MALYUBA A. ABU-DAABES, PH.D.

German Jordanian University
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PERSONAL INFORMATION

D.O.B: September 20th, 1975
Nationality: Jordanian
Gender: Female
Marital Status: Married with 3 children

HIGHLIGHTS

- Ph.D. in Chemical Engineering with 16 years of teaching and research experience in Kuwait, Jordan, and USA.
- Experienced in architecture of advanced nano-structured materials for separation applications including water, wastewater and air pollution control.
- Skilled in Thermo-gravimetric analysis (TGA), Electron microscopy (SEM), FTIR, elemental analysis, Cold-Vapor Atomic Absorption (CVAA), UV-spectroscopy techniques and ICP.
- Skilled in building up experimental lab-scale setups for testing water desalination performance, and heavy metals adsorption from both liquid and gas phases.
- Acquired over USD 145,000 research grants locally and internationally.
- Leadership, problem solving, administrative, organizational, interpersonal, multi-tasking, strategic planning, needs assessment, staff training, supervision and mentoring and oral/written communication skills.

EDUCATION

1999-2005 **Ph.D. Chemical Engineering** (combined MSc and PhD)
University of Cincinnati, Cincinnati–Ohio, USA **GPA: 3.90/4**

Note: This is a combined MSc and PhD degree with a total of 135 credit hours: 45 credit hours of MSc courses + 90 credit hours of courses and research work.

Dissertation title: "Synthesis and Characterization of Nano-Structured Chelating Adsorbents for the Direct Removal of Mercury Vapor from Flue-Gases".
Advisor: Professor Neville G. Pinto.

1993-1998 **B.Sc., Chemical Engineering**, University of Jordan, Amman, Jordan. **GPA: 3.47/4**

CORE RESEARCH COMPETENCIES

1. ***Architecture of advanced nano-structured materials for separation applications***
Including: development of novel chelate-based sorbent technology for the control of air toxics such as, mercury from flue gases. Synthesis of adsorbents with high specificity and process stability. A patent for this novel technology has been filed with the University of Cincinnati.

2. ***Trace metal speciation in air pollution,***
Including: speciation of oxidized and elemental mercury in the gas phase.

3. ***Adsorption fundamentals and separation,*** including:
   - Isotherm modeling on heterogeneous adsorbents.
   - Mechanisms of liquid aromatic adsorption on activated carbon.
   - Gas contactor design and process evaluation.

4. ***Ceramic membranes for water desalination***

Development of composite multi-layered inorganic membranes for use in water desalination with focus on natural clay resources. Membrane support and multilayers are prepared by various techniques including pressing/sintering, sol-gel dip and spin coating techniques.

5. ***Characterization techniques,***

Including: surface and porosity characterization (N_2 porosimetry), Thermo-gravimetric analysis (TGA), Electron microscopy (SEM), FTIR, elemental analysis, Cold-Vapor Atomic Absorption (CVAA), UV-spectroscopy, as well as building lab-scale units for testing gas permeation, and water desalination performance.

ACADEMIC AND PROFESSIONAL WORK HISTORY

APPOINTMENTS

- **German Jordanian University (Amman, Jordan) Sept. 2005 – Present**
  (The German Jordanian University is a public university established in 2005)
  - **Dean** Apr. 2012 - June 2016
    School of Applied Medical Sciences
    Responsibilities:
    Responsible for two departments: Biomedical Engineering and Pharmaceutical and Chemical Engineering. Coordinated students, faculty, and school matters. Reviewed curriculum, learning enhancement and accreditation. Established all needed laboratories for the two departments. Performed staff recruitment and hiring process, Evaluated faculty members and staff. Prepare annual school reports. Coordinated partnership with the German partner universities.
  - **Head of Department** Sept. 2009 -Sept. 2011
    the Pharmaceutical and Chemical Engineering Department
    Responsibilities:
    Coordinated students, faculty, and department matters. Reviewed curriculum, learning enhancement and accreditation. Established all needed laboratories for the department. Performed staff requirement and hiring process, Evaluated faculty members and staff. Prepare annual department reports.
  - **Establishing Dean** Feb. 2006 - Feb. 2008
    School of Applied Medical Sciences
    Responsibilities:
    Responsible for two departments: Biomedical Engineering and Pharmaceutical and Chemical Engineering. Coordinated students, faculty, and school matters. Reviewed curriculum, learning enhancement and accreditation. Established needed laboratories for the two departments in the temporary campus of the university. Performed staff requirement and hiring process, Evaluated faculty members and staff. Prepare annual school reports. Established and coordinated partnership with the German partner universities.
  - **Associate professor** Mar. 2014 - Now
    Pharmaceutical and Chemical Engineering Department
    Responsibilities:
    Lectured undergraduate students, preparation of the undergraduate study plan for the Pharmaceutical and Chemical engineering department, participated in the university course

coordination, participated in tender preparations and analyses.

– **Assistant professor** Sept. 2005 - Mar. 2014
Pharmaceutical and Chemical Engineering Department
Responsibilities:
Lectured undergraduate students, preparation of the undergraduate study plan for the Pharmaceutical and Chemical engineering department, participated in the university course coordination, participated in tender preparations and analyses.

- **Georgia Institute of Technology (Atlanta, GA, USA)** **Nov. 2004 - Sept. 2005**
  – **Postdoctoral Researcher**
  Chemical Engineering Department
  Responsibilities:
  Conducted research on capturing of toxic emissions from wood drying and pressing facilities using boiler ash. Investigated new additives for enhancing paper pulp drainage.

- **University of Cincinnati (Cincinnati, OH, USA)** **Sept 1999 – Nov. 2004**
  – **Graduate Teaching Assistant**
  Chemical Engineering Department
  Responsibilities:
  Mentored undergraduate students on research projects. Taught undergraduate unit operations laboratory courses. Tutored undergraduate students with chemical engineering courses, including: Heat Transfer, Basic Thermodynamics, and Membrane Separation.

- **NUR Chemicals and Eng. Industries (Amman, Jordan)** **June 1998 – Dec. 1998**
  – **Research Assistant**,
  Responsibilities:
  Conducted lab-scale research to develop highly efficient demulsifier to separate water and salt from crude oil.

- **Kavi Kablo Factory (Istanbul, Turkey)** **June 1997 – Aug. 1997**
  – **Visiting Scholar**
  (as part of The International Association for the Exchange of Students for Technical Experience, **IAESTA**).
  Responsibilities:
  Extensive training in the field of electric wire enameling including the production process of electric wires enameling, quality control, and water treatment.

FUNDED RESEARCH PROJECTS

Treatment and Reuse of Textile Wastewater Effluents using Hybrid Adsorption-Membrane Process Based on Novel Silica Alumina Geopolymers (Co-investigator). Funded by the European Union through the Support to Research and Technological Development and Innovation Initiative and Strategies Project (SRTD II) and University of Jordan. Total fund: 28,875.84 €. Contract number AR-220. Period 01/06/2015 to 30/08/2016. Status: completed.

Sol-Gel Synthesis of Water Desalination Inorganic Membranes from Natural Clays (Principal Investigator). Funded by The Scientific Research Support Fund, Ministry of Higher Education/ Jordan. Total fund: 72,815 JD ($102,000). Contract number E/1/11/2010. Period 5/2011 – 5/2013. Status: completed.

Removal of Heavy Metals and Phenolic Compounds from Municipal Solid Waste Landfill Leachates in Jordan (Principal Investigator). Funded by the German-Jordanian University and European Union through the Support to Research and Technological Development and Innovation Initiative and Strategies Project (SRTD). Total fund 29,800 JD ($42,000).Contract number: SRTD/2009/RGS5/027. Period 7/2009 – 11/2010. Status: Completed.

PATENT

Degouvea-Pinto N R; **Abu-Daabes M**, High Capacity Materials for Capture of Metal Vapors from Gas Streams**, US Patent number US8118916 B2**, Feb. 21, 2012

