

Amanda L. Musgrove

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An innovative, adaptable, and knowledgeable chemist with 13 years of combined educational and professional experience conducting research & development into methods for synthesis and characterization of nanomaterials and electrochemical processes.

PROFESSIONAL EXPERIENCE

Oak Ridge National Laboratory, Oak Ridge, TN

August 2023 – Present

R&D Staff

- Development of new materials and processes related to energy storage/conversion applications
- Study of solid-liquid and solid-solid interfaces and their effect on electrochemical properties
- Materials processing, utilization of physical vapor deposition processes to coat vacuum stable materials, and fabrication of battery systems including but not limited to Li- and Na- ion batteries and solid state battery systems
- DOE Q clearance acquisition

Los Alamos National Laboratory, Los Alamos, NM

August 2022 – August 2023

Postdoctoral Research Associate

- Electroanalytical optimization of the deposition and separation process of d- and f-block metals using mercury amalgam electrodes for nuclear and hazardous material recycling as well as isotopic separation applications
- Development of novel electrodeposition techniques using refractory metals in a molten salt flux for nuclear reactor applications
- DOE Q clearance acquisition

Auburn University, Auburn, AL

August 2017 – August 2022

Graduate Research and Laboratory Assistant; Interim Organic Chemistry Labs Coordinator

- Hydrothermal synthetic optimization of delafossite CuCrO_2 while exploring the role of Cr^{III} as a reducing agent through the study of chromate formation
- Structural and elemental characterization of materials using powder x-ray diffraction (pXRD), scanning electron microscopy (SEM), energy-dispersive spectroscopy (EDS), transmission electron microscopy (TEM), thermogravimetric analysis (TGA), and atomic force microscopy (AFM)
- Electrochemical characterization of mesoporous metal oxide thin films using a variety of electroanalytical techniques including cyclic voltammetry, chronocoulometry, chronoamperometry, and electrochemical impedance spectroscopy for energy conversion and storage applications
- Supervisor for undergraduate organic chemistry labs at Auburn University, delegating tasks to graduate teaching assistants while ensuring enrolled students acquired adequate knowledge of lab techniques and safety practices
- Safety officer of graduate research lab; mentoring and supervision of incoming graduate and undergraduate research students

Air Force Research Laboratory, Destin, FL

June 2021 – August 2021

Student Intern

- Using Python and MEEP to develop code and simulate optical behavior of bio-inspired morpho butterfly wing structures and photonic surfaces for application in sensors for gas detection
- Active collaboration and facilitation of proposal submissions with research groups at Eglin Air Force Base and University of Central Florida
- DOD Security clearance acquisition

FullScale NANO Inc., Tallahassee, FL

May 2015 – August 2017

VP Global Support Services

- Consulting and interfacing with clients, both from academia and industry, in support of administrative, scientific, and processing activities
- Characterization of clients' samples including pXRD, SEM, EDS, and TEM analysis in addition to detailed report generation
- Software testing and assistance in development of automated dimensional analysis software for nanomaterials

National High Magnetic Field Laboratory, Tallahassee, FL

June 2013 – August 2016

Research Assistant

- Supervisor and safety manager for training and delegation of lab tasks
- Single crystal synthesis and discovery of complex oxide phases from an alkaline earth molten metal flux
- Magnetism of inorganic crystalline phases

Chemistry Department, FSU, Tallahassee, FL

July 2014 – June 2015

Research Assistant

- Hydrothermal synthesis, structure, spectroscopy, and structure-property correlations in single crystals containing lanthanides and actinides
- X-ray diffraction, spectrophotometric analysis, microscopy, radioactive materials handling

Florida Department of Environmental Protection, Tallahassee, FL

July 2011 – August 2013

Biological Laboratory Technician

- Sample preparation of macroinvertebrates for taxonomic identification
- Sample preparation of algae and cyanobacteria for wet and diatom identification
- Algae transfers and data entry verification

