

Mohamed H. Alhabeb

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EDUCATION:

Drexel University, Philadelphia, PA

- PhD candidate, Materials Science and Engineering *Spring 2013 – present*
Adviser: Prof. Yury Gogotsi
Research interest: *Processing, structure and size effect properties of 2D metal carbides(MXenes)*

University of Massachusetts, Lowell, MA

- M.S. in Chemical Engineering *Spring 2012*
- Graduate Certificate in Materials Science and Engineering *Spring 2013*
- Graduate Certificate in Biotechnology and Bioprocessing *Spring 2013*

Tripoli University, Tripoli, Libya

- Graduate Certificate in Chemical Engineering *Spring 2007*

Sirte University, Sirte, Libya

- BSc. in Chemical Engineering GPA 3.7 *Spring 2003*

PROJECTS & EXPERIENCE:

Drexel University, Philadelphia, PA

- **Research Assistant** *Fall 2015 - Present*
 - Designed and mentored projects for undergraduate STAR project program at Drexel.
 - Trained and supervised undergraduate and visiting graduate students.
 - Developed processable and scalable methods for synthesis and delamination of large flakes 2D metals carbide (MXenes).
 - Defects analysis in singles layer titanium based carbide MXenes.
 - Synthesis of new MXenes and study their optical and mechanical properties
 - Synthesis of graphene oxide and graphene-MXene composites
 - Wrote proposal for ORNL to study 2D MXene flakes with Neutron scattering techniques.

Energy Frontier Research Center, Oak Ridge National Laboratory

- **Group Leader** *August 2016*
 - Led a breakout session in FIRST 2016 All Hands Annual Meeting consisting of faculty, postdoctoral researchers, and senior scientists
 - Wrote a summary of the breakout session specifying key experiments/ studies to be done during 2017.

Chemical Engineering Department, University of Massachusetts, Lowell, MA

- **Outreach Assistant** *Spring 2011 - Spring 2012*
 - Conducted experiments for prospective students
 - Guided participants through experiential learning events
- **Research & Teaching Assistant** *Fall 2011 - Spring 2012*
 - Taught and graded Advanced Mathematics for grad and undergraduate students
- **Student Advisor** *Summer 2011*
 - Provided oversight for a visiting undergraduate student involved with a study to determine the effectiveness of various conductive coatings for smart fabrics
 - Monitored and reviewed student progress in collaboration with other engineering departments
 - Assisted in preparation of final report and presentation

Alsharara High School, Tahala, Libya

- **High School Teacher** *Dec. 2003 - Mar. 2005*
 - Taught chemistry and biology to sophomores and juniors

HONORS & AWARDS:

- Doctoral Fellowship, Drexel University *Fall-2015 - Present*
- Full Libyan government scholarship for PhD's degree *April 2013- Sep. 2015*
- Full Libyan government scholarship for Master's degree *Sep. 2009 - Dec. 2011*
- Graduated as the top chemical engineering student, Sirte University, Libya, *July 2003*

EDUCATIONAL OUTREACH & VOLUNTEERING SERVICES:

- Materials Camp Program** *June 2016*
- Volunteered in this week-long program to run a demo for high school students to attract their attention to the field of materials science
- STAR Project Program** *August 2015*
- Volunteered as a judge to evaluate posters presented by undergraduate students as a part of their summer project.
- SciBRIDGE Program** *May 2015*
- Assembled and prepared home-made educational tools to make science accessible to high school students in Ethiopia and Uganda through on-hand training
- Our Mother of Sorrow's Science Club:** *March 2015*
- Involved in after school science club as a demo leader in West Philadelphia middle school where students received hand training and oversaw run experiments.
- Science Saturdays Program** *May 2014*
- Volunteered in conducting a demo for high school students to introduce them to materials science.

LANGUAGES & SKILLS:

- Fluent in English, Arabic, and Tamashek
- Tools: XRD, Raman spectroscopy, SEM, UV-vis, FTIR, cyclic voltammetry, and Battery characterization.
- Background in cGMP
- Hands on Polymath, Matlab, Origin, Crystal maker.
- Microsoft Office Suite

PUBLICATIONS:

Peer Reviewed Articles

- F. Shahzad*, **M. Alhabe***, C.Hatter*, B. Anasori, S.M. Hong, C-M. Koo, Y. Gogotsi Electromagnetic Interference Shielding with 2D Transition Metal Carbides (MXenes). **Science** (2016) (accepted) (* equal contribution)
- A. Lipatov*, **M. Alhabe***, M.R. Lukatskaya, Y. Gogotsi, A. Sinitskii. *Effect of synthesis conditions on stability and electronic properties of single Ti_3C_2 MXene flakes.* **Adv. Electro Mater**, 2016 (* equal contribution).
- Xiahn Sang, Yu Xie, Ming-Wei Lin, **Mohamed Alhabe**, Katherine L. Van Aken, Yury Gogotsi, Paul R.C. Kent, Kai Xiao, Raymond R. Unocic. *Atomic Defects in Monolayer Titanium Carbide ($Ti_3C_2T_x$) MXene.* **ACS Nano** (2016), just accepted.
- Y.-Y. Peng, B. Akuzum, N. Kurra, M.-Q. Zhao, **M. Alhabe**, B. Anasori, E. C. Kumbur, H. N. Alshareef, M.-D. Ger, Y. Gogotsi, *All-MXene (2D titanium carbide) Solid-State Microsupercapacitors for On-Chip Energy Storage.* **Energy & Environmental Science**, 9, 2847-2854 (2016)
- Chang E Ren, Kelsey B Hatzell, **Mohamed Alhabe**, Zheng Ling, Khaled A Mahmoud, Yury Gogotsi. *Charge-and Size-Selective Ion Sieving Through $Ti_3C_2T_x$ MXene Membranes.* **J. Phys. Chem. Lett.**, 2015, 6 (20), pp 4026-403.
- M. Boota, K.B. Hatzell, **M. Alhabe**, E.C. Kumbur, Y. Gogotsi. *Graphene-containing flowable electrodes for capacitive energy storage.* **Carbon**, Volume 92, 2015, pp 142-149.
- **M. Alhabe**, M. Beidaghi, K. Van Aken, Y. Gogotsi. *Freestanding graphene/carbide derived carbon films as high-performance electrodes for electrochemical capacitors.* (under preparation)

Selected Oral Presentation:

- **Mohamed Alhabe**, Kathleen Maleski, Yury Gogotsi. "MILD synthesis of 2D titanium carbides (MXene)". 252nd ACS National Meeting & Exposition, Philadelphia, PA, USA, (2016)
- **Mohamed Alhabe**, Majid Beidaghi, Katherine L Van Aken, Yury Gogotsi. *Freestanding Graphene/Carbide Derived Carbon Films as High-Performance Electrodes for Electrochemical Capacitors*. ECS meeting 2015, Phoenix, AZ-USA.

Selected Poster Presentation:

- **Mohamed Alhabe**, Kathleen Maleski, Yury Gogotsi. "MILD synthesis of 2D large flakes of Ti_3C_2 (MXene). 252nd ACS National Meeting & Exposition, Philadelphia, PA, USA, (2016)
- **Mohamed Alhabe**, Majid Beidaghi, Katherine Van Aken, Yury Gogotsi. "Binder-free graphene/carbide derived carbon electrodes for high-performance supercapacitors.
- **Mohamed Alhabe**, Srikanthrao Agnihotra, Sumedh P. Surwade, Akshay Vaidya, Laura K. Fuentes Burgos, Christopher Niezrecki, David J. Willis, Sanjeev K. Manohar. "Chemical method to obtain highly conducting silver coatings on flexible substrates" 243rd ACS National Meeting & Exposition, San Diego, CA, USA, (2012), IEC-193.
- Srikanthrao Agnihotra; **Mohamed Alhabe**; Sumedh P. Surwade.; Laura K. Fuentes Burgos.; Mark Lalli.; Neha Manohar; Akshay Ajbani; Sanjeev K. Manohar. "Coating of soft organic electronic materials on synthetic fabrics and threads". 243rd ACS National Meeting & Exposition, San Diego, CA, USA, (2012), IEC-194.

Patents:

- Yury Gogotsi, Chong-Min Koo, Babak Anasori, **Mohamed Alhabe**, Christine Hatter, Faisal Shahzad. "MXene films and composites for EMI shielding" (filed)

PROFESSIONAL ACTIVITIES AND MEMBERSHIPS:

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| • The Electrochemical Society (ECS) | <i>Mar. 2012 - present</i> |
| • Material Research Society (MRS) | <i>Sep. 2015 - present</i> |
| • American Chemical Society (ACS) | <i>Sept. 2011 - present</i> |
| • Graduate student association, Drexel university | <i>Sep. 2013 - present</i> |
| • American Institute of Chemical Engineers (AIChE) | <i>Feb.2011 - Fall 2013</i> |
| • National Association of Corrosion Engineers (NACE) | <i>Mar. 2010 - Fall 2013</i> |
| • Certificate in Internal Corrosion for Pipelines-Basic, <i>June 2010</i> | |
| • Nanomanufacturing Club, University of Massachusetts, Lowell | <i>Sep.2010 -May2013</i> |

REFERENCES:

- Available upon request