

Dr. Rakan M. Altarawneh

(Associate Professor)

H-Index: 11

I.10-Index: 13

Energy and Electroanalytical
Chemistry, Ph.D.



Dr. Rakan Altarawneh is the Head of the Energy and Electroanalytical Chemistry Laboratory (ECL) at Mutah University. His research focuses on a variety of topics, with a focus on basic research and research applications in industrial and environmental applications for advanced materials for sustainable energy and applications. Current areas include catalysts for ethanol fuel cells and electrochemical-analytical methods for measurements of organic and inorganic pollutants. He received a full scholarship to complete his bachelor's and master's degrees from Mutah University in Jordan; after that, he got a full scholarship from Mutah University to join Memorial University of Newfoundland, Canada, to pursue his Ph.D. Since then, he has started his new career as a faculty member in the Chemistry and Industrial Chemistry Department at Mutah University.

Personal:

- Marital Status: Single.
- Date of Birth: 31/7/1985.
- Nationality: Jordanian.
- Place of Birth: Al-Karak-Jordan.
- Languages: Arabic (mother language).
 - English (Excellent in speaking, writing, and reading).
 - International English Language Testing System (IELTS).

Phone: +962 3 2372 380 Ext. 3089

Mobile: +962 776193935

E-Mail: rma766@mutah.edu.jo
rma766@mun.ca
tarawneh.rakan@yahoo.com

Website: www.mutah.edu.jo

Objectives:

- To improve the experience in the project's environment.
- Working within a dynamic team and recognized project.
- Increasing management, technical, and communication skills.
- Exploitation of theoretical knowledge in the practical work fields.

Education

- 2015 - 2018 **Memorial University of Newfoundland, NL, Canada**
Doctor of Philosophy, Energy and Electroanalytical Chemistry.
 Thesis title: “Product distributions and efficiencies for ethanol oxidation in proton exchange membrane electrolysis cells”.
- 2008 - 2012 **Mutah University, Al-Karak, Jordan**
Master of Science, Analytical Chemistry.
 Rank: 1st of my class (Excellent degree,” Honored”).
 Thesis title: “Multiresidue Analysis of Pesticides in Soil Profile from the Jordan Valley using GC-ECD”.
- 2003 - 2007 **Mutah University, Al-Karak, Jordan**
Bachelor of Science, Chemistry.
 Rank: 1st of my class.
- 2002 - 2003 **Secondary Education Certificate for Scientific Stream from Karak, Jordan from Al-Karak, Jordan**

Awards

- Recognition of Excellence** 05/2018
Awarded by the Dean of Graduate Studies - Memorial University of Newfoundland, NL, Canada
- Research Excellence Award** 03/2018
Awarded by the Graduate Students' Union - Memorial University of Newfoundland, NL, Canada
- Chen Award** 01/2018
Awarded by the Department of Chemistry - Memorial University of Newfoundland, NL, Canada
- Honor Award** 07/2012
Awarded by the Deanship of Graduate Studies- Mutah University, Al-Karak, Jordan

Sponsorships

- ✓ Full scholarship from His Majesty King Abdullah Bin Husain II, B.Sc., Mutah University, Al-Karak, Jordan.
- ✓ Full scholarship from Mutah University, Ph.D., Memorial University, NL - Canada.

Grants

- Mutah University Grant No. 349/2020.** 2020
"Evaluation of the antioxidant and inhibitory activity of medicinal plant extracts in Jordan."
Fund of **18000 USD**. Jordan.
- Mutah University Grant No. 450/2021.** 2021
"Making and characterizing new anode catalysts with higher performance for proton exchange membrane fuel cells".
Fund of **93000 USD**. Jordan.
- Mutah University Grant No. 580/2022.** 2022
"Green synthesis of metal-based nanoparticles and their multifaceted applications in the simultaneous removal of heavy metals and organic contaminants".
Fund of **28000 USD**. Jordan.
- Mutah University Grant No. 766/2023.** 2023
"Design, Synthesis of Metals, Metal Oxides, and Polymers Nanomaterials: Applications in Environmental and Medical Fields".
Fund of **127000 USD**. Jordan.

