbents with Enhanced CO₂ Sorption Capacity. *ChemSusChem*, **2015**, 8, 1618-1626. **Highlighted in decoded Science**. <http://www.decodedscience.com/green-chemistry-to-capture-carbon-dioxide/53984>. **(ISI Journal)**
 14. **A. K. Qaroush**, A. S. Al-Hamayda, Y. K. Khashman, S. I. Vagin, C. Troll, and B. Rieger. “Highly Efficient Isocyanate-Free Microwave-Assisted Synthesis of [6]-Oligourea”. **Hot Article**. *Catal. Sci. Technol.*, **2013**, 3, 2221-2226. **(ISI Journal)**
 15. **A. K. Qaroush**, A. S. Al-Hamayda, Y. K. Khashman, S. I. Vagin, C. Troll, and B. Rieger. *Catal. Sci. Technol.*, **2013**, 3, 2150-2150, DOI: 10.1039/C3CY90028B. **(Privileged with an inside cover page)**.
 16. A. S. Abu-Surrah; R. Ghanem, and **A. K. Qaroush**, “Well-defined Metal Complexes-Catalyzed Polar Polymer Synthesis”, A. S. Abu-Surrah, and K. Ibrahim (Eds.), “Polymerization of vinyl monomers *via* transition metal-based catalysts bearing bis(imino)pyridine ligands”, Research Signpost, **2008**. ISBN: 978-81-7895-368-7. **(Chapter in a review book)**
 17. A. S. Abu-Surrah, and **A. K. Qaroush**. “Polymerization of Vinyl Monomers *via* MAO Activated Iron(II) Dichloro Complexes Bearing Bis(imino)pyridine-, Quinolinaldimine and Thiophenaldimine Based Tridentate Nitrogen Ligands”. *Eur. Polym. J.*, **2007**, 43, 2967–2974. **(ISI Journal)**
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B. Oral Presentation:

1. **A. K. Qaroush**, [n]-Oligourea-based Green Sorbents as Novel Materials for the Capturing of CO₂. **Oral Presentation, Invited speaker**, Hamdi Mango Center for Scientific Research (HMCSR)-Jordan University, Amman, Jordan, May, 7th, **2015**.

2. **A. K. Qaroush**, [n]-Oligourea-based Green Sorbents as Novel Materials for the Capturing of CO₂. **Oral Presentation, *Invited speaker***, International Conference for Advanced Materials (ICAM2015), Jordanian University for Science and Technology (JUST), Irbid, Jordan, April, (27th-29th), **2015**.
3. **A. K. Qaroush**, [n]-Oligoureas as Green Sorbents for the Capturing of CO₂. **Oral Presentation**, 14th Jordanian Chemical Conference (IVX-JCC), Al al-Bayt University, Mafrqa, Jordan, April, (8th), **2015**.
4. **A. K. Qaroush**, D. A. Castillo-Molina, C. Troll, and B. Rieger, “[n]-Oligoureas as Novel Green Solid Sorbents for the Capturing of CO₂”, **Oral presentation**, Gordon Research Conference on Green Chemistry, Hong Kong, China, (27th, July-1st August), **2014**.
5. **A. K. Qaroush**, Cyclic Carbonates as Valuable Carbonylating Agents: From Synthesis to Application., **Oral Presentation, *Invited speaker***, Hashemite University, Zarqa, Jordan, 29th, November, **2012**.
6. **A. K. Qaroush**, Schiff Base Containing Late Transition Metal Based Complexes as Chemoselective Catalysts for the Synthesis of Styrene Carbonate. **Oral Presentation**, International Conference on Sciences-2012 (ICS), Al al-Bayt University, Mafrqa, Jordan, November, (20th-22nd), **2012**.
7. **A. K. Qaroush**. "Synthesis of New Penta-Coordinated Iron(II) and Cobalt(II) Complexes Bearing Bis(Imino)Pyridine-, Salicylaldimine-, and Quinaldimine- Based Tridentate Ligands" **Oral Presentation, *Best Winning M. Sc. Lecture***, “1st Jordanian chemical symposium for M. Sc. and B. Sc. Students”, April 26th, **2006**, Al-Karak, Jordan.

