

Ali Khalaf Al-Matar

**Chemical Engineering Department,
School of Engineering,
University of Jordan
Amman 11942, Jordan**

Phone: +962- 777- 182 089

E-mail: aalmatar@ju.edu.jo or aalmatar@yahoo.com

Areas of Expertise

- Statistical thermodynamics with emphasis upon Monte Carlo simulations of phase equilibria and virial coefficients.
- Development of new thermodynamic models of mixing rules for use in molecular simulation computer experiments, equations of state with particular emphasis on applications to supercritical fluid extraction, vapor-liquid and liquid-liquid equilibria.
- Conversion of CO₂ to hydrocarbons and catalyst development.
- Process safety engineering and incident investigation.
- Separation processes with emphasis upon solvent extraction applied to hydrometallurgy in general and uranium extraction from phosphoric acid and ores, and purification of phosphoric acid in particular.
- Numerical algorithms and methods applied to chemical engineering science and practice

Education

- B.Sc. in Chemical Engineering, June 1990, University of Jordan, Amman, Jordan.
- M.Sc. in Chemical Engineering, October 1993, University of Jordan, Amman, Jordan.
- Ph.D. in Chemical Engineering, May 2002, New Mexico State University, Las Cruces, New Mexico, USA

Work Experience

1. Associate professor at the chemical engineering department of the University of Jordan (2015-present).
2. Visiting associate professor, Department of Chemical Engineering, King Fahd University of petroleum and Minerals, Saudi Arabia (2013-2015)
3. Associate professor at the chemical engineering department of the University of Jordan (2012-2013).
4. Assistant professor at the chemical engineering department of the University of Jordan (2003-2011).
 - a. Courses taught include:
 - i. **PhD and M.Sc. level courses:** thermodynamics, computer aided design (CAD), environmental impact of energy systems, mass

transfer, and applied engineering statistics for industrial engineering students.

- ii. **B.Sc. level courses:** chemical engineering thermodynamics I and II, chemical process simulation using HYSYS, process modeling by statistical methods, statistical quality control, engineering numerical methods, physical chemistry, process plant commissioning, chemical engineering lab I (fluid mechanics and thermodynamics), chemical engineering lab II (heat transfer and particulate solids), and chemical engineering lab III (mass and combined heat and mass transfer), public safety (University elective), Jordanian Industries (University elective), Fuel and Energy (Department elective), Management for Chemical Engineers (Department elective).
- b. Supervising many undergraduate graduation projects. Some of which won the JEA best project award in the field of chemical engineering. Also, some nominated for Ministry of Higher Education and Scientific Research distinguished student award.
- c. Serving on many graduate defense committees as well as supervising one Ph.D. level dissertation and many M.Sc. thesis
 - i. **Co-advisor** with Prof. Mahmoud Hammad, **Ph.D. dissertation (2009)**. Ihab Bani Hani, Modeling and simulation of energy production processes from the incineration of polychlorinated biphenyl wasted in rotary kilns, mechanical engineering department, University of Jordan.
 - ii. **Co-advisor** with Dr. Ahmed Tobgy, **M.Sc. thesis (2007)**. Ibrahim Ata Suleiman, Vapor-liquid phase diagram of Lennard-Jones fluid using temperature dependent interaction parameters, chemical engineering department, University of Jordan.
 - iii. **Co-advisor** with Dr. Ahmed Tobgy, **M.Sc. thesis (2011)**. Haneen B. Jildeh, Adsorption of cadmium onto Jordanian zeolites, chemical engineering department, University of Jordan.
 - iv. **Co-advisor** with Dr. Ahmed Tobgy, **M.Sc. thesis (2011)**. Majdi Adel Al-Fayyad, Self diffusion coefficient of Lennard-Jones fluid using temperature dependent interaction parameters, chemical engineering department, University of Jordan.
 - v. **Co-advisor** with Dr. Ahmed Tobgy, **M.Sc. thesis (2011)**. Basel Abdel-Raziq, Thermodynamics of supercritical fluid extraction of solid solutes using the weighting matrix approach, chemical engineering department, University of Jordan.
 - vi. **Advisor, M.Sc. thesis (2012)**. Shuruq Y. Shawish, Influence of cosolvents on solid solutes in supercritical carbon dioxide.
 - vii. **Advisor, M.Sc. thesis, Mohammad Al-Bayyat**, Producing clean fuels diesel in the Ras Tanurah Refinery, oil and gas surface facilities program (**OGSF**).
 - viii. **Advisor for two M.Sc. students (2013-2015)**, Catalytic and Photocatalytic conversion of CO₂ to hydrocarbons, **KFUPM**.