Memberships

<i>The Electrochemical Society (ECS)</i>	<i>United States</i>
<i>Chemical Institute of Canada (CIC)</i>	<i>Canada</i>

Committees

Conferences and Workshops Committees:

- Organizing committee member of the 10th Jordan International Chemical Engineering Conference "JICHEC10". JICHEC10 aims to address and connect current issues in research and applications in the various fields of industrial, systems, and manufacturing engineering
- Organizing member of the Scientific Committee of the 18th Jordanian Chemistry Conference. Research Partnerships: Successes and Future Directions symposium aims to address and connect current issues in research and applications in the various fields of science and Engineering, the Hashemite University, Jordan, 2023.

Committees Membership:

- Department Level:*
- ✓ Chairman of the Graduate Studies, Quality Assurance, E-learning development, Scientific Research, and the Qualifying Exam Committees.
 - ✓ Member of the Laboratories Update, and the Dep. Self-Assessment Committees.

Faculty Level: ✓ Member of the Strategic Plan, Renewable Energy, Scientific Research, Faculty Self-Assessment, Quality Assurance, Social and Cultural, Safety, and E-learning Development Committees.

University Level: ✓ Member of the Renewable Energy, Innovation and Communication with Industry, the Quality Assurance, the International Classifications (QS), and DAAD Committee for MA-level student selection for scholarship nomination Committees.

Administration Experiences

2022 - present	Chemistry and Industrial Chemistry Department Head, Faculty of Science, Mutah University, Al-Karak, Jordan.
2020 - 2022	Assistant Dean for Student Affairs and Quality Assurance, Faculty of Science, Mutah University, Al-Karak, Jordan.
2019 - 2020	Chemistry and Industrial Chemistry Department Representative at Faculty Council, Faculty of Science, Mutah University, Al-Karak, Jordan.

Academic Experiences

2023 - Present	Associate Professor of Energy and Electroanalytical Chemistry, Department of Chemistry and Industrial Chemistry, Mutah University, Al-Karak, Jordan.
2018- 2023	Assistant Professor of Energy and Electroanalytical Chemistry, Department of Chemistry and Industrial Chemistry, Mutah University, Al-Karak, Jordan.
2015 - 2018	Ph.D. student and Research Assistant, Memorial University of Newfoundland, NL, Canada.
2007 - 2014	Chemistry Teacher: Teaching chemistry and science courses in different schools for different levels in the Ministry of Education /Jordan.

Teaching Experience

2018- present

Undergraduate Level	General Chemistry (1 & 2), General Chemistry Labs (1 & 2), Analytical Chemistry (1 & 2), Analytical Chemistry Lab, Instrumental Methods of Analysis (1 & 2), Instrumental Methods of Analysis Labs, Industrial Instrumental Analysis: Methods & Applications (1 & 2), Industrial Instrumental Analysis: Methods & Applications Labs, Fuel Cells; PEMFCs, Energy Efficiency and Renewable Energy Systems.
Graduate Level	Renewable Energy Systems (RES), Fuel Cells; PEMFCs, Energy Efficiency and Renewable Energy Systems, and Electroanalytical Methods & Applications.

Fields of Interest

Our research focuses on a variety of topics, with a focus on basic research and research applications in industrial and environmental applications for advanced materials for sustainable energy and applications. Current areas include catalysts for ethanol fuel cells and electrochemical-analytical

methods for measurements of organic and inorganic pollutants.

Computer Skills

Microsoft office	Word, Excel, Access, Publisher, and PowerPoint. (MUCDL)
Language Program:	C++, Turbo C++, Basic, VB, and Interactive Data Language (IDL)

Thesis and Journal Review Activities

- ✓ “Currently a reviewer for many international journals of renewable energy systems”
- ✓ Served as an examiner (committee member) for many graduate and master thesis students.

Supervising

Supervising Graduate Students, (Master – Level):

- | | |
|-------------|---|
| 2023 | Master (Process Engineering) student – Use of Pyrolysis Oil in Fuel Cells. |
| 2022 | An effective calix[4]arene-based adsorbent for tetracycline removal from water systems Kinetic isotherm, and thermodynamic studies. |

Supervising Undergraduate Students:

- | | |
|-------------|---|
| 2023 | <ul style="list-style-type: none">➤ Comparative Study of Different Fuel Cell Technologies➤ Advances in Carbon Nanomaterials as Electrochemical Biosensors➤ Lithium – Ion Batteries➤ Biosensor Applications in the Medical Field➤ Recent Advances in Nanomaterials for Fuel-Cell Technologies. |
| 2022 | <ul style="list-style-type: none">➤ Microplastics in seawater: sampling strategies, laboratory, methodologies, and identification techniques applied to the port environment.➤ Potential biomedical application of Calcium phosphates obtained using eggshell as a bio source of calcium at different initial pH values. |
| 2020 | <ul style="list-style-type: none">➤ Design and build a safety system for gas leakage from gas-using applications.➤ Determination of heavy metals in fruits and vegetables in Jordan |

