

## **Dr. Mohammad W. Amer (PhD in Environmental-Analytical Chemistry)**

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### **Research Interests**

- Specialized in separation sciences, chromatographic techniques and nuclear magnetic resonance spectroscopy.
- Using NMR (solid and/or liquid, 1D & 2D) for detailed structural analysis of the fuel and petroleum materials.
- Developing the methods of using Gas Chromatography with different detector (FID, TCD, FPD and MS) for analysis of gases and fuels.
- Developing the application of comprehensive and multidimensional GC coupled with different detectors (FID, FPD and MS) for oil class separation and detailed compound identification, especially for the sulfur compounds.
- Optimizing the condition of extraction of oil from organic rich rocks such as oil shale, torbanite, coal etc. by using high temperature high pressure reactors (autoclave).
- Producing biofuels as an alternative source of energy by using food wastes, agricultural residues etc.
- Environmental and food toxicology related to determination of inorganic metal ions or organic substances.
- Developed understanding on the adsorption-desorption mechanism of different metal ions in solutions.
- Using XRD, XPS, TGA, ICP, AAS and FTIR for detailed analysis of the organic and the inorganic residues.

### **Education**

2013 Ph.D., Chemistry (Applied-Chemistry), Monash University, Melbourne, Australia.  
Dissertation title: Extraction of Oil from Oil Shale by New, More Environmentally Acceptable Methods. Supervisor Prof. Alan L. Chaffee and Prof. W. Roy Jackson.

2009 M.Sc., Chemistry (Environmental-Analytical-Chemistry), University of Jordan, Amman, Jordan. Dissertation title: Removal of Pb(II), Cd(II) and Zn(II) from Industrial Waste Water Using Jordanian Kaolinite Modified by Sodium Polyphosphate. Supervisors Prof. Fawwaz I. Khalili and Prof. Akl M. Awwad.

2005 B.Sc., Chemistry, Hashemite University, Zarqa, Jordan

### **Employment**

Sep. 2019-now	Associate Professor, Department of Chemistry, Faculty of Science, The University of Jordan, Amman, Jordan
Sep. 2015-Sep 2019	Assistant Professor, Department of Chemistry, Faculty of Science, The University of Jordan, Amman, Jordan
2018-2019	Visiting Scholar (Postdoc), School of Chemistry, Monash University, Melbourne, Australia
2015	Part time Lecturer, Prince Hussein bin Abdullah II Academy of Civil Protection, Al-Balqa Applied University, Amman, Jordan
2013-2015	Researcher in Chemistry, Scientific Research Commission, Applied Sciences, Royal Scientific Society, Amman, Jordan
2010-2013	PhD Researcher, School of Chemistry, Monash University, Melbourne, Australia
2012-2013	Teaching Associate, School of Chemistry, Monash University, Melbourne, Australia
2005-2010	Analyst, Petrol and Lubricant, Paint laboratory, Industrial Chemistry Centre, Royal Scientific Society, Amman, Jordan
2005	Chemical Analyst, Research and Development Department, , International Pharmaceutical Manufacturing Company, Amman, Jordan

### **Awards**

- *Distinguished Scholar Awards*, Arab Fund Fellowship Program, Arab Fund for Economic and Social Development, Kuwait, August 2018.
- *Postgraduate Publication Awards*, Institute of Graduate Research, Monash University, Australia, July 2013.
- *Faculty of Science Dean's International Postgraduate Research Scholarship*, Monash University, Australia, October 2010.
- *School of Chemistry Stipend Scholarship*, School of Chemistry, Monash University, Australia, October 2010.

