

## MICHAEL A. GREEN

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Experienced laboratory scientist with a fluent understanding of materials fabrication and characterization, and proficient programmer with expertise in data analysis and visualization, computational modeling, and application development. Multiple years of research experience resulting in the authoring of numerous research publications and oral presentations. Research featured and published in several top-5 journals for materials science and photonics, such as *Materials Today* and *Light: Science & Applications*. Driven individual who possesses the desire to take on the greatest of challenges with logical and intelligent approach.

### Education

Ph.D. Chemistry, University of Missouri, Kansas City MO. *Expected May 2020.*

*Dissertation:* “On the development of dielectric and magnetic materials for electromagnetic interference shielding” – Principal Advisor: Dr. Xiaobo Chen

M.Sc. Chemistry, University of Missouri, Kansas City MO. *May 2019.*

*Seminar:* “Computational Methods for Chemistry: Experimental Analysis and Data Visualization in Python 3.7” – Principal Advisor: Dr. Xiaobo Chen

B.Sc. Chemistry (minor Mathematics), University of Idaho, Moscow ID. *July 2016.*

*Research:* “Activity of nanostructured C@ETS-10 sorbent for capture of volatile radioactive iodine from gas stream” – Principal Advisor: Dr. Vivek Utgikar

### Professional Experience

**Research Assistant**, Department of Chemistry, University of Missouri, Kansas City MO. *Aug. 2016 – present*

Developed micro- and nanoscale materials for application in clean energy systems, photocatalysis, water photolysis, physical adsorption, and microwave absorption. Dissertation research focused on understanding and utilizing the bulk dielectric and magnetic field properties of materials so to induce interaction with GHz-range electromagnetic radiation. Utilized and established a wide variety of synthesis methodologies to generate materials such as pure and perturbed -oxides (Titanium, Aluminum, Silicon, Zirconium, *et alia*), -sulfides (Copper, Copper-Iron, Cobalt, *et alia*), -phosphides (Iron, Cobalt), conductive polymers, graphitic carbon nitrides, polyoxometalates, and metal-organic frameworks, through fabrication processes such as solvothermal/hydrothermal methods and PECVD. Utilized a broad array of instrumentation techniques, such as Complex Permittivity and Permeability Network Analysis, Polarized Light Microscopy, UV-Vis Spectroscopy, Raman Vibrational Spectroscopy, SEM/EDX, TEM, XPS, XRD, BET, FTIR, ESR, NMR/SSNMR, PALS, *et alia*, for materials characterization and analysis. Developed computational programs which utilized data-driven methods so to analyze experimental data sets. Programs resulted in an ability to accurately predict materials performance. Established laboratory protocols for the treatment and disposal of hazardous chemical waste in accordance with EH&S, EPA, and the State of Missouri guidelines. Research supported by the National Science Foundation under NSF grant 1609061, and affiliated/collaborated with The Environmental Protection Agency, Lawrence Berkeley National Laboratory, the Chinese Academy of Sciences, *et alia*.

**Teaching Assistant**, Department of Chemistry, University of Missouri, Kansas City MO. *Jan. 2017 – May 2018; Jan. 2019 – May 2019*

Prepared and presented in-depth chemistry material for undergraduate collegiate studies, and supervised in-lab experimental procedures. Participated in experimental preparation, which included the maintenance of legacy laboratory equipment such as GC, distillation, UV-Vis, Bomb Calorimeter, Oscilloscope, and FTIR equipment. Worked with students to update laboratory procedures, including but not limited to writing software to automate experimental analysis and revamping experimental procedures. Frequently interacted with students via small group and one-on-one tutoring on a weekly basis. Oversaw the fair, responsible grading for submitted laboratory coursework.

Laboratory courses taught include General Chemistry (150 students per semester, 3 semesters), Elements of Chemistry (20 students per semester, 1 semester), and Experimental Physical Chemistry (20 students per semester, 2 semesters).