- d. Involved in funded research projects as well as other research projects. The total funding in excess of one million US\$.
 - i. **PI:** Purification of H_3PO_4 to food/pharmaceutical grade. Funded by Deanship of Academic Research, JU with a funding of US\$ 21,000.
 - ii. **PI:** VLE Phase diagram of UF_6 using TDIP. Funded by Deanship of Academic Research, KFUPM with a funding of US\$ 25,000.
 - iii. **PI:** purification of Saudi H_3PO_4 from cadmium using novel nanomaterials. Funded by Deanship of Academic Research, KFUPM with a funding of US\$ 100,000.
 - iv. **CoI:** Electrocatalytic conversion of CO_2 to formic acid. Funded by KACST, Saudi Arabia with a funding of US\$ 600,000.
 - v. **CoI:** Enhanced oil recovery using surfactant-polymer systems. Funded by Saudi ARAMCO, Saudi Arabia with a funding of \$500,000.
- e. Coordinator on the Jordanian part for a JEP-TEMPUS project.
- f. Assistant Dean for students' affairs (2008-2009).
- g. Director of Training in the Center for Consultation – University of Jordan (2011-2012).
- h. Delivered many courses for industry and academia: “Process plant commissioning, troubleshooting, and startup”, “Process engineering fundamentals”, “Statistical quality control”, “Process Safety”, “Preventing Human Errors”, “Process Industries Project Management”, “Statistics in the Lab”, and “Handling Hazardous Materials”. List of clients include Aramco (KSA), SABIC (KSA), Gasco (UAE), ZADCO-ADNOC (UAE), KNPC (Kuwait), KJO (KSA and Kuwait), Wintershall (Libya), ADSSC (UAE), TASNEE (KSA), Arab Potash Company (Jordan), Advanced Petrochemical Company (KSA), Gulf Chemical and Industrial Oil Co., Natpet (National Petrochemical Industrial Co., KSA).
5. Teaching and Research Assistant (August 1997-2002). Chemical Engineering Department, New Mexico State University, Las Cruces, NM.
 - a. Job responsibilities included teaching and grading basic calculations in chemical engineering, chemical engineering thermodynamics, chemical engineering kinetics, fluid mechanics, computer programming, and fundamentals of heat and mass transfer.
6. Researcher (1995-1997). Industrial Chemistry Center (ICC), Royal Scientific Society (RSS), Amman, Jordan.
 - a. Designing and evaluating the performance of a pilot plant for the treatment of the waste by-product of phosphoric acid manufacturing (phosphogypsum) to building grade plaster of Paris.
 - b. Technical services in the area of paint and surface coatings.
 - c. Minor work responsibilities dealing with the implementation of ISO 9000.
7. Part time lecturer (Spring 1995). Chemical Engineering Department, University of Jordan, Amman, Jordan.
 - a. Instructing and grading the heat and mass transfer laboratory for senior students.
8. Teacher (1993-1994). Jubilee School for Gifted Students, Amman, Jordan.

- a. Teaching chemistry for ninth grade gifted students
9. Internship (Summer 1989). Royal Scientific Society, Amman, Jordan.
10. Internship (Summer 1988). Jordan Petroleum Refinery Company, Zarqa, Jordan.

Computer Skills

- Excellent knowledge and use of different computer platforms including UNIX and Windows operating systems.
- Excellent programming capabilities using Matlab, ISO implementation of FORTRAN, especially the new standards: Fortran 90/95/2000. Excellent programming capabilities using Matlab. In addition of to a fair knowledge of different other languages: BASIC, C, and Pascal.
- Good knowledge in building Graphical User Interfaces (GUI) under windows using Delphi and Visual Basic and their implementation for scientific applications
- Web design capabilities using HTML and FrontPage.
- Excellent knowledge in using HYSYS and fair knowledge in using ASPEN PLUS process simulators.

Publications

Dissertation and Theses

1. **Ali Al-Matar**, "Extraction of uranium from purified wet process Jordanian phosphoric acid: A study of system properties and performance of a pulsed sieve plate extraction column," Master's thesis, University of Jordan, 1993.
2. **Ali Al-Matar**, "A Generating equation for mixing rules and assessment of their effect on the second virial coefficient," Doctoral dissertation, New Mexico State University, May 2002.