## **Membership**

Member of Royal Australian Chemical Institute (RSC)

Member of The American Association for the Advancement in Sciences (AAAS)

Member of Brown Coal Innovation Australia (BCIA)

## **Grants**

- 2022 Supercritical extraction of oil from oil shale, Deanship of Scientific Research, University of Jordan (16000 JD)
- 2021 Extraction of oil from Jordanian oil shale by sustainable methods, iR&Df/HCST (20000 Euro)
- 2018 Removal of U and Th from aqueous solutions using modified Jordanian kaolinite, Deanship of Scientific Research, University of Jordan (8000 JD)
- 2018 Vortex assisted liquid-liquid microextraction followed by back microextraction of different fungicides, Deanship of Scientific Research, University of Jordan (10000 JD)
- 2015 Low temperature retorting of Jordanian oil shale, SRTD II (25000 Euro)
- 2015 Production of Sustainable Biobutanol as Green Gasoline of the Future, SRTD II (25000 Euro)
- 2015 Characterization of shale oil produce by direct and indirect heating methods, SRTD II (25000 Euro)
- 2014 Development a Process for Production Ultrafine Kaolin: Water-Based Paints, iR&Df/HCST (25200 JD)

## **Instrumental/apparatus skills**

- High pressure autoclave : I have experience in operating high pressure autoclaves with a capacity of 27mL, 70mL, 100mL 500mL and 4L, including safety and risk assessment, experimental design, data calculation and interpretation
- Multidimensional GC for liquid : FID, FPD, MS for oil derived products from oil shale reaction
- GC for gas : TCD for the gases generated during high temperature reaction of oil shale
- X-Ray Photoelectron spectroscopy (XPS) : Experimental design, data calculation and interpretation
- $^1\text{H}$  &  $^{13}\text{C}$  NMR for liquids and solids : Experimental design, data calculation and interpretation
- Thermogravimetric analyzer (TGA) : Experimental design (proximate and pyrolysis analysis), data calculation and interpretation including safety and risk assessment
- X-Ray Diffraction (XRD) : Experimental design, data calculation and interpretation
- ICP-MS : Experimental design, data calculation and interpretation
- UV-Vis : Experimental design, data calculation and interpretation

Spectrophotometer

XRF (sulfur analyzer) : Experimental design, data calculation and interpretation

### **Peer-Reviewed Activity**

- Journal Reviewer for *Fuel*
- Journal Reviewer for *Talanta*
- Journal Reviewer for *Food Research International*
- Journal Reviewer for *Energy & Fuels*
- Journal Reviewer for *Fuel Processing Technology*
- Journal Reviewer for *Journal of Hazardous Materials*

### **Publications**

#### Book:

Mohammad Amer, Fawwaz Khalili and Akl Awwad. Heavy Metal Adsorption: Adsorption of lead, zinc and cadmium ions on polyphosphate-modified kaolinite clay, LAB LAMBERT Academic Publishing 2010, ISBN: 3838380266 (Germany).

#### Papers Published in Refereed Journals:

1. Mohammad W Amer, Jameel S Aljariri Alhesan, AL Batool Ghassan. Ultrasonic extraction of oil shale bitumen and study of its structural features using GC-MS and NMR techniques, *International Journal of Coal Preparation and Utilization* 2022, 2119560.
2. Mohammad W Amer, Jameel S Aljariri Alhesan, Marc Marshall, Yi Fei, W Roy Jackson, Alan L Chaffee. Energy efficient method of supercritical extraction of oil from oil shale, *Energy Conversion and Management* 2022, 252, 115108.
3. Mohammad W Amer, Jameel S Aljariri Alhesan, Fawwaz I Khalili. Enhanced method for the removal of U (VI) and Th (IV) from aqueous solutions using chemically modified kaolinite, *International Journal of Environmental Analytical Chemistry* 2021, 2010726.
4. Akl Awwad, Nida Salem, Mohammad Amer, Maisa' Shammout. Adsorptive removal of Pb (II) and Cd (II) ions from aqueous solution onto modified Hiswa iron-kaolin clay: Equilibrium and thermodynamic aspects, *Chemistry International* 2021, 7(2), 139-144.
5. Akl Awwad, Maisa' Shammout Mohammad Amer. Fe(OH)<sub>3</sub> / Kaolinite Nanoplatelets: Equilibrium and Thermodynamic Studies for the Adsorption of Pb(II) Ions From Aqueous Solution, *Chemistry International* 2021, 3, 90-102.
6. Mohammad W. Amer, Akl Awwad. Green synthesis of copper nanoparticles by Citrus limon fruits extract, characterization and antibacterial activity, *Chemistry International* 2021, 7(1), 1-8.
7. Jameel S Aljariri Alhesan, Mohammad W Amer, Marc Marshall, W Roy Jackson, Yi Fei, Martin L Gorbaty, Peter J Cassidy, Alan L Chaffee. A comparison of the thermal conversion behaviour of marine kerogens isolated from oil shales by NaOH-HCl and HCl-HF methods, *Journal of Analytical and Applied Pyrolysis* 2021, 155, 105023.
8. Omar Salim Al-Ayed, Mohammad Waleed Amer, Sura Al-Harahshah, Birgit Maaten, Muhammad Sajjad Ahmed. Calculations of activation energy and frequency factors for corn leaves pyrolysis using excel solver: new concept, *International Journal of Chemical Reactor Engineering* 2021, 19(8): 799-807.

9. Mater H Mahnashi, Samer S Abu-Alrub, Mohammad W Amer, Ali O Alqarni. Kinetics and thermodynamics of enhanced adsorption of E120 dye using activated carbon, *Tropical Journal of Pharmaceutical Research* 2021, 20(3): 585-592.
10. Mohammad W. Amer, Jameel S. Aljariri Alhesan, Sawsan Ibrahim, Ghadeer Qussay, Marc Marshall and Omar S. Al-Ayed. Potential use of corn leaf waste for biofuel production in Jordan (physio-chemical study), *Energy* 2021, 214, 118863.
11. Mohammad W. Amer, Jameel S. Aljariri Alhesan, Thomas Gengenbach, Marc Marshall, Yi Fei, W. Roy Jackson and Alan L. Chaffee. Structural characteristics of low-aromaticity marine and lacustrine oil shales and their NaOH-HCl kerogens using <sup>13</sup>C NMR and XPS, *Australian Journal of Chemistry* 2020, 73(12): 1237-1249.
12. Akl Awwad, Mohammad Amer, Marwa Al-aqarbeh. TiO<sub>2</sub>-kaolinite nanocomposite prepared from the Jordanian Kaolin clay: Adsorption and thermodynamics of Pb (II) and Cd (II) ions in aqueous solution, *Chemistry International* 2020, 6(4), 168-178.
13. Akl Awwad, Mohammad Amer. Biosynthesis of copper oxide nanoparticles using *Ailanthus altissima* leaf extract and antibacterial activity, *Chemistry International* 2020, 6(4), 210-217.
14. Akl M Awwad, Mohammad W Amer, Nida M Salem, Amany O Abdeen. Green synthesis of zinc oxide nanoparticles (ZnO-NPs) using *Ailanthus altissima* fruit extracts and antibacterial activity, *Chemistry International* 2020, 6(3), 151-159.
15. Mohammad W. Amer, Jameel S. Aljariri Alhesan, Marc Marshall, Omar S. Al-Ayed and Akl M. Awwad. Low temperature retorting of Jordanian oil shales using semi-continues apparatus, *Journal of Analytical and Applied Pyrolysis* 2019 (Accepted, In Press).
16. Mohammad W. Amer, Jameel S. Aljariri Alhesan, Marc Marshall, Akl M. Awwad and Omar S. Al-Ayed. Characterization of Jordanian oil shale and variation in oil properties with pyrolysis, *Journal of Analytical and Applied Pyrolysis* 2019, 140: 219-226.
17. Jameel S. Aljariri Alhesan, Mohammad W. Amer, Marc Marshall, W. Roy Jackson, Thomas Gengenbach, Ying Qi, Martin L. Gorbaty, Peter J. Cassidy and Alan L. Chaffee. A comparison of the NaOH-HCl and HCl-HF methods of extraction kerogen from two different marine oil shales, *Fuel* 2019, 236: 880-889.
18. Mohammad W. Amer and Akl M. Awwad. Removal of As(V) from aqueous solution by adsorption onto nanocrystalline kaolinite, equilibrium and thermodynamics aspect of adsorption, *Environmental Nanotechnology, Monitoring & Management* 2018, 9: 37-41.
19. Sura Al-Harashsheh, Omar Al-Ayed, Mohammad Amer and Mohammad Matouq. Analysis of Retorted Water Produced from Partial Combustion of Sultani Oil Shale, *Journal of Environmental Protection*, 2017, 8(09), 10-18.
20. Omar S. Al-Ayed, Mohammad W. Amer and M.Matouq. Variable activation energy principle to model oil shale pyrolysis kinetics, *Oil Shale* 2017, 34(2): 181-194.
21. Mohammad W. Amer and Akl M. Awwad. Removal of Zn(II), Cd(II) and Cu(II) Ions from Aqueous Solution by Nano-structured Kaolinite, *Asian Journal of Chemistry* 2017, 29(5): 965-969.
22. Mohammed W. Amer, Rafat Ahmad, Akl M. Awwad. Biosorption of Cu(II), Ni(II), Zn(II) and Pb(II) ions from aqueous solution by *Robinia pseudoacacia* pods powder, *International Journal of Industrial Chemistry* 2015, 6: 67-75.
23. Mohammad W. Amer, Yi Fei, Marc Marshall, W. Roy Jackson, Martin L. Gorbaty, Peter J. Cassidy and Alan L. Chaffee. The structure and reactivity of a low-sulfur lacustrine oil shale (Colorado U.S.A) compared with those of a high-sulfur marine oil shale (Julia Creek, Queensland, Australia), *Fuel Processing Technology* 2015, 135: 91-98.
24. Samer S. Abu-Alrub, Mohammad W. Amer and Saad A. Alkahtani. Adsorption of the Sudan dye (III) in methanol using activated carbon, *Journal of Advances in Chemistry* 2014, 10(10): 3291-3302.

25. Mohammad W. Amer, Yi Fei, Marc Marshall, W. Roy Jackson, Martin L. Gorbaty, Peter J. Cassidy and Alan L. Chaffee. A comparison of the structure and reactivity of five Jordanian oil shales from different locations, *Fuel* 2014, 119: 313-322.
26. Mohammad W. Amer, Blagoj Mitrevski, W. Roy Jackson, Alan L. Chaffee and Philip J. Marriott. Multidimensional and comprehensive two-dimensional gas chromatography of dichloromethane soluble products from a high sulfur Jordanian oil shale, *Talanta* 2014, 120: 55-63.
27. Blagoj Mitrevski, Mohammad W. Amer, Alan Chaffee, and Philip Marriott. Evaluation of comprehensive two-dimensional gas chromatography with flame photometric detection: potential applications for sulfur speciation in shale oil, *Analytica Chimica Acta* 2013, 803: 174-180.
28. Mohammad W. Amer, Yi Fei, Marc Marshall, W. Roy Jackson, Martin L. Gorbaty, Peter J. Cassidy and Alan L. Chaffee. Comparison of the yields and structure of fuels derived from freshwater algae (torbanite) and marine algae (El-Lajjun oil shale). *Fuel* 2013; 105: 83-89.
29. Yi Fei, Marc Marshall, W. Roy Jackson, Martin L. Gorbaty, Mohammad W. Amer, Peter J. Cassidy and Alan L. Chaffee. Evaluation of several methods of extraction of oil from a Jordanian oil shale, *Fuel* 2012; 92(1), 281-287.
30. Mohammad Al-Ghouti, Yahya Salim AL-Deges and Mohammad Amer. Application of chemometrics and FTIR for determination of viscosity index and base number of motor oils. *Talanta*, 2010, 81(3), 1096-1101.
31. Mohammad W. Amer, Fawwaz I. Khalili and Akl M. Awwad. Adsorption of Lead, Zinc, and Cadmium ions on Polyphosphate-modified Kaolinite clay. *Journal of Environmental Chemistry and Ecotoxicology*, 2010, 2(1), 001-008.
32. Mohammad A. Al-Ghouti, Yahya S. AL-Deges and Mohammad Amer. Determination of motor gasoline adulteration using FTIR spectroscopy and multivariate calibration. *Talanta*, 2008, 76(5), 1105-1112.