**Research Assistant**, Department of Chemical and Materials Engineering, University of Idaho, Moscow ID. *Jan. 2014 – July 2016*

Studied the properties of volatile elements that were the result of nuclear fission. Research focused on the physical adsorption of volatile radionuclei onto various materials synthesized in lab, such as hollow carbon nano-polyhedrons and metal-organic frameworks. Work involved theoretical studies of molecular compounds, synthesis of compounds, analysis (GC/MS, BET, XRD, Raman, UV-Vis, *et alia*), the engineering and construction of testing apparatuses and miscellaneous devices for general laboratory use, and composition of written material for publication. Research was conducted in conjunction with the US Department of Energy and the Idaho National Laboratory.

### **Philanthropy**

**Chemistry Instructor**, School of Medicine, University of Missouri, Kansas City MO. *Aug. 2016 – present*

Lectured on chemistry topics for both the Saturday Academy and Summer Scholars diversity outreach programs offered through the University of Missouri School of Medicine in Kansas City, MO. For Saturday Academy, responsibilities consisted of designing and presenting chemistry lectures over the weekends to enrolled middle and high school students from the Kansas City area who had the desire to obtain more exposure to math and science in their pre-collegiate education. Topics covered therein included General Chemistry, Environmental Chemistry, Organic Chemistry, and Physical Chemistry. The summer scholars outreach program consisted of an intensive two-week lecture series for Kansas City area high school seniors, focusing on Organic Chemistry fundamentals, Organic Chemistry Reactions, and Biochemistry.

### **Awards, Honors, and Memberships**

Memberships; AAAS, American Chemical Society

Reviewerships; Journal of Materials Research

Assistantships; Graduate Research (*May 2018 – Jan. 2019; May 2019 – present*), Graduate Teaching (*Jan. 2017 – May 2018; Jan. 2019 – May 2019*), Undergraduate Research (*May 2014 – July 2016*)

Awards; Microelectrovolt Electromag. Scholarship, (*Aug. 2018 – present*), Doctoral N/R (*Jan. 2017 – present*)

Honors; ΦΚΦ (2019) *for attaining a graduation class rank above the 90<sup>th</sup> percentile*  
ΣΕ (2019) *for exemplary scholarship demonstrated through published research*

## **Mentored Students**

S. Alzuabi, graduate researcher. Current position: M.Sc. student, University of Missouri, Kansas City MO.

T. Bayomi, graduate researcher. Current position: M.Sc. student, University of Missouri, Kansas City MO.

A. Nambiar, undergraduate researcher. Current position: M.D. medical student, University of Missouri, Kansas City MO.

C. Ramsey, undergraduate researcher. Current position: M.D. medical student, University of Missouri, Kansas City MO.

S. Atkins, undergraduate researcher. Current position: Ph.D. graduate student, The Ohio State University, Columbus, OH.

A. Roach, undergraduate researcher. Current position: Ph.D. graduate student, Bowling Green State University, Bowling Green, OH.

T. Gardner, undergraduate researcher. Current position: research scientist, Nostrum Laboratories, Inc. Kansas City, MO.

L. Hoang, undergraduate researcher. Current position: laboratory technician, ExxonMobil, Kansas City, MO.

M. Dressler, undergraduate researcher. Current position: B.Sc. chemistry undergraduate student, University of Missouri, Kansas City MO.

A. Tran, undergraduate researcher. Current position: B.Sc. chemistry undergraduate student, University of Missouri, Kansas City MO.

J. Velazquez, undergraduate researcher. Current position: B.Sc. chemistry undergraduate student, University of Missouri, Kansas City MO.

R. Smedley, undergraduate researcher. Current position: B.Sc. chemistry, undergraduate student, University of Missouri, Kansas City MO.

H. Nawaz, undergraduate researcher. Current position: B.Sc. chemistry, undergraduate student, University of Missouri, Kansas City MO.

## **References**

### **Dr. Xiaobo Chen**

Email: chenxiaobo@umkc.edu

### **Dr. James Murowchick**

Email: murowchickj@umkc.edu

### **Dr. Richard Buszek**

Email: buszekk@umkc.edu

### **Dr. Charles Wurrey**

Email: wurreyc@umkc.edu

### **Dr. Kathleen Kilway**

Email: kilwayk@umkc.edu

### **Dr. Vivek Utgikar**

Email: vutgikar@uidaho.edu

### **Full List of Published Works**

17. M. GREEN, Y. LI, Z. PENG, X. CHEN. “Dielectric, magnetic, and microwave absorption properties of polyoxometalate-based materials.” *J Magn. Magn. Mater.* Accepted, October 2019.
16. M. GREEN, X. CHEN. “Recent progress of nanomaterials for microwave absorption.” *J. Materiomics*. In Press, July 2019.
15. F. TAO, M. GREEN, A. VALENZUA GARCIA, T. XIAO, A. T. V. TRAN, Y. ZHANG, Y. YIN, X. CHEN. “Recent progress of nanostructured interfacial solar vapor generators.” *Appl. Mater. Today*. Volume 17, Pg. 45-84, July 2019.
14. F. TAO, M. GREEN, A. T. V. TRAN, Y. ZHANG, Y. YIN, X. CHEN. “Plasmonic Cu<sub>9</sub>S<sub>5</sub> nanonets for microwave absorption.” *ACS Appl. Nano Mater.* Volume 2, Pg. 3836-3847, June 2019.
13. M. GREEN, A. TRAN, R. SMEDLEY, A. ROACH, J. MUROWCHICK, X. CHEN. “Microwave Absorption of Magnesium/Hydrogen-Treated Titanium Dioxide Nanoparticles.” *Nano Mater. Sci.* Volume 1, Issue 1, Pg. 48-59, March 2019.
12. M. GREEN, P. XIANG, Z. LIU, J. MUROWCHICK, X. TAN, F. HUANG, X. CHEN, “Microwave Absorption of Aluminum/Hydrogen Treated Titanium Dioxide Nanoparticles.” *J. Materiomics*. Volume 5, Issue 1, Pg. 133-146, March 2019.
11. M. GREEN, Z. LIU, P. XIANG, Y. LIU, M. ZHOU, X. TAN, F. HUANG, L. LIU, X. CHEN. “Doped, conductive SiO<sub>2</sub> nanoparticles for large microwave absorption.” *Light: Science & Applications*. Volume 7, Article 87, November 2018.
10. M. GREEN, Z. LIU, R. SMEDLEY, H. NAWAZ, X. LI, F. HUANG, X. CHEN. “Graphitic Carbon Nitride Nanosheets for Microwave Absorption.” *Materials Today Physics*. Volume 5, Pg. 78-86, June 2018.
9. M. GREEN, Z. LIU, P. XIANG, X. TAN, F. HUANG, L. LIU, X. CHEN. “Ferric Metal-Organic Framework for Microwave Absorption.” *Materials Today Chemistry*. Volume 9, Pg. 140-148, June 2018. *Featured in Materials Today*
8. M. GREEN, J. XU, L. HUALONG, J. ZHAO, K. LI, L. LIU, H. QIN, Y. ZHU, D. SHEN, X. CHEN. “Terahertz Absorption of Hydrogenated TiO<sub>2</sub> Nanoparticles.” *Materials Today Physics*. Volume 4, Pg. 64-69, April 2018
7. M. GREEN, L. TIAN, P. XIANG, J. MUROWCHICK, X. TAN, X. CHEN. “FeP Nanoparticles: A New Material for Microwave Absorption.” *Materials Chemistry Frontiers*. Volume 2, Pg. 1119-1125, March 2018
6. M. GREEN, L. TIAN, P. XIANG, J. MUROWCHICK, X. TAN, X. CHEN. “Co<sub>2</sub>P Nanoparticles for Microwave Absorption.” *Materials Today Nano*. Volume 1, Pg. 1-7, March 2018
5. Y. LIU, Z. LI, M. GREEN, M. JUST, Y. LI, X. CHEN, “Titanium Dioxide Nanomaterials for Photocatalysis.” *Journal of Physics D: Applied Physics*. Volume 50, Number 19, Pg. 1-15, April 2017

4. L. TIAN, J. XU, M. JUST, M. GREEN, L. LIU, X. CHEN. "Broad Range Energy Absorption Enabled by Hydrogenated TiO<sub>2</sub> Nanosheets: from Optical to Infrared and Microwave." *Journal of Materials Chemistry C*. Volume 5, Pg. 4645-4653, April 2017.

3. S. U. NANDANWAR, K. COLDSNOW, M. GREEN, V. UTGIKAR, P. SABHARWALL, D. E. ASTON. "Activity of nanostructured C@ETS-10 sorbent for capture of volatile radioactive iodine from gas stream." *Chemical Engineering Journal*. Volume 287, Pg. 593-601, March 2016.

2. S. U. NANDANWAR, J. DANTAS, K. COLDSNOW, M. GREEN, V. UTGIKAR, P. SABHARWALL, D. E. ASTON. "Porous microsphere of magnesium oxide as an effective sorbent for removal of volatile iodine from off-gas stream." *Adsorption: Journal of the International Adsorption Society*. Volume 22, Issue 3, Pg. 335-345, April 2016.

1. S.U. NANDANWAR, K. COLDSNOW, M. GREEN, V. UTGIKAR, P. SABHARWALL, D. E. ASTON. "Treatment of Radioactive Contaminants in Off-Gases Using Carbon Supported ETS-10 nanosorbent." *Transactions of the American Nuclear Society*. Volume 111, Pg. 1121-1122, November 2014.

### **Full List of Presentations**

8. M. GREEN, X. CHEN. "Aluminum/Hydrogen treatment of Titanium Dioxide Nanoparticles for Microwave Absorption." American Chemical Society Midwest Regional Meeting, Oral Presentation. October 18<sup>th</sup>, 2019. Wichita, KS.

8. M. GREEN, X. CHEN. "Data Functionalization for Gas Chromatography in Python." American Chemical Society Midwest Regional Meeting, Oral Presentation. October 18<sup>th</sup>, 2019. Wichita, KS.

7. M. GREEN. "Computational Methods for Chemistry: Experimental Analysis and Data Visualization in Python 3.7." Department of Chemistry Graduate Seminar, Oral Presentation. March 6<sup>th</sup>, 2019. Kansas City, MO.

6. M. GREEN, X. CHEN. "Ferric Metal-Organic Framework for Microwave Absorption." American Chemical Society Midwest Regional Meeting, Oral Presentation. October 21<sup>st</sup>, 2018. Ames, IA.

5. M. GREEN, X. CHEN. "Ferric Metal-Organic Framework for Microwave Absorption." Department of Chemistry Graduate Seminar, Oral Presentation. October 16<sup>th</sup>, 2018. Kansas City, MO.

4. M. GREEN, X. CHEN. "Hydrogenated Titanium Dioxide Nanomaterials for Microwave Absorption." American Chemical Society Midwest Regional Meeting, Extended Feature Oral Presentation. Friday, October 20<sup>th</sup>, 2017. Lawrence, KS.

3. M. GREEN, X. CHEN. "Hydrogenated Titanium Dioxide Nanomaterials for Microwave Absorption." Department of Chemistry Graduate Seminar, Oral Presentation. University of Missouri-Kansas City. Tuesday, October 17<sup>th</sup>, 2017. Kansas City, MO.

2. S. U. NANDANWAR, M. GREEN, K. COLDSNOW, V. UTGIKAR, P. SABHARWALL, D. E. ASTON. "Adsorption of volatile iodine from off-gas stream using ETS-10 supported hollow carbon nanosorbent." American Nuclear Society Winter Conference, Oral Presentation. Thursday November 12<sup>th</sup>, 2015. Washington, DC.

1. S.U. NANDANWAR, K. COLDSNOW, M. GREEN, V. UTGIKAR, P. SABHARWALL, D. E. ASTON. "Treatment of Radioactive Contaminants in Off-Gases Using Carbon Supported ETS-10 nanosorbent." American Nuclear Society Winter Conference, Oral Presentation. Wednesday, November 12<sup>th</sup>, 2014. Anaheim, CA.