C. Posters:

1. **A. K. Qaroush**, D. A. Castillo-Molina, C. Troll, and B. Rieger, “[n]-Oligoureas as Novel Green Solid Sorbents for the Capturing of CO₂”, *Poster*, Gordon Research Conference on Green Chemistry, Hong Kong, China, (27th July-1st August), **2014**.
2. **A. K. Qaroush**, C. Troll, and B. Rieger. “Propylene Carbonate as a Green Carbonylating Agent: A Novel Methodology for the Synthesis of [n]-Oligourea”, *Poster*, International Conference on Sciences-2012 (ICS), Al al-Bayt University, Mafrqa, Jordan, November, (20th-22nd), **2012**.
3. **A. K. Qaroush**, C. Troll, and B. Rieger. “Novel Task Specific Ionic Liquids as Sorbents for the Capture of CO₂”, *Poster*, “Carbon Dioxide as Feedstock for Chemistry and Polymers”, Essen, Germany, October, (10th-11th), **2012**.
4. **A. K. Qaroush**, A. S. Al-Hamayda, Y. K. Khashman, V. D’Elia, S. I. Vagin, C. Troll, and B. Rieger. A New Organocatalyzed Microwave-Assisted Isocyanate-Free Synthesis of [n]-Oligourea: A New energy-saving, eco-friendly method generating Oligourea Using Green Chemistry Approaches, *Poster*, **244th ACS national meeting**, Philadelphia, Pennsylvania, United States. August, (19th–23rd), **2012**.
5. **A. K. Qaroush**, Y. Li, C. E. Anderson, S. Y. T. Lee, K. Salmeia, A. Monassier, C. Troll, M. Cokoja, F. E. Kühn, and B. Rieger. CO₂ as a Building Block for the Synthesis of Cyclic Urea/Urethanes, *Poster*, European-Asian Chemical conference of chemical Sciences, Eu-AsC₂S-11, Deadsea, Jordan, October, (6th-10th), **2010**. ***Best Poster Presentation for all sections of chemistry.***

6. K. Salmeia, C. E. Anderson, **A. K. Qaroush**, A. Monassier, S. Y. T. Lee, C. Troll, M. Cokoja, F. E. Kühn, and B. Rieger. Poly(propylene carbonate): Physical Properties and Microstructure”. *Poster*, European-Asian Chemical conference of chemical Sciences, Eu-AsC₂S-11, Deadsea, Jordan, October, (6th-10th), **2010**.
7. A. Monassier, S. Y. T. Lee, Y. Li, **A. K. Qaroush**, K. Salmeia, C. E. Anderson, C. Troll, M. Cokoja, F. E. Kühn, and B. Rieger. “Molecular Activation of CO₂: Synthetic Routes towards New Activating Complexes”. *Poster*, European-Asian Chemical conference of chemical Sciences, Eu-AsC₂S-11, Deadsea, Jordan, October, (6th-10th), **2010**.
8. S. Y. T. Lee, A. Monassier, Y. Li, **A. K. Qaroush**, K. Salmeia, C. E. Anderson, C. Troll, M. Cokoja, F. E. Kühn, and B. Rieger. “Formation of Methyl Acrylate from CO₂ and Ethylene *via* Methylation of Nickelalactones”. *Poster*, European-Asian Chemical conference of chemical Sciences, Eu-AsC₂S-11, Deadsea, Jordan, October, (6th-10th), **2010**.
9. **A. K. Qaroush**, F. M. Alqaisi, and A. S. Abu-Surrah. “ α -Olefin-Functionalized Polymers with MAO Activated Iron(II) Dichloro Complexes Bearing Bis(imino)pyridine-, Quinaldimine- and Thiophenaldimine-based Tridentate Nitrogen Ligands”. *Poster*, 7th Jordanian International Conference in Chemistry [7th JCC], Al al-Bayt University, Mafraq, Jordan. March, 1st, **2007**.
10. F. M. Alqaisi, **A. K. Qaroush**, Hamzeh M. Abdel-Halim, and Adnan. S. Abu-Surrah. “Synthesis and Characterization of New Iron (III), Cobalt(III) and Chromium(III) with N \cap N and N \cap O Schiff Base Ligands”. *Poster*, 7th Jordanian International Conference in Chemistry [7th JCC], Al al-Bayt University, Mafraq, Jordan. March 1st, **2007**.
11. **A. K. Qaroush**, F. M. Alqaisi, and A. S. Abu-Surrah “Synthesis of New Penta-Coordinated Iron(II) and Cobalt(II) Complexes Bearing Bis(Imino)Pyridine-, Salicylaldimine- and Quinaldimine- Based Tridentate Ligands”. *Poster*, “1st Jordanian chemical symposium for M. Sc. and B. Sc. students”, Al-Karak, Jordan, April 26th, **2006**.
12. F. M. Alqaisi, **A. K. Qaroush**, Hamzeh M. Abdel-Halim, and Adnan. S. Abu-Surrah. “Synthesis and Characterization of New Iron (III), Cobalt(III) and Chromium(III) Based Complexes Bearing Nitrogen Ligands: Evaluation of the Complexes as Catalysts for Oxidation of Amino Acids”. *Poster*, “1st Jordanian chemical symposium for M. Sc. and B. Sc. students” Al-Karak, Jordan, April 26th, **2006**.
13. **A. K. Qaroush**, F. M. Alqaisi, and A. S. Abu-Surrah “ α -Olefin-Functionalized Polymers *via* 2,6-Bis(Imino)Pyridine Iron(II)-Based Catalysts”. *Poster*, the 6th Jordanian International Conference in Chemistry, Zarqa, Jordan, December 12th, **2005**.

Amman, 25/11/2018

Signature:

