

# MALYUBA A. ABU-DAABES

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## **PERSONAL INFORMATION**

D.O.B: September 20<sup>th</sup>, 1975  
Nationality: Jordanian  
Gender: Female

## **EDUCATION**

- 1999-2005      **Ph.D. Chemical Engineering**, University of Cincinnati, USA  
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.

## **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<sub>2</sub> 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.

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## APPOINTMENTS

*April 2012-present* **Dean**, School of Applied Medical Sciences, German-Jordanian University. Amman, Jordan.

*Sep 2009 -Sep 2011* **Head of the Pharmaceutical and Chemical Engineering Department**, German-Jordanian University. Amman, Jordan.

*Feb 2006-Feb 2008* **Establishing Dean**, School of Applied Medical Sciences, German-Jordanian University. Amman, Jordan. **The German-Jordanian University was established in 2005.**

*March 2014-Now* **Associate professor** at the Pharmaceutical and Chemical Engineering Department, German-Jordanian University. Amman, Jordan.

*Sep 2005-March 2014* **Assistant professor** at the Pharmaceutical and Chemical Engineering Department, German-Jordanian University. Amman, Jordan.

### Responsibilities:

Lecturing undergraduate students, preparation of the undergraduate study plan for the chemical and pharmaceutical engineering department, participating in the university course coordination, participating in tender preparations and analyses.

*Nov 2004-Sep 2005* **Postdoctoral Researcher**, Georgia Institute of Technology. Atlanta, GA, USA.

### 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.

*Sep 1999-2004* **Graduate Teaching Assistant**, Chemical Engineering, University of Cincinnati, Cincinnati, Ohio, USA.

### 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.

*Jun 1998-Dec 1998* **Research Assistant**, NUR Chemicals and Eng. Industries, Amman, Jordan

### Responsibilities:

Conducted lab-scale research to develop highly-efficient demulsifier to separate water and salt from Iraqi crude oil.

*Jun 1997-Aug 1997* **Visiting Scholar**, Kavi Kablo Factori, Istanbul, Turkey.

### 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

1. **Development of an Integrated Adsorption-Membrane System Based on Novel Silica-Alumina Geopolymers for Treatment and Recycling of Industrial Waste Water "**. H.M. Alsayouri (P.I). Malyuba Abu-Daabes, Funded by the European Union through the Support to Research and Technological Development and Innovation Initiative and Strategies Project (SRTD II). Budget: Euro 25,000 (~ USD 29,000), Duration: 2015-2016

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2. **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: ongoing.
3. **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., Castillo-Molina, D.A., Troll, C., **Abu-Daabes, M.A.**, Alsyouri, H.M., Abu-Surrah, A.S., Rieger, B., (2015). [n]-Oligourea-Based Green Sorbents with Enhanced CO<sub>2</sub> Sorption Capacity, *ChemSusChem*, **8**, p 1618–1626.
2. Alsyouri, H.M., **Abu-Daabes, M.A.**, Alassali, A., and Lin, Y.S., (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>
3. **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.
4. 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.
5. 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.
6. **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.
7. **Abu-Daabes, M.**, Awwad, A., (2008). Volumetric and Viscometric 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.
8. 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.
9. Awwad, A., Alsyouri, H., **Abu-Daabes, M.**, and Jbara, K., (2008). Densities and Volumetric Properties of N-(2-Hydroxyethyl)morpholine + 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.
10. Hartong, B.H., **Abu-Daabes, M.**, Le, T., Saidan, M., Banerjee, S., (2007). Sludge Dewatering with Cyclodextrins, *Water Research*, **41**, p1201 – 1206.
11. 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.
12. Cowan, J., **Abu-Daabes, M.**, Banerjee, S., (2005). Controlling Formaldehyde Emissions with Boiler Ash. *Env. Sci. Technol.*, **39**, p 5101-5104.

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13. **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.
14. **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.
15. **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 9<sup>th</sup> Annual International Pittsburgh Coal Conference. Pittsburgh, PA 2002, Sept 23-27, Paper 24-1.

## PRESENTATIONS

1. 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 3<sup>rd</sup>-8<sup>th</sup> 2013. Paper 552f.  
<http://www3.aiche.org/proceedings/ExtendedAbstract.aspx?PaperID=345558>
2. **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. 28<sup>th</sup> – Nov. 2<sup>nd</sup> 2012. Paper 119d.
3. **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 5<sup>th</sup>-9<sup>th</sup> 2010, Rome, Italy.
4. **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.
5. **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.
6. **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.
7. **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.
8. **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 12<sup>th</sup> annual Graduate Symposium at the University of Cincinnati, Cincinnati, USA, September, 2001.

## ACCOMPLISHMENTS AND AWARDS

1. 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.
2. Vice President of the Chemical Engineering Graduate Student Governance Association (GSGA), (2003-2004).
3. University Research Council Summer Fellowship, University of Cincinnati, 2004.
4. University Research Council Summer Fellowship, University of Cincinnati, 2003.
5. Chemical Engineering Department TA Lab Award, University of Cincinnati, 2003.
6. University Graduate Full Tuition Scholarship, University of Cincinnati 1999-2004.
7. Research Assistantship, University of Cincinnati 1999-2004.
8. Ministry of High Education Scholarship, University of Jordan (1993-1998).
9. University of Jordan Honor list (1994-1998).

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## 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:** Fortran, Mathematica, Microsoft Windows, Microsoft Office Suite.

## REFERENCES

Available upon request

Updated April. 2015