Publications:

[SCOPUS](#)

H-Index: 10

[Research Gate](#)

H-Index: 10

[Google Scholar](#)

H-Index: 11

➤ Journals Articles:

- [1] **Altarawneh R. M.** Enhancing Ethanol Electrooxidation in Acidic Media Using Pt Nanoparticles Supported on Metal Oxide-Modified Vulcan XC72 Nanocomposites. *Langmuir*. 2025 Apr 23. doi: 10.1021/acs.langmuir.5c00838. Epub ahead of print. PMID: 40265907.
- [2] Al-Madanat, O. Y., Popoola, S. A., **Altarawneh, R. M.**, Alraddadi, T. S., Alam, M. G., Al Dmour, H., ... & Said, M. A. Comparative Studies of Regeneration and Single Batch Design for the Properties of Basic Blue-41 Removal Using Porous Clay and Porous Acid-Activated Heterostructures. *Water* 2024, 17(1), 2.
- [3] Alshahateet, S. F., **Altarawneh, R. M.**, Al-Trawneh, S. A., Al-Saraireh, Y. M., Al-Tawarh, W. M., Abuawad, K. R., ... & Azzaoui, K. *Cheminformatics-based design and biomedical applications of a new Hydroxyphenylcalix [4] resorcinarene as anti-cancer agent*. *Scientific Reports* 2024, 14(1), 1-16.
- [4] Alshahateet, S. F., **Altarawneh, R. M.**, Al-Tawarh, W. M., Al-Trawneh, S. A., Al-Taweel, S., Azzaoui, K., ... & Jodeh, S. *Catalytic green synthesis of Tin (IV) oxide nanoparticles for phenolic compounds removal and molecular docking with EGFR tyrosine kinase*. *Scientific reports* 2024, 14(1), 6519.
- [5] Al-Taweel, S., Al-Saraireh, Y., Al-Trawneh, S., Alshahateet, S., **Al-Tarawneh, R.**, Ayed, N., ... & Al-Qaralleh, O.. *Synthesis and biological evaluation of ciprofloxacin-1, 2, 3-triazole hybrids as antitumor, antibacterial, and antioxidant agents*. *Heliyon*, 9(12) (2023).
- [6] Waad M. Al-Tawarh, **Rakan M. Altarawneh**, Salah A. Al-Trawneh, Solhe F. Alshahateet & Samir Al-Taweel. "An effective calix [4] arene-based adsorbent for tetracycline removal from water systems: Kinetic, isotherm, and thermodynamic studies." *Journal of Chemical Research* 47, no. 4 (2023).
- [7] **Rakan M. Altarawneh**, " Facile fabrication of new sensing platforms decorated with quinalizarin and PtNi alloy nanoparticles for highly sensitive aluminum determination", *Microchemical Journal*, 182 (2022) 107944.
- [8] **Rakan M. Altarawneh**, Ahmad M. Al-Jaafreh, Haitham Qaralleh & Omar S. Al-Qaralleh, " Chemical profiling of Punica granatum peels from Jordan using LC–MS/MS and study on their biological activities." *International Journal of Food Science and Technology* 57 (2022) 5256–5267.
- [9] Saif M. Dmour; Haitham Qaralleh; Muhamad Al-Limoun; Khaled M. Khleifat; Moath Alqaraleh; Ali Abdallah Alqudah; **Rakan M. Altarawneh**, "Antibacterial activity and synergistic effects of Eucalyptol, γ -Terpinene, p-Cymol and Punicalagin with Cefotaxime Against Methicillin (Oxacillin) Resistant *Staphylococcus aureus*." 15 (2022).
- [10] **Rakan M. Altarawneh**, "Overview on the Vital Step toward Addressing Platinum Catalyst Poisoning Mechanisms in Acid Media of Direct Ethanol Fuel Cells (DEFCs)." *Energy & Fuels* 35.15 (2021): 11594-11612.