EDUCATION

Auburn University, Auburn, AL Projected Graduation July 22, 2022

- Chemistry Ph.D. candidate
- Advisor: Dr. Byron Farnum

Florida State University, Tallahassee, FL Graduated May 2015

- B.S. in Chemistry with mathematics minor
- Recognition on the Dean's List
- Executive officer of the FSU chemistry organization
- Volunteer and co-operator of chemistry demonstrations through a chemistry outreach program

PUBLICATIONS

- Chown, Amanda; Cockerham, Alex; Shahriar, Shaimum; McMahon, Michael; Touma, James; Kuebler, Stephen. A Review of Bio-Inspired Metal Oxide Photonic and Plasmonic Materials for Gas Sensing Applications. *ACS Sensors*. 2023 (*Currently in preparation for submission*)
- Chown, Amanda; Farnum, Byron. Lithium Dependent Electrochemistry of p-type Delafossite Oxides. *ChemElectroChem*. 2022. 10.1002/celec.202200825 (*Cover Feature*)
- Chown, Amanda; Farnum, Byron. Defining the Role of Cr³⁺ as a Reductant in the Hydrothermal Synthesis of CuCrO₂ Delafossite. *Inorg. Chem*. 2022. 10.1021/acs.inorgchem.2c00943.
- Bredar, Alexandria*, Chown, Amanda*, Burton, Andricus*, Farnum, Byron. Electrochemical Impedance Spectroscopy of Metal Oxide Electrodes for Energy Applications. *ACS Applied Energy Materials*. 2020. 10.1021/acsaem.9b01965.

* *Authors contributed equally to publication*

- Parker, T. G.; Chown, A. L.; Beehler, A.; Pubbi, D.; Cross, J. N.; Albrecht-Schmitt, T. E. Ionothermal Synthesis of Tetranuclear Borate Clusters Containing f- and p-Block Metals. *Inorg. Chem.* 2015. 10.1021/ic502461d.

PRESENTATIONS

- ACS Spring 2022**, San Diego, CA and Virtual **March 2022**
Oral Presentation, Auburn University
 Electrochemical properties of synthetically optimized p-type CuCrO₂
- Auburn Research Student Symposium**, Auburn, AL **March 2022**
Poster Presentation, Auburn University
 Morphological and Electrochemical Properties of CuCrO₂ Exposed to Acidic Environments for Application in Energy Storage Devices
- Southeastern Regional Meeting of ACS**, Birmingham, AL **November 2021**
Oral Presentation, Auburn University
 Physical and electrochemical properties of synthetically optimized p-type CuCrO₂
- Southeastern Regional Meeting of ACS**, Savannah, GA **October 2019**
Oral Presentation, Auburn University
 Physical and electrochemical properties of copper deficient CuCrO₂ for application in Li-ion batteries
- This is Research Student Symposium**, Auburn, AL **March 2019**
Poster Presentation, Auburn University
 Physical and electrochemical properties of copper deficient CuCrO₂ for application in Li-ion batteries
- National Defense Innovation Summit**, Houston, TX **October 2017**
Exhibitor, FullscaleNANO Inc.
 Demonstration of automated dimensional analysis software for nanomaterials
- Tallahassee Science Festival**, Tallahassee, FL **September 2016**
Exhibitor, National High Magnetic Field Laboratory
 Demonstration of automated dimensional analysis software for nanomaterials
- TechConnect World Innovation Conference and Expo**, Washington D.C. **May 2016**
Exhibitor, FullscaleNANO Inc.
 Demonstration of automated dimensional analysis software for nanomaterials
- TechConnect Innovation Award
- Digitech**, Tallahassee, FL **March 2016**
Poster Presentation, National High Magnetic Field Laboratory
 Single crystal synthesis and characterization of novel oxide materials
- North American Solid-State Chemistry Conference**, Tallahassee, FL **May 2015**
Poster Presentation, National High Magnetic Field Laboratory
 Synthesis and structure of oxyhalide single crystal growth