

KHALID BANI-MELHEM
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□ **Biography:**

Dr. Bani-Melhem graduated from Jordan University of Science and Technology (JUST) with a BEng (Chemical Eng.) and a MEng (Chemical Eng.) in 1995 and 1998, respectively. His MEng research topic was on water desalination using membrane distillation technology. Dr. Bani-Melhem received his Ph.D. (Civil and Environmental Eng.) from Concordia University, Montreal-Canada in 2008. In September 2016, Dr. Bani-Melhem has been assigned to be the chairman of the Water Management and Environment Department at the Hashemite University. Prior to joining Hashemite University in 2012, he has worked at American University in Cairo (AUC) from Feb. 2010 to August 2012 as a Postdoctoral Researcher on a big project funded from King Abdullah University of Science and Technology (KAUST). Upon finalizing his PhD degree, Dr. Bani-Melhem also engaged in a post-doctoral fellow at Concordia University from 2008 to 2010 where he completed his research on his PhD project which was funded by more than 600 000 Canadian dollars from the Natural Sciences and Engineering Research Council of Canada (NSERC). His work from PhD was registered as a patent in 2010 in USA. In 2012, Dr. Bani-Melhem has joined the department of Water management and Environment as assistant professor at the Hashemite University. Dr. Bani-Melhem's research interests are in the general area of physical, chemical and biological processes for water and wastewater treatments, specifically he focuses on membrane processes for water quality control and water reuse. Dr. Bani-Melhem published more than 30 papers in international conferences and refereed international journals. On the industrial scale, Dr. Bani-Melhem has a long and an excellent experience in chemical and environmental engineering fields. He worked as a process engineer and a quality supervisor at Arab Potash Company (APC) for more than 7 years. During his work at APC, he supervised on water treatment unit in the power station and the wastewater treatment plant (WWTP). Also he has excellent supervision on the quality system (ISO 14000 and ISO 9000) in the company. He was the coordinator to build up these two systems at the company. For Building up ISO 14000, He participated to identify all the environmental aspects and their impact assessment on the environment.

□ **Education:**

Institution	Date from – Date to	Degree(s) or Diploma(s) obtained
Concordia University, Montreal, QC, Canada	2003 – 2008	Ph.D. Civil and Environmental Engineering
Jordan University of Science and Technology-Jordan	1995 – 1998	M.S. Chemical Engineering
Jordan University of Science and Technology-Jordan	1990–1995	B.S. Chemical Engineering

□ **PhD. Thesis:**

Development of a Novel Submerged Membrane Electro-Bioreactor for Wastewater Treatment

□ **MSc. Thesis:**

Sensitivity Analysis of Membrane Distillation Processes

□ **Language Skills:**

Language	Reading	Speaking	Writing
Arabic	Mother tongue		
English	Excellent	Excellent	Excellent

□ **Membership of Professional Bodies:**

- European Membrane Society (EMS).
- International Water Association (IWA).
- Jordanian Engineers Association.

□ **Other skills:**

- Expert in GPS-X(Mathematical modelling, simulation, optimization and management of wastewater treatment plants)
- Expert in ModelMaker Software.

□ **Key Qualifications:**

- Extensive experience in environmental and quality management systems (ISO 9000 & ISO 14000).
- Background knowledge of membrane technology for separation and environmental applications, specifically for wastewater treatment and reuse.
- Experience in mathematical modelling and simulation of process data.
- Excellent laboratory experience in the analytical procedures for water and wastewater characterization including the following instruments: Atomic Absorption Analyser, Ultra Violet Spectrophotometer, Hatch Analyser, BOD test, COD test, DO meter, Zeta Potential Meter, Toxicity test, Fecal Coliform Membrane Filtration Test and Particles size distribution analyser.

□ **Research Interests:**

- Water & wastewater treatment and reuse
- Membrane separation technology
- Water Desalination
- Water treatment by electrocoagulation technique
- Quality and Environmental management systems (ISO 9000 and ISO 14000)

□ **Journals Review:**

- Environmental Science and Technology (EST)
- Separation and Purification Technology (SEPPUR)
- Water Desalination and Treatment (DTW)
- Journal of Membrane Science (JMS)
- Environmental Science and Pollution Research
- Environmental Engineering and Science
- Water Research
- Chemical Engineering Journal
- Bioprocess and Biosystems Engineering

□ **Courses Taught:**

- Waste Water Engineering
- Water Desalination
- Water Treatment Processes
- Membrane Separation Processes
- Industrial Wastewater Management
- Principal of Environmental Science
- Planning & Water Resources Management
- Solid and Hazardous Waste Management
- Scientific Research Methodology
- Advanced Environmental Pollution & its Treatment

□ **Patents**

Wastewater Treatment System and Method (Submerged Membrane Electro-Bioreactor System). **2010**. United States Patent Application **20100051542**, (PhD work).

□ **Honors & Awards**

- Teaching Fellow Award, Concordia University-Canada (2006/01 - 2006/04).
- Dean Scholarship, Concordia University-Canada (2002/09 - 2006/08).
- Graduated Scholarship, Jordan University of Science and Technology-Jordan (1995/09- 1997/06).
- Excellence in Education Award, Jordan Univ. of science and technology-Jordan (1993/09 - 1993/12).
- Award of Ministry of Education, Jordan (1991/09 - 1995/06).

□ **Present Position:**

Head of the Department of Water Management and Environment, College of Natural Resources and Environment, The Hashemite University, Al- Zarqa, Jordan

□ **Summary of Years of Working Experience:**

- Four (5) years of professional academic experience as an assistant professor.
- Four (4) years of experience as a postdoctoral fellow.
- One (1) year of professional academic experience as a Lecturer.
- More than six (6) years of industrial experience at Arab Potash Company in different fields of environmental processes engineering including Extensive experience in environmental and quality management systems (ISO 9000 & ISO 14000), Wastewater treatment plant, Solid waste management and Safety occupational

□ **Working experience abroad:**

Position	Country	Date
Postdoc. Researcher , Department of Construction and Architectural Engineering, American University in Cairo (AUC), Cairo-Egypt,	Egypt	February 2010 – Aug 2012
Postdoc. Researcher , Department of Civil and Environmental Engineering, Concordia University, Montreal, QC, Canada	Canada	October 2008 – February 2010

□ **Professional experience:**

Date from – Date to	Location	Company	Position	Description
9/2016-Now	Jordan	College of Natural Resources and Environment, The Hashemite University	Head of the Department of Water Management and Environment	-Prepare the department plan for the given academic year. -Response to the daily department requirements. -lead the department council for improving the academic policies.
9/2012 – Now	Jordan	College of Natural Resources and Environment, The Hashemite University	Assistant Professor	-Teaching graduated and under graduated students. -Conducting an applied research related to water and wastewater treatment and reuse.
1/2010 – 8/2012	Egypt	Department of Construction and Architectural Engineering, American University in Cairo (AUC), Cairo-Egypt,	Post. Doc. Researcher	A principle researcher in a project funded by King Abdullah University of Science and Technology (KAUST) and the Sustainable Wastewater Management (SWM) Group in the Department of Construction and Architectural Engineering at The American University in Cairo. The main objective was to design a small membrane device which could be used for treating and reuse of grey water in arid and semi-arid areas.
10/2010 2/2012	Canada	Department of Civil and Environmental Engineering, Concordia University, Montreal, QC, Canada	Post. Doc. Researcher	A key researcher in a project which was funded to enhance nutrients removal from wastewater by membrane electro-bioreactor technology. The output results of the work were patented in 2010 in USA.
6/1998- 8/2002	Jordan	Arab Potash Company	Quality Supervisor	Supervision on the quality system (ISO 14000 and ISO 9000) in the company
6/1997-6-1998	Jordan	Arab Potash	Process	I worked as a chemical

		Company	Engineer	engineer on water treatment unit in the power station plant at Arab Potash Company (APC). The Power plant at APC was designed to produce steam for power generation. As a process engineer, my task was to ensure that the water used to produce steam is well treated through many treatment units before water enters to the boilers. Water desalination by membrane process was one of the operation units used to treat the inlet water to boilers.
9/1995-6/1997	Jordan	Department of Chemical Engineering, Jordan University of science and Technology- Irbid-Jordan	Research Assistant and Teaching Assistant	I assisted in teaching courses including laboratories during my Master program: Engineering Materials. Static. Water Pollution and Control. Water Pollution and Control Lab Numerical Methods for Engineers. Applied Differential Equations.

Funded projects:

Date from – Date to	Location	donor	Position	Description
1/2016–1/2019	Jordan	Scientific Research Support fund (SRSF) (~\$ 95,000)	Principal Investigator	A grant was funded to develop an innovative device for grey water treatment by integrating electrocoagulation technique with adsorptive materials
9/2007 – 8/ 2011	Canada	The Natural Sciences and Engineering Research Council of Canada	Post. Doc. Researcher	A grant was funded to develop a new wastewater treatment System and method (Submerged Membrane Electro-Bioreactor System). The

		(NSERC)		method was registered as a patent in the United States of America in 2010 Patent Application 20100051542 .
1/2010 – 8/2012	Egypt & Saudi Arabia	King Abdullah University of Science and Technology (KAUST)	Post. Doc. Researcher	This project was in cooperation with King Abdullah University of Science and Technology (KAUST) and the Sustainable Wastewater Management (SWM) Group in the Department of Construction and Architectural Engineering at The American University in Cairo. The main project was to design a small membrane device which could be used for treating and reuse of grey water in arid and semi-arid areas.
2/2015-9/2015	Jordan	Jordan Oil Shale Company (JOSCO) (~\$ 2,500)	Project Supervisor	A grant was funded to enhance nutrients removal from wastewater by membrane electro-bioreactor technology.
2/2014-9/2014	Jordan	Jordan Oil Shale Company (JOSCO) (~\$ 2,000)	Project Supervisor	A grant was funded to investigate wastewater treatment by membrane bioreactor technology.
2/2014-9/2014	Jordan	Jordan Oil Shale Company (JOSCO) (~\$ 1,500)	Project Supervisor	A grant was funded to investigate different adsorbent materials to improve wastewater treatment by electrocoagulation.
3/2013-9/2013	Jordan	Jordan Oil Shale Company (JOSCO) (~\$ 2,600)	Project Supervisor	A grant was funded to develop a new Wastewater Treatment System to treat gray water to be used in hotels and small communities.

□ **Supervision on Master Students:**

1- Mahmoud Rsaoul Zaid Al-kilani:

- **Thesis title:** “An innovative environmental solution for coupling grey wastewater treatment and solid waste recycling in the Hashemite University using the electrocoagulation technology.

2- Mahmoud Al-Shorman:

- **Thesis title:** "A theoretical study of municipal solid waste characterization in Jordan and its economic feasibility"
- 3- Ahmad Eshdefat:**
- **Thesis title:** "Detoxification of olive mill wastewater using integrated process of electrocoagulation and adsorbent materials"

□ **Refereed Journal Publications:**

- (1) **Bani-Melhem K.**, Al-Shannag M., Alrousan D., Al-Kofahi S., Al-Qodah Z., Muhammad Rasool Al-kilani M. R., (2017). Impact of soluble COD on grey water treatment by electrocoagulation technique. *Desalination and Water Treatment*, (accepted 2017)
- (2) Al-Shannag M., Al-Qodah Z. , Nawasreh M., Al-Hamamreh Z., **Bani-Melhem K.**, Alkasrawi M. (2017) On the performance of Ballota undulata biomass for the removal of cadmium (II) ions from water, *Desalination and Water Treatment*, 67 (3) 223-230.
- (3) **Bani-Melhem K.**, Al-Qodah Z., Al-Shannag M., Qasaimeh A., Qtaishat M. R., Alkasrawi M. (2015), On the performance of real grey water treatment using a submerged membrane bioreactor system, *Journal of Membrane Science*, 476 (2015), 40–49
- (4) Al-Qodah Z., Mohammad Al-Shannag M., **Bani Melhem, K.**, Alananbeh K., Bouqellah N. (2015) Biodegradation of olive mills wastes using thermophilic bacteria, *Desalination and Water Treatment*, 56 (7) 1908-1917.
- (5) Al-Shannag M., Al-Qodah Z. , **Bani-Melhem K.**, Qtaishat M., Alkasrawi M. (2015) Heavy metal ions removal from metal plating wastewater using electrocoagulation: Kinetic study and process performance, *Chemical Engineering Journal*, 260 (2015), 749-756.
- (6) Al-Qodah A., Al-Shannag M., Assirey E., Orfali W., **Bani-Melhem K.**, Alananbeh K., Bouqellah N., Characteristics of a novel low density cell-immobilized magnetic supports in liquid magnetically stabilized beds, *Biochemical Engineering Journal*, 97 (2015), 40-49.
- (7) Al-Shannag M., Al-Qodah Z., Alananbeh K., Bouqellah N., Assirey E., **Bani-Melhem K.** (2014) COD reduction of baker's yeast wastewater using electrocoagulation, *Environmental Engineering and Management Journal*, 13(2014),12, 3153-3160.
- (8) AL-Shannag M., **Bani-Melhem K.**, Al-Anber Z., Al-Qodah Z. (2013) Enhancement of COD-Nutrients Removals and Filterability of Secondary Clarifier Municipal Wastewater Influent Using Electrocoagulation Technique, *Separation Science and Technology*. 48 (4): 673-680.
- (9) **Bani-Melhem, K.**, and Smith E. (2012) Grey Water Treatment by a Continuous Process of an Electro-coagulation Unit and a Submerged Membrane Bioreactor System, *Chemical Engineering Journal*, 198-199 (2012), 201-210.
- (10) Smith, E. and **Bani-Melhem, K.** (2012) Grey Water Characterization and Treatment for Reuse in an Arid Environment, *Water Science and Technology*, **66** (2012), 72-78.
- (11) AL-Shannag M., Lafi W., **Bani-Melhem K.**, Gharagheer F., Dhaimat O., (2012) Reduction of COD and TSS from paper industries wastewater using electro-coagulation and chemical coagulation, *Separation Science and Technology*. 47 (5): 700-708.
- (12) **Bani-Melhem, K.**, and Elektorowicz M. (2011) Performance of the

submerged membrane electoro- bioreactor (SMEBR) with iron electrodes for wastewater treatment and fouling reduction, *Journal of Membrane Science*, 379 (1-2): 434-439.

- (13) **Bani-Melhem K.**, and Elektorowicz M. (2010) Development of a novel submerged membrane electoro- bioreactor (SMEBR): Performance for fouling reduction, *Environ. Sci. and Techno.* 44 (9), 3298-3304.
- (14) Abu Al-Rub, F. A., Banat, F., and **Bani-Melhem, K.** (2003) Sensitivity Analysis of Air Gap Membrane Distillation. *Separation Science and Technology.* 38(15): 3645-3667.
- (15) Banat, F. Abu Al-Rub, F. A., and **Bani-Melhem, K.** (2003) Desalination by Vacuum Membrane Distillation: Sensitivity Analysis. *Separation Purification Technology.* 33(1): 75 – 87.
- (16) Abu Al-Rub, F. A., Banat, F. and **Bani-Melhem, K.** (2002) Parametric Sensitivity Analysis of Direct Contact Membrane Distillation. *Separation Science and Technology.* 37 (14): 3245-3271.

□ Conference Proceedings

- **Bani-Melhem, K.**, Al-Shorman M., A Theoretical Study on Municipal Solid Waste Characterizations in Jordan and Its Economic Feasibility, 1st Euro-Mediterranean Conference for Environmental Integration (EMCEI), 22-25 November 2017, Sousse, Tunisia. (Accepted).
- **Bani-Melhem, K.**, Applications of submerged membrane electro-Bioreactor for grey water treatment and reuse, 3rd International Conference on Recycling and Reuse conference, 28-30 September 2016, Istanbul, turkey.
- **Bani-Melhem, K.**, and Al-Shannag M., Reducing the disturbances of the volumetric loading rates by applying an electrical direct current field: Another advantage of the submerged membrane electro-bioreactor, Euromembrane Conference, 6-10 September 2015. Aachen, Germany.
- **Bani-Melhem, K.**, and Smith, E. (2012) Impact of Applying Electrocoagulation Pre-treatment Step on Grey Water Treatment by Submerged Membrane Bioreactor, 85th Annual Technical Exhibition & Conference, **WEFTEC 2012**, September 29–October 3, 2012, New Orleans Morial Convention Center, New Orleans, Louisiana USA.
- **Bani-Melhem, K.**, Elektorowicz M., and Jan A. Oleszkiewicz J. A. (2009) Submerged membrane electro-bioreactor (SMEBR) reduces membrane fouling and achieves phosphorus removal. 82nd Annual Water Environment Federation Technical Exhibition and Conference, **WEFTEC 2009**, October 10-14, 2009, Orlando, Florida.

□ Abstracts and Presentations

- **Bani-Melhem, K.**, and Smith, E. (2012) Performance of an integrated Electro-coagulation process with Submerged Membrane Bioreactor for Grey Water Treatment. *The International Perspectives on Water Resources & the Environment (IPWE 2012)*, January 5-7, 2012, Marrakech, Morocco.
- **Bani-Melhem, K.**, and Smith, E. (2011) Grey Water Treatment by Submerged Membrane Bioreactor Operated at Long Sludge Retention Time and Constant Transmembrane Pressure, 1st International Conference on Desalination and

Environment: A Water Summit (ICODE 2011), 29 October - 1 November, 2011, Abu Dhabi.

- **Bani-Melhem, K.**, and Smith, E. (2011) Improving the Performance of the Submerged Membrane Bioreactor with Electrocoagulation Pre-treatment for Gray Water Treatment. 6th IWA specialized *conference on membrane technology. 4-7 October 2011*. Aachen, *Germany*.
- **Bani-Melhem, K.**, and Smith, E. (2010) Comparison between the Performance of the Submerged Membrane Bioreactor with and without Electro-coagulation for the Treatment of Grey Water, IWA World Water Congress and Exhibition, September 19-24,2010 Montreal. Canada.
- **Bani-Melhem, K.**, and Elektorowicz M. (2008) A review on the efficient methods to reduce membrane fouling in submerged membrane bioreactor systems. Euromed 2008, Cooperation among Mediterranean Countries of Europe and the MENA Region King Hussein Bin Talal Convention Center, Dead Sea , Jordan, November 9–13, 2008.
- **Bani-Melhem, K.** (2003) Using concentration polarization factors to determine the mass transfer resistance in vacuum membrane distillation. *Desalination*. 157, pp.333, European conference on Desalination and the environment: Fresh water for all, Malta, 4-8 May, 2003.

□ **Industrial Training Courses and Workshops**

- Registered Internal Audit Course about ISO 9000 / Organized by SGS-Yarsley ICS-UK, Amman.
- “Environmental Management System and Environmental Auditing According to ISO 14000 Standard”, held at Royal Scientific Society, Amman-Jordan, 20-23 August 2001.
- The main Concepts of ISO 14000 Documentation, Organized by Quality Consultants, Amman.
- Version 2000 of ISO 9000 Series Course/ Organized by Talal Abo-Gazaleh Center-Amman.
- **Safety in laboratories.** A training course was given to Qatar Petroleum employees between June 16 and June 19, 2012. AL Doha –Qater.
- **Training Courses on ISO 9000 and ISO 14000.** During my work at Arab Potash Company, many training courses on quality management system (ISO 9000) and Environmental Management System (ISO 14000) were given to many employees in different departments at Arab Potash Company, Jordan.

□ **Supervision Activities**

- Supervision on 1 PhD student and 2 Master students at the American university in Cairo
- Supervision on graduated students in the Civil and environmental engineering department at Concordia University (2 PhD students and 2 master students).
- Member in scientific and social committees in chemical engineering department, Mutah University-Jordan.
- Supervisor and coordinator for ISO 9000 project (Quality management system) and ISO 14000 projects (environmental management system) for about three years.

- Participation in Preparing for King Abdullah II award for excellent at APC company
- Participation Arthur Anderson Team in Re-Organization Structure for APC Company.
- Participation in the organizing committee to prepare for 22nd CAWQ Eastern Canadian Symposium on Water Research, which was hold at Concordia University in November 2006.

□ **College and Department Committees**

- Coordinator and Member in Graduate Studies Committee (Department)
- Coordinator of establishing Students training program (Department)
- Member of Scientific Research Committee (Department)
- Coordinator of Supplying Laboratories (Department)
- Member in Graduate Studies Committee (College)
- Member of Scientific Research Committee (College)
- Member of Amending study plan (College)
- ABET Accreditation Preparation Committee (College)