*International Conferences:*

1. Mohammad W. Amer, Akl M. Awwad and Omar S. Al-Ayed. BAU-Second International Oil Shale Conference, Al-Balqa Applied University, Jordan: 9-11th October 2018.
2. Mohammad W. Amer, Akl M. Awwad and Omar S. Al-Ayed. 3rd Jordanian International Oil Shale Symposium, Dead Sea, Jordan: 21-22nd November 2016.
3. Mohammad W. Amer, Akl M. Awwad and Omar S. Al-Ayed. 1st International Conference on Bioresource Technology for Bioenergy, Bioproducts & Environmental Sustainability, Sitges, Spain: 23-26 October 2016.
4. Mohammad W. Amer, Akl M. Awwad and Omar S. Al-Ayed. International Oil Shale Symposium, Tallinn, Estonia, 20-23 September 2016.
5. The Seventh Jordanian International Conference of Chemistry. Irbid, Jordan, 19-21 April, 2016.
6. Mohammad W. Amer, Yi Fei, Marc Marshall, W. Roy Jackson and Alan L. Chaffee. In: Proceedings of 34th Oil Shale Symposium, Golden, USA, 13-15 October 2014.
7. Mohammad W. Amer, Yi Fei, Marc Marshall, W. Roy Jackson and Alan L. Chaffee. 2nd Jordanian International Oil Shale Symposium, Dead Sea, Jordan: 14-15th April 2014.
8. Mohammad W. Amer, Blagoj Mitrevski, W. Roy. Jackson, Alan L. Chaffee and Philip Marriott. In: Proceedings of 33rd Oil Shale Symposium, Golden, USA, 14-16 October 2013.
9. Blagoj Mitrevski, Mohammad W. Amer, Alan L. Chaffee, Philip J. Marriott. In: Proceedings of the 20th RACI R&D topics conference in analytical and environmental chemistry, Deakin University, Geelong Australia 11-14 December 2012.

10. Mohammad W. Amer, Alan L. Chaffee, Yi Fei, Marshall M and W. Roy Jackson. Preprints - American Chemical Society, Division of Energy & Fuels (2012), 57(2), 32-33.
11. Mohammad W. Amer, W. Roy Jackson, Yi Fei, Marc Marshall, Martin L. Gorbaty, Peter J. Cassidy and Alan L. Chaffee. In: Proceedings of Jordan International Oil Shale Symposium, Dead Sea, Jordan: 7-9th May 2012.
12. Mohammad W. Amer, W. Roy Jackson, Yi Fei, Marc Marshall, Martin L. Gorbaty, Peter J. Cassidy and Alan L. Chaffee. In: Proceedings of 3rd Asia-Oceania Conference on Green & Sustainable Chemistry, Melbourne, Australia: 4-7 December 2011.
13. Mohammad W. Amer, W. Roy. Jackson, Marc Marshall, Philip Marriott, Blagoj Mitrevski and Alan L. Chaffee. In: Proceedings of Asia Pacific International Symposium on Microscale Separations and Analysis. Hobart, Australia: 27-30 November 2011.
14. W. Roy Jackson, Alan L. Chaffee, Marc Marshall, Yi Fei, Mohammad W. Amer and Peter J. Cassidy. In: Proceedings of 31st Oil Shale Symposium, Golden, USA, 17-21 October 2011.
15. W. Roy Jackson, Mohammad W. Amer, Yi Fei, Marc Marshall and Alan L. Chaffee. In: Proceedings of the International Conference in Coal Science and Technology, Oviedo, Spain: 9-13 October 2011.
16. Peter J. Redlich, Mohammad W. Amer, Alan L. Chaffee, Marc Marshall, W. Roy. Jackson, Frank P. Larkins, and Peter J. Cassidy. Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry (2011), 56(2), 342-343.
17. Mohammad Al-Ghouti and Mohammad Amer, Regular and Super Gasoline Adulteration: Distillation and FTIR Studies. The 14th Arab Chemistry Conference & Exhibition (ACC-14) Tripoli-Libya 31 March – 4 April 2008.

## **References**

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