EDUCATION

9/04-4/08 Concordia University, Montreal, QC, Canada
Ph.D. in Material Science

9/01-4/03 Jordan University of Science and Technology, Irbid, Jordan
Master of Science in Mechanical Engineering

Ranking: First place in the faculty of engineering

9/96-4/01 Jordan University of Science and Technology, Irbid, Jordan
Bachelor of Science in Mechanical Engineering with Honour.
Ranking: First place in the department

Qualifications Highlights

- Over eight years of experience in scientific research and experimental development.
- Have published a significant number of articles in peer reviewed journals and conference proceedings.
- Have the curiosity and the scientific aptitude to solve challenging scientific problems.
- Take the initiative and have pride in my work, have good time management skills.
- In depth knowledge of applying thermodynamic calculations for a given manufacturing process.
- Extensive experiences in phase transformation, heat treatment, alloy design and development, casting, solidification, and process-structure relationship in casting.
- Knowledge of thermo-mechanical process, including microstructure evolution, precipitates and techniques for process monitoring and characterization.
- Generating and drafting research proposals.
- Experience in initiating collaborative research activities.

Work History

2012-Present **Assistant Professor, Industrial Eng., Hashemite University**
2011-2012 **Assistant Professor, Mechanical Eng., Mutah University**
2009-2011 **Natural Resources of Canada, CANMET-MTL, Canada**
2010-2011 **Visiting Professor-McMaster University, Canada**

- Investigated the effect of alloying elements (Ca, Sr and Ce) and different solidification conditions on microstructure of AZ31 alloy.
- Developed and designed new alloys for wrought magnesium sheet using thermodynamic calculations.
- Designed scientific research experiments to undertake sheet production for magnesium alloys.
- Optimized the process parameters of Twin Roll Casting (TRC) to be used for magnesium alloys.
- Reviewed, evaluated and analysed technical research papers on the hot rolling and twin roll casting processes.
- Commissioning and maintenance of melting furnace, headbox and rolls in TRC.

2008-2009 **The University of Western Ontario, London, Postdoctoral Fellow**

- Constructed structure-property relationship in high pressure die-casting process for AM60B, AZ91D and AE44 magnesium alloys.
- Help in developed the capability to predict local variations in the as-cast microstructure and, thereby, predict local variations in the mechanical properties of large, geometrically complex magnesium castings.
- Supervised graduate students.
- Developed experimental techniques to investigate microstructure variation in high-pressure die-cast magnesium components based on the solidification conditions.
- Planned and executed innovative research projects.
- Contributed in drafting strategic research proposal for AUTO21-Magnesium casting ($91K/year for four years).
- Supervised graduate students.

2004-2008 **Concordia University, Montreal, QC, Canada, Graduate Research Assistant**

- Constructed the phase equibria of magnesium-aluminum based alloys using thermodynamic modeling and experimental techniques.
- Established solidification curves using thermal analysis and Schiel simulation.
- Employed scientific techniques, such as XRD, DSC, SEM and optical microscopy for phase equilbria.
- Initiated collaboration between Concordia University and GM.
- Tracked of individual alloys during heat treatment or solidification by the calculation the phase distribution and compositions.
- Extensive experience in using ***FactSage*** software for thermodynamic calculations and phase transformations.
- Guided and assisted graduate students in their research.
- Conducted classes and tutorial sessions.
- Designed, implemented and evaluated assignments and exams for many courses.
- Guided and assisted graduate students in their research.

2001-2003 **Jordan University of Science and Technology, Graduate Research Assistant**

- Designed scientific experiments to produce biodiesel from WAF and WVO.
- Conducted factorial design for transesterification process.
- Implemented statistical analysis to study the interaction parameters of the conversion process.
- Assisted in developing and planning labs, assignments and undergraduate projects.
- Taught many courses at graduate level to first-year students

2001-2002 **Ministry of Workshop, Mechanical Eng. Dep., Jordan**
Engineer

- Created and maintained company quality documentation, such as quality manuals and procedures.
- Evaluated suppliers and contractors qualifications.
- Applied statistical methods to estimate future manufacturing requirements and potential

Implemented continuous improvement projects to improve productivity.

1998-2002 **Private Teacher**

- Teaching high school courses such as mathematics, physics and chemistry.
- Teaching undergraduate courses in Mechanical Engineering such as Material Science, Dynamics, Thermodynamics, Applied Mathematics for Engineering,…etc.