- [11] A. Tarawneh, I. Salamon, **Rakan M. Altarawneh**, J. Mitra, and A. Gadetskaya. "Assessment of Lichens as Biomonitors of Heavy Metal Pollution in Selected Mining Area, Slovakia." *Pakistan Journal of Analytical & Environmental Chemistry* 22.1 (2021): 53-59.
- [12] **Rakan M. Altarawneh**, "Levels of selected heavy metals (Pb, Ni, Cd, and Cr) in various widely consumed fruits and vegetables in Jordan." *International Journal of Environmental Analytical Chemistry* 101.7 (2021): 1026-1033.
- [13] H. Hang, **Rakan M. Altarawneh**, T. M. Brueckner, and P. G. Pickup, *Pt/Ru–Sn Oxide/Carbon Catalysts for Ethanol Oxidation*, *Journal of The Electrochemical Society*, 167 054518 (2020).
- [14] **Rakan M. Altarawneh**, *Faradaic Efficiencies for Methanol Oxidation in Proton-Exchange Membrane Electrolysis and Fuel Cells with Various Anode Catalysts*, *Int. J. Electrochem. Sci.*, 14, 7016 (2019).
- [15] B. Chen, T. M. Brueckner, **Rakan M. Altarawneh** and P. G. Pickup, *Composition dependence of ethanol oxidation at ruthenium-tin oxide/carbon supported platinum catalysts*, *J. Electrochem. Soc.*, 165, J3019 (2018).
- [16] **Rakan M. Altarawneh** T. M. Brueckner, B. Chen and P. G. Pickup, *Product distributions and efficiencies for ethanol oxidation at PtNi octahedra*, *J. Power Sources*, 400, 369 (2018).
- [17] **Rakan M. Altarawneh** and P. G. Pickup, *Determination of the stoichiometry of ethanol oxidation from the flow rate dependence of the current in a proton exchange membrane electrolysis cell*, *J. Electrochem. Soc.*, 156, F479 (2018).
- [18] **Rakan M. Altarawneh** and P. G. Pickup, *Pt and PtRu catalyst bilayers increase efficiencies for ethanol oxidation in proton exchange membrane electrolysis and fuel cells*, *J. Power Sources*, 366, 27 (2017).
- [19] **Rakan M. Altarawneh** and P. G. Pickup, *Product Distributions and Efficiencies for Ethanol Oxidation in a Proton Exchange Membrane Electrolysis Cell*, *J. Electrochem. Soc.*, 164, F861 (2017).
- [20] **Rakan M. Altarawneh**, P. Majidi and P. G. Pickup, *Determination of the efficiency of ethanol oxidation in a proton exchange membrane electrolysis cell*, *J. Power Sources*, 351, 106 (2017).
- [21] Poster Presentations (*Presenter)
Rakan M. Altarawneh and P. G. Pickup, "Product distributions and efficiencies for ethanol oxidation in proton exchange membrane electrolysis and fuel cells". 42nd Annual Science Atlantic Chemistry Conference (ChemCon 2017), Memorial University of Newfoundland, Canada.
- [22] P. Majidi, **Rakan M. Altarawneh**, N. D. W. Ryan and P. G. Pickup, *Determination of the efficiency of methanol oxidation in a direct methanol fuel cell*, *Electrochim. Acta*, 199, 210 (2016).
- [23] Elfadil, I., Ouezzani, I., **Altarawneh, R.**, Batarseh, M., & Elazzouzi, M.. *Clean up methods for soil samples before injecting in GC/ECD*. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 6(5), 977-981 (2015).
- [24] Oral Presentations (*Presenter)
Rakan M Altarawneh*, Mufeed Batarseh. "Multi residue Analysis of Pesticides in Soil Profile from the Jordan Valley using GC-ECD". Regional Workshop of DAAD-EXCEED Project "Wastewater Treatment and Reuse" 3rd-6th June 2013, Konya-Turkey
- [25] **Rakan Tarawneh**, Mufeed Batarseh. *Multiresidue Analysis of Pesticides in Agriculture Soil from Jordan Valley*. 2013. *Jordan Journal of chemistry*. Vol. 8, No. 3.

Scoups:-

<https://www.scopus.com/authid/detail.uri?authorId=56862250000>

ResearchGate

<https://www.researchgate.net/profile/Rakan-Altarawneh-2>

Google Scholar

<https://scholar.google.com/citations?user=i-h1hgMAAAAJ&hl=en&oi=ao>

References: Available Upon Request.