RESEARCH PUBLICATIONS

1. Qaroush, A.K., Saleh, M.I, Alsyouri, H.M., **Abu-Daabes, M.A.**, Eftaiha, A.F., Assaf, K.I., Abu-Zaid, R., Abu-Surrah, A.S., Troll, C., Rieger, B., (2022). In situ activation of green sorbents for CO2 capture upon end group backbiting. *Phys. Chem. Chem. Phys.*, 24, 12293-12299. https://doi.org/10.1039/D2CP00837H
2. Eftaiha, A.F., Qaroush, A.K., **Abu-Daabes, M.A.**, Alsyouri, H.M., Assaf, K.I., (2020). CO2 Sorbents: New Metrics of Green Sorbents for CO2 Capturing. *Adv. Sustainable Syst*, 4, 1900121. https://doi.org/10.1002/adsu.202070013.
3. Qaroush, A. K., Castillo-Molina, D. A., Troll, C., **Abu-Daabes, M. A.,** Alsyouri, H. M., Abu-Surrah, A. S., and Rieger, B., (2015) [n]-Oligourea-Based Green Sorbents with Enhanced CO2 Sorption Capacity. *ChemSusChem*, 8, p 1618 –1626. DOI:10.1002/cssc.201402828.
4. Alsyouri, H.M., **Abu-Daabes, M.A.,** Alassali, A., and Lin, YS., (2013). Ordered mesoporous silica prepared by quiescent interfacial growth method - effects of reaction chemistry, *Nanoscale Res. Lett.*, **8**, p 484. http://www.nanoscalereslett.com/content/8/1/484
5. **Abu-Daabes, M.A.,** H. Abu-Qdais, and H. Alsyouri, (2013). Assessment of Heavy Metals and Organics in Municipal Solid Waste Leachates from Landfills with Different Ages in Jordan, *J. Environ. Prot.*, **4**, p 344-352.
6. Hindiyeh, M.Y., **Abu-Daabes, M.,** Salti, H.E., (2012). Corporate Environmental Responsibility in Jordan. In Editor: Jamali, D., Sidani, Y., *CSR in the Middle East, Fresh Perspectives.* UK: Palgrave Macmillan. 114-135.
7. Ji, L., **Abu-Daabes, M.**, Pinto, N.G., (2009). Thermally robust chelating adsorbents for the capture of gaseous mercury: Fixed-bed behavior., *Chem. Eng. Sci.*, **64**, p 486-491.
8. **Abu-Daabes, M.,** Awwad, A., Al-Ani, H., (2009). Densities and volumetric properties of (N-acetylmorpholine + aromatic hydrocarbon) binary mixtures from T = (293.15 K to 343.15) K, *J. Chem. Thermodyn.*, **41**, p 123-129.
9. **Abu-Daabes, M.,** Awwad, A., (2008). Volumetric and Viscometeric Properties of Aqueous Solutions of N-(2-hydroxyethyl)morpholine at T=(293.15, 303.15, 313.15, 323.15, 333.15) K, *J. Chem. Thermodyn.*, **40**, p 874–878.
10. Awwad, A., **Abu-Daabes, M.,** (2008). Densities, Viscosities and Excess Properties of N-Methylmorpholine + Cyclohexane, + Benzene, and + Toluene at (298.15, 303.15, 313.15, 323.15) K, *J. Chem. Thermodyn.*, **40**, p 645–652.
11. Awwad, A., Alsyouri, H., **Abu-Daabes, M.**, and Jbara, K., (2008). Densities and Volumetric Properties of N-(2-Hydroxyethyl)morphline + Ethanol, + 1-Propanol, + 2-Propanol, + 1-Butanol, and + 2-Butanol at (293.15, 298.15, 303.15, 313.15, 323.15) K, *J. Chem. Thermodyn.*, **40**, p 592–598.
12. Hartong, B.H, **Abu-Daabes, M.,** Le, T., Saidan, M., Banerjee, S., (2007). Sludge Dewatering with Cyclodextrins, *Water Research*, **41,** p1201 – 1206.
13. Banerjee, S., Pendyala, K., Buchanan, M., Yang, R., **Abu-Daabes, M.**, (2006). Process-Based Control of HAPs Emissions from Drying Wood Flakes, *Environ. Sci. Technol.*, **40**, p 2438 -2441.

14. Cowan, J., **Abu-Daabes, M.**, Banerjee, S., (2005). Controlling Formaldehyde Emissions with Boiler Ash. *Env. Sci. Technol.*, **39**, p 5101-5104.
15. **Abu-Daabes, M.**, Pinto, N.G., (2005). Synthesis and Characterization of a Nano-structured Sorbent for the Direct Removal of Mercury Vapor from Flue Gases by Chelation. *Chem. Eng. Sci.*, **60**, p 1901-1910.
16. **Abu-Daabes, M.**, Pinto, N.G., (2004). Effect of Surface Oxygen Complexes of Activated Carbon on Phenol Adsorption from Single and Mixed Non-Aqueous Solvents. *Separ. Sci. Technol.*, **39**, p. 2997.
17. **Abu Daabes, M.**, Pinto, N.G., (2002). Preliminary Results of an Investigation on the Feasibility of a Novel Chelating Adsorbent for the Control of Gaseous Mercury Emissions", Proceedings of the 9th Annual International Pittsburgh Coal Conference. Pittsburgh, PA 2002, Sept 23-27, Paper 24-1.

RESEARCH VISITS AND TRAINING

1. DFG fellowship, Technical University of Munich (TUM), Munich, Germany " CO2 Capture using Task Specific Ionic Liquids and their Oligomers/Polymers". Prof. Bernhard Rieger Group, Jan 31st - Feb. 17th. 2013.
2. DIES-Training: "Proposal Writing for International Research Projects" organized by German Academic Exchange Service "DAAD" in cooperation with experts from German universities.
   - First Part, 9th-14th, November, 2007 in Alexandria, Egypt
   - Second Part, 27th May - 01th June 2008 in Alexandria, Egypt.