AWARDS

- Visiting Fellowship in Governmental Laboratories (**VFG-NSERC**).
- Industrial R&D Fellowship (**IRDF-NSERC**).
- Postdoctoral Fellowship-**FQRNT** (Government of Québec, Canada).
- **CALPHAD-STT** Scholarship (Pennsylvania State University, USA).
- Concordia University Entrance Fellowship.
- Campaign for a New Millennium Student Contribution Graduate Scholarship.
- Canadian National Award in Transportation Studies.
- Concordia University International Tuition Fee Remission.
- Engineering and Computer Science Graduate Scholarship.
- Research Day presentation at Concordia University-First place.
- ASM student night, Poster Presentation-Second place (Montreal University, Canada).
- **Governor Golden Medal**, Jordan University of Science & Tech, Irbid-Jordan.
- Jordan University of Science & Tech for the First Ranking in the Department.

Scientific and Professional Membership

- **P**rofessional **E**ngineers of **O**ntario (**PEO**)
- **Mag**nesium **Net**work (**MagNet**)**.**
- Magnesium Front End Research & Development (**MFERD**)
- **AUTO21** Network of Centres of Excellence
- Canadian Institute of Mining and Metallurgy and Petroleum (**CIM**)
- Jordanian Society of Mechanical Engineers
- Postdoctoral Fellow Association, University of Western Ontario
- BASEF Judge-Professional Engineer Representive

CONTRIBUTION TO RESEARCH AND DEVELOPMENT

a. Articles Published in Refereed Journals

1. M. Aljarrah and E. Essadiqi (2013) “On the Precipitates and Mechanical Properties of Magnesium-Yttrium Sheets”, Alexandria Engineering Journal, 52(2), pp. 221-225.

2. M. Aljarrah and E. Essadiqi (2012) “The Influence of Micro-alloying and Cooling Rate on Microstructure of Hot Rolled and Annealed AZ31 Sheet” International Review of Mechanical Engineering, September 2012, 6(6), pp. 1139-1145.

3. M. Aljarrah, M., Essadiqi, E., Kang, D.H. and Jung, In-Ho (2011) “Solidification microstructure and mechanical properties of hot rolled and annealed Mg Sheet produced through twin roll casting route”. Material Science Forum, (690), pp. 331-334.

4. Khan, N.H., **Aljarrah, M.**, Medraj, M. and Wood, J.T. (2010) “The effect of cooling rates on thermo-physical properties of Magnesium Alloys” Journal of Materials Research, 26(8), 974-982, 2011.

5. **Aljarrah, M.**, Medraj, M., Li, Jian, Essadiqi, E. (**Invited paper**, 2009) “Phase Equilibria on the Mg-Al-Ca-Sr System”. Journal of Material. 61(5):68-74.

6. **Aljarrah, M.**, and Medraj, M. (2008) "Thermodynamic Assessment of the Phase Equilibria in the Al-Ca-Sr System Using the Modified Quasichemical Model". Journal of Chemical Thermodynamics. 40(4): 724-734.

7. **Aljarrah, M.**, and Medraj, M. (2008) "Thermodynamic Modeling of the Mg- Ca, Mg-Sr, Ca-Sr and Mg-Ca-Sr Systems Using the Modified Quasichemical Model". CALPHAD (Computer Coupling of Phase Diagrams and Thermochemistry). 32(2): 240-251.

   According to Science Direct, this article was rated one of the top 25 hottest articles.

8. **Aljarrah, M.**, Medraj, M., Wang, X., Essadiqi, E., Dénès, G., and Muntasar, A. (2007) "Experimental Investigation of the Mg-Al-Ca System". Journal of Alloys and Compounds. 438(1-2): 131-141.

9. **Aljarrah, M.**, Parvez, M.A., Li, Jian, Essadiqi, E., and Medraj, M. (2007) "Microstructural characterization of Mg-Al-Sr alloys". Science and Technology of Advanced Materials. 8(4): 237-248.

10. **Aljarrah, M.**, Aghaulor, U., and Medraj, M. (2007) "Thermodynamic Assessment of the Mg-Zn-Sr System". Intermetallics. 15(2): 93-97.

11. Tashtoush, M.G., Al-Widyan, M.I., and **Aljarrah, M.** (2004) Experimental Study on Evaluation and Optimization of Conversion of Waste Animal Fat into Biodiesel. Energy Conversion and Management. 45(17): 2697-2711.

b. Articles Published in Refereed Conference Proceedings

1. **Aljarrah, M.**, Essadiqi, E., Kang, D.H. and Jung, In-Ho "Solidification microstructure and mechanical properties of hot rolled and annealed Mg Sheet produced through twin roll casting route". Proceeding of the Light Metals Technology 2011, Lüneburg, Germany, July 19-22, 2011.

2. Jian, V., Su, J.Q., Mishra, R.S., Verma, R., Javid, A., **Aljarrah, M.** and Essadiqi, E., "Microstructure and Mechanical Properties of Mg-1.7Y-1.2Zn Sheet Processed by Hot Rolling and Friction Stir Processing", TMS 2011, February 27 - March 3, 2011 • San Diego, California, pp. 565-570, 2011.

3. Medraj, M., Kevorkov, D., Zhang, Y., Khan, M., **Aljarrah, M.**, "Combinatorial Approach to the Development and Application of Multicomponent Thermodynamic Database for the Mg Alloys Systems" MS&T 2010, October 17-21, 2010: Houston, TX.

4. **Aljarrah, M.**, Essadiqi, E., R. Verma and R.S. Mishra, "Microstructure Evolution and Mechanical Properties of Mg-Y-Zn Sheets" MS&T 2010, *Light Weight Materials for Vehicles and Components*, October 17-21, 2010: Houston, TX, pp. 714-727.

5. **Aljarrah, M.**, Medraj, M., Li, Jian, and Essadiqi, E. (2007) Thermodynamic Modeling and Experimental Investigation of the Magnesium-Aluminum-Calcium-Strontium System. Proceeding of the Light Metals Technology 2007. Saint-Sauveur, QC, Canada, September 24-26, 53-57.

6. **Aljarrah, M.**, Parvez, M.A., Wang, X., Essadiqi, E., Li, Jian, and Medraj, M. (2006), Mg-Al-(Ca, Sr) Systems- An Experimental Analysis, COM 2006, Magnesium Technology in the Global Age, Montreal, Canada, October 1-4, 701-712.

c. Presentation

1. **Aljarrah, M.** and Essadiqi, E. (2010) Twin Roll Casting of AZ31 at CANMET, MagNet Theme I and II Joint Meeting, Ecole Polytechnique, Montreal, May 12, 2010.

2. Medraj, M., Keverkov, D., Zhang, Y., Khan, M.N., and **Aljarrah, M.** (2010) MagNet Theme I and II Joint Meeting, Ecole Polytechnique, Montreal, May 12, 2010.

3. Medraj, M., Khan, M.N., **Aljarrah, M.**, and Wood, J.T., (2010) Investigation of the solidification behavior of commercial Mg alloys through experiments and thermodynamic calculations, CALPHAD XXXIX, May 23-28, 2010, Jeju, KOREA.

4. Kevorkov, D., Medraj, M., Li, Jian, Essadiqi, E., **Aljarrah**, **M.** and Chartrand, P., (2009) Experimental Study of the Al-Mg-{Ca,Sr} Ternary Phase Diagrams at 400ºC and Comparison with Thermodynamic Models, CALPHAD meeting, May 17-22, Prague, Czech Republic, 2009.

5. **Aljarrah, M.**, and Medraj, M. (2007) Thermodynamic modeling of the Mg-Al-Ca-Sr system using the modified quasichemical model, CALPHAD Meeting, Pennsylvania, State Collage, USA, May 6-11.

6. **Aljarrah, M.** (2009) "Magnesium casting process and phase equilibria in magnesium alloys". Invited speaker at **IMDEA Materials**-Spain

7. **Aljarrah, M.**, and Medraj, M. (2008) Phase Equilibria on the Mg-Al-Ca-Sr System, ASM Student's Night, Montreal University, Montreal, Quebec, Canada.

8. **Aljarrah, M.**, and Medraj, M. (2007) Experimental investigation and thermodynamic modeling of the Mg-Al-Sr ternary system. ASM Student's Night, Concordia University, Montreal, Quebec, Canada.

9. **Aljarrah, M.**, and Medraj, M. (2006) Phase equilibria in the Mg-Al-Ca ternary system. ASM Student's Night, Ecole de Technologie Superieure, Montreal, Quebec, Canada.

10. **Aljarrah, M.**, and Medraj, M. (2005) Solidification and latent heat study of the Mg-alloys using DSC. ASM Student's Night, Concordia University, Montreal, Quebec, Canada.

Miscellaneous

11. **Aljarrah**, **M.,** Weiler, J.P., Ferrokhnejad, M., Wood, J.T. and Straatman, A., Magnesium Casting Processes, AUTO21, Hamilton,ON, Canada, May 26-29, 2009.

12. Lobo, N., **Aljarrah, M.,** and Essidiqi, E. "Literature review of strip casting of Mg alloys - RELATED ARTICLES ON Mg ALLOY – TWIN ROLL CAST" Technical Report, CANMET-MTL- 2010.

13. My work was featured in **Concordia University Journal**, "Developing Improved Fuel Efficiency", January 25, 2007, Vol. 2, No. 9.