

Elizabeth (Betsy) Brown

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SKILLS

- Designed reaction strategies to attach complex molecules to gallium phosphide and silicon surfaces
- Characterized modified semiconductor surfaces with X-ray photoelectron spectroscopy, infrared spectroscopy, and contact angle goniometry
- Evaluated GaP with triarylmethane and cationic iminium dyes using cyclic voltammetry, quantum yield measurements, and electrochemical impedance spectroscopy
- Monitored catalysis products by GCMS instrumentation
- Maintained UHV systems and home-built optics systems
- Communicated science with people of all ages and backgrounds

EDUCATION

University of Michigan, Ann Arbor, MI 2011 - present
PhD (expected April 2016), Materials Chemistry
University of Wisconsin-La Crosse, La Crosse, WI 2007 - 2011
B.S. in Chemistry with Honors (Microbiology Minor); Graduated in *University Honors Program*

RESEARCH EXPERIENCES

Graduate Research: Chemistry Department, University of Michigan 2011 - present
Research Advisor: Professor Stephen Maldonado
Thesis Focus: Heterogeneous Organic Reactions at the Surface of GaP and Si Semiconductors for Photoelectrochemical Stability, Dye Sensitization, and Catalytic Generation of H₂

Undergraduate Research: Chemistry Department, University of Wisconsin-La Crosse 2010 - 2011
Research Advisor: Professor Robert McGaff
Project Focus: Inorganic synthesis of chiral catalysts; iron (III) phthalocyaninato and iron (III) naphthalocyaninato complexes for catalytic conversion of cycloalkane to secondary alcohols

PUBLICATIONS

Ilic, S.; **Brown, E.S.**; Xie, Y.; Maldonado, S.; Glusac, K.D. *In preparation*. Sensitization of p-GaP with Cationic Iminium Dyes: The Effect of Dye Excited-State Lifetime on Hole Injection Efficiencies.
Brown, E.S.; Hlynchuk, S.; Maldonado, S. *Submitted*. Chemically Modified Si(111) Surfaces Demonstrating Strong Hydrophilicity, Resistance Against Oxidation, and Low Trap State Densities.
Wang, Z.; **Brown, E.S.**; Maldonado, S. Hybrid solar cells constructed of macroporous n-type GaP coated with PEDOT:PSS. *Chin. Chem. Lett.*, **