PRESENTATIONS

1. **Abu-Daabes, M.A.**, "Adsorption of heavy metals and methylene blue from wastewater onto silica alumina geopolymers", The sixth Arab-American Frontiers of Science, Engineering, and Medicine symposium, Kuwait, Nov. 4th 2018.
2. Alsyouri, H.M., Ghrair, A.M., **Abu-Daabes, M.A.**, "Economic and Robust Macroporous Membranes from Natural Kaolin Clays" AIChE Proceeding, AIChE 2013 Annual Meeting, San Francisco, CA, Nov 3rd-8th 2013. Paper 552f. http://www3.aiche.org/proceedings/ExtendedAbstract.aspx?PaperID=345558
3. **Abu-Daabes, M.A.,** H. Abu-Qdais, and H. Alsyouri, "Competitive Adsorption of Nickel, Manganese, Chromium and Cadmium from Aqueous Solutions by Different Adsorbents", AIChE 2012 annual meeting, Pittsburgh, PA, Oct. 28th – Nov. 2nd 2012. Paper 119d.
4. **Abu-Daabes, M.A.**, and H. Abu-Qdais, "Effect of Landfill Aging and Control on Municipal Leachate Characteristics in Jordan", 36th International Symposium on Environmental Analytical Chemistry, October 5th-9th 2010, Rome, Italy.
5. **Abu Daabes, M.A.**, and N.G. Pinto, "The Chemistry of Mercuric Chloride Reduction in the Flue Gases of Coal Combustion", AIChE 2006 annual meeting, San Francisco, CA, November, 2006. Paper 593b.
6. **Abu-Daabes, M.A,** and N.G. Pinto, "Gas-Phase Chelating Sorbents for the Removal of Mercury from Flue Gases", AIChE 2003 annual meeting, San Francisco, CA, November, 2003. Paper 324a.
7. **Abu-Daabes, M.A,** and N.G. Pinto, "Gas-Phase Chelating Sorbents for the Removal of Mercury from Flue Gases", presented in the Ohio Mercury Forum, Columbus, OH, April, 2003.
8. **Abu Daabes, M.A.**, and N.G. Pinto, "An Investigation of the Feasibility of a Novel Chelating Adsorbent for the Control of Gaseous Mercury Emissions in Flue Gases", presented in the AIChE 2002 annual meeting, Indianapolis, IN, November, 2002.
9. **Abu Daabes, M.A.**, and N.G. Pinto, "The Relationship Between Surface Hydrophilicity and Adsorption Capacity of Activated Carbon in Mixed Solvents", Poster presented in the 12th annual Graduate Symposium at the University of Cincinnati, Cincinnati, USA, September, 2001.

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ACCOMPLISHMENTS AND AWARDS

- Gold Medal, 12th International Invention Fair in the Middle East, Kuwait 16-19 Feb 2020.
- Vice Chairman of the organizing committee for the Sixth Jordan International Chemical Engineering Conference (JIChEC06) organized by Jordan Engineers Association and cosponsored by American Institute of Chemical Engineers (AIChE). March 12-14 2012, Amman, Jordan.
- Vice President of the Chemical Engineering Graduate Student Governance Association (GSGA), (2003-2004).
- University Research Council Summer Fellowship, University of Cincinnati, 2004.
- University Research Council Summer Fellowship, University of Cincinnati, 2003.
- Chemical Engineering Department TA Lab Award, University of Cincinnati, 2003.
- University Graduate Full Tuition Scholarship, University of Cincinnati 1999-2004.
- Research Assistantship, University of Cincinnati 1999-2004.
- Ministry of High Education Scholarship, University of Jordan (1993-1998).
- University of Jordan Honor list (1994-1998).

COURSES TAUGHT

1. General Chemistry and its Lab
2. Fluid Mechanics and its Lab
3. Heat transfer and its lab
4. Engineering Economy
5. Process Control and Optimization (Matlab)
6. Design in Engineering
7. Principles of Chemical Engineering
8. Separation Processes
9. Natural Gas Processing
10. Advanced Process Simulation (ProMax)
11. Material Science and Engineering
12. Thermodynamics I and II

AFFILIATIONS

- American Institute for Chemical Engineers (AIChE).
- Jordanian Engineers Association.

SKILLS

- **Languages**: Arabic (native speaker) and proficiency in the English language (Spoken and Written)
- **Computer:** Matlab, Promax, Fortran, Mathematica, Microsoft Windows, Microsoft Office Suite.

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