Referred Publications

1. **Ali Al-Matar**, and Rawajfeh Khaled, "A study of the extraction equilibrium in the system: phosphoric acid produced in Aqaba-Uranium-0.5M DEPA-0.125M TOPO diluted in kerosene," *Dirasat*, 22B (6):1459-1474, 1995.
2. Rawajfeh Khaled, and **Ali Al-Matar**, "A generalized equation for calculation of fractional recoveries and presentation of data for solvent extraction systems," *Dirasat*, 27(1):1-9, April 2000 (Muharram 1421 Hijri).
3. **Ali Al-Matar**, and Rawajfeh Khaled, "Uranium extraction from purified wet process Jordanian phosphoric acid: A development study," *Hydrometallurgy*, 56:309-322, July 2000.
4. **Ali Al-Matar**, and David Rockstraw, "A Generating equation for mixing rules and two new mixing rules for the interatomic potential energy parameters," *Journal of computational chemistry*, Vol. 25(5):660-668, 15 April 2004.
5. **Ali Al-Matar**, and David Rockstraw, "Assessment of the effect of mixing rules on the second virial coefficient," *Dirasat: engineering sciences*, Vol. 33(1): 27-36, April 2006.
6. **Ali Al-Matar**, Ahmed Tobgy, and Ibrahim Suleiman, "The phase diagram of the Lennard-Jones fluid using temperature dependent interaction parameters", *Journal of Molecular Simulation*, Vol. 34, No. 3, March 2008, 289-294.

7. **Ali Al-Matar**, Bassam Eleswed, and Maha Tutonji, "Kinetics of omeprazole degradation in the presence of 2-mercaptoethanol", *International Journal of Chemical Kinetics*, Volume 40, Issue 6, Pages 352-358, June 2008.
8. **Ali Al-Matar**, Bassam Eleswed, and Maha Tutonji, "Kinetics of acid degradation of proton pump inhibitors in the presence of thiol", *International Journal of Chemical Kinetics*, Volume 41, Issue 7, Pages 498-506, July 2009.
9. **Al-Matar, Ali** and Sweis, Fawaz K. (2010) "Thermodynamics of Supercritical Fluid Extraction of Some Dyes and Pharmaceutical Compounds Using the Weighting Matrix Approach," *Chemical Product and Process Modeling: Vol. 5 : Iss. 1, Article 26*.
10. Zayed Al-Hamamre, **Ali Al-Mater**, Fawaz Sweis, Khaled Rawajfeh (2014), Assessment of the status and outlook of biomass energy in Jordan, *Energy Conversion and Management*, Vol. 77: 183-192.
11. **Al-Matar**, Ali, AH Tobgy, IA Suleiman, MA Al-Faiad (2015), Improving Monte-Carlo and Molecular Dynamics Simulation Outcomes Using Temperature-Dependent Interaction Parameters: The Case of Pure LJ Fluid, *International Journal of Computational Methods*, Vol. 12, Issue 2, Pages 1550003-1:14.
12. **Ali Kh. Al-Matar**, Ahmed H. Tobgy, , Ibrahim A. Suleiman, Majdi A. Al-Faiad, "Improving Monte Carlo and Molecular Dynamics Simulation Outcomes Using Temperature Dependent Interaction Parameters", presented at the 18th symposium on thermophysical properties, Boulder, Colorado, USA, 24—29/6/2012.
13. Muhammad Shahzad Kamal, **Ali kh Al-Matar**, Abdullah Sultan, Ibnelwaleed Ali Hussein, "Predicting Interfacial Tension Using Advanced Meso-Scale Modelling Technique", *SPE Enhanced Oil Recovery Conference*, Kuala Lumpur, Malaysia, 11-13 August 2015.
14. Bani-Hani, E. H., M. Hammad, **A. Matar**, A. Sedaghat, and K. Khanafer. "Analysis of Polychlorinated Biphenyl Wastes Incineration in Rotary Kilns, Part I: Model Development and Validation." *Int J Mech Syst Eng* 1, no. 103 (2015): 2.
15. Ahmad, Waqar, **Ali Al-Matar**, Reyad Shawabkeh, and Adeem Rana. "An experimental and thermodynamic study for conversion of CO₂ to CO and methane over Cu-K/Al₂O₃." *Journal of Environmental Chemical Engineering* 3, no. 4 (2016): 2725-2735.
16. **Al-Matar, Ali Khalaf**, and Housam Binous. "Vapor–liquid phase equilibrium diagram for uranium hexafluoride (UF₆) using simplified temperature dependent intermolecular potential parameters (TDIP)." *Journal of Radioanalytical and Nuclear Chemistry* 310, no. 1 (2016): 139-154.
17. Hadidi, Laith A., Adel S. AlDosary, **Ali K. Al-Matar**, and Omar A. Mudallah. "An optimization model to improve gas emission mitigation in oil refineries." *Journal of Cleaner Production* 118 (2016): 29-36.
18. Bani-Hani, Ehab Hussein, Mahmoud Hammad, **Ali Matar**, Ahmad Sedaghat, and Khalil Khanafer. "Numerical analysis of the incineration of polychlorinated biphenyl wastes in rotary kilns." *Journal of Environmental Chemical Engineering* 4, no. 1 (2016): 624-632.
19. Rana, Adeem Ghaffar, Waqar Ahmad, **Ali Al-Matar**, Reyad Shawabkeh, and Zaheer Aslam. "Synthesis and characterization of Cu–Zn/TiO₂ for the

- photocatalytic conversion of CO₂ to methane." Environmental technology 38, no. 9 (2017): 1085-1092.
20. **Ali K. Al-matar**, and Housam Binous; Applications of Particle Swarm Optimization to Chemical Engineering Problems, Advances in Engineering Research, 19-38, 2017, Nova Science Publishers, New York.

Conferences, seminars, workshops, and continuing education

1. Molecular simulation Spring School CCP5, Bristol, UK, 1998.
2. **Ali Al-Matar**, Jennifer Alwin, and David Rockstraw, "Enhanced Pyrite Destruction and Copper Recovery with Fe (VI)," Waste Management 99 Proceedings, Tucson, Arizona, February 28 - March 4, 1999.
3. **Ali Al-Matar**, and David Rockstraw, "A Generating equation for mixing rules and two new mixing rules for the noble gases," Poster presentation, AIChE annual meeting, Reno, Nevada, November 7, 2001.
4. TEMPUS project JEP-30092-2002: evaluation of quality in higher education-MEDA region
 - a. Launching conference, 19-21/1/2004, Paris, France.
 - b. Assessment of the internal evaluation reports, 5-7/9/2004, Amman, Jordan.
 - c. Outcomes and future perspectives, 23-24/4/2005, Cairo, Egypt.
5. Training human resources for quality assurance review in the academic departments workshop, University of Jordan in cooperation with Ministry of Planning 19-23/9/2004, Amman, Jordan.
6. **Ali Al-Matar**, "The weighting matrix approach as a replacement for the binary interaction parameters in equations of state", Thermo International 2006: Sixteenth symposium on thermophysical properties, July 30 - August 4, 2006, Boulder, Colorado, USA.
7. Training of trainers' workshop: Cleaner Production. Royal Scientific Society 10-13/9/2006, Amman, Jordan.
8. ABET criteria EC2000 workshop, Faculty of Engineering and Technology, University of Jordan, 13-14/6/2007.
9. Assessment process on ABET EC2000 workshop, Faculty of Engineering and Technology, University of Jordan, 24-25/6/2007.
10. **Ali Al-Matar**, Ahmed Tobgy, and Ibrahim Suleiman, "Improved prediction of the phase diagram of simple fluids using temperature dependent interaction parameters", *First International Chemical Engineering Conference*, University of Al-Baath, Homs, Syria, 9-12 February 2009.
11. **Ali Al-Matar**, "Thermodynamics of supercritical fluid extraction of some dyes and pharmaceutical compounds using the weighting matrix approach", *First International Chemical Engineering Conference*, University of Al-Baath, Homs, Syria, 9-12 February 2009.
12. **Head of the Jordanian delegation: "Nuclear energy policy development and planning"**, South Korea, 10/7 to 1/8/2010. Held by the Korean International cooperation Agency (KOICA) and Korean Atomic Energy Research Institute (KAERI) .

13. **Ali Al-Matar**, Ahmed Tobgy, and Majdi Adel, “Self diffusion coefficient of the Lennard-Jones fluid using temperature dependent interaction parameters”, Second international Chemical Engineering Conference, University of Jordan, Amman, Jordan, October 2010, 11 - 13.
14. **Ali Al-Matar**, Ahmed Tobgy, and Hanin Jildeh, “Adsorption of cadmium using Jordanian zeolite”, Second international Chemical Engineering Conference, University of Jordan, Amman, Jordan, October 2010, 11 - 13.
15. Fawaz K. Sweis, **Ali Al-Matar**, and Zayed Hamamreh, “Regulating the safety issue at the University of Jordan”, Second international Chemical Engineering Conference, University of Jordan, Amman, Jordan, October 2010, 11 - 13.
16. **Ali Al-Matar**, Ahmed Tobgy, and Majdi Adel, “Self diffusion coefficient of the Lennard-Jones fluid using temperature dependent interaction parameters: the effect of pressure”, Sixth international Chemical Engineering Conference, Holiday Inn, Amman, Jordan, March 2012, 12-14.
17. **Ali Al-Matar**, and Shuruq Y. Shawish, “Influence of cosolvents on cholesterol solubility in supercritical carbon dioxide”. Sixth international Chemical Engineering Conference, Holiday Inn, Amman, Jordan, March 2012, 12-14.
18. **Ali Kh. Al-Matar**, Ahmed H. Tobgy, , Ibrahim A. Suleiman, Majdi A. Al-Faiad, “Improving Monte Carlo and Molecular Dynamics Simulation Outcomes Using Temperature Dependent Interaction Parameters”, presented at the 18th symposium on thermophysical properties, Boulder, Colorado, USA, 24—29/6/2012.
19. Reyad Shawabkeh, **Ali Al-Matar**, Waqar Ahmed, Adeem Rana, “Synthesis of a new Cu-based catalyst for CO₂ capture and conversion to hydrocarbons”, CPM-7 The 7th International Workshop on Characterization of Porous Materials: From Angstrom to Millimeters, Delray Beach, Florida, USA, 3-6/5/2015.
20. Muhammad Shahzad Kamal, **Ali kh Al-Matar**, Abdullah Sultan, Ibelwaleed Ali Hussein, "Predicting Interfacial Tension Using Advanced Meso-Scale Modelling Technique", SPE Enhanced Oil Recovery Conference, Kuala Lumpur, Malaysia, 11-13 August 2015.
21. **Ali K. Al-Matar**, and Housam Binous; Vapor–Liquid Phase Equilibrium Diagram for Uranium Hexafluoride (UF₆) Using Simplified Temperature Dependent Intermolecular Potential Parameters (TDIP), AIChE annual meeting, Minneapolis, USA, October 29 - November 3, 2017.
22. **Ali K. Al-matar**; Status of the Vapor-Liquid Equilibria Prediction using Temperature Dependent Interaction Parameters, presented at the 20th symposium on thermophysical properties, Boulder, Colorado, USA, 24—29/6/2018.
23. Development of Chemical Safety and Security Confidence Building Measures for the Middle East Region, Amman-Warsaw seminar organized by Jordan Armed Forces, DTRA and ICCSS, 9-11 April, 2019.

Reviewer for Scientific Publications

1. Journal of Molecular Liquids (Elsevier).
2. Arab Journal for Science and Engineering (King Fahd University of Petroleum and Minerals – KSA).
3. Journal of Chemical and Engineering Data (American Chemical Society, USA).
4. Mutah Journal of Research (University of Mutah, Jordan).

5. Journal of Cleaner Production (Elsevier).
6. Journal of Computer Applications in Engineering Education (Wiley).
7. Reviewer for the Higher Council for Science and Technology (HCST), Jordan.
8. Reviewer for the Second international Chemical Engineering Conference, University of Jordan, Amman, Jordan, October 2010, 11 - 13.
9. Journal of sustainable energy development (Elsevier).
10. Reviewer for the Scientific Research Fund, Ministry of Higher Education and Scientific Research, Jordan.
11. Reviewer for the Sixth international Chemical Engineering Conference, Holiday Inn, Amman, Jordan, March 2012, 12-14.

Honors, Rewards, and Leadership Skills

- **Voted as the “Distinguished Professor in the Chemical Engineering Department”** for the academic year 2011/2012
- **Representative of the Faculty of Engineering and Technology**, University Council, University of Jordan, 2010-2011.
- **First place for best oral presentation.** Graduate research and arts symposium (GRAS). New Mexico State University, Las Cruces, April 2002.
- **President of the Chemical Engineering Graduate student organization**, 2000-2001, New Mexico State University.
- **Member of the team that won the best innovative process design for Task I (Recovery of acid mine tailings)**, WERC International Design Contest, April 1998, Las Cruces, NM.

Languages

- Arabic (native)
- English (excellent)
- Spanish (minor)

References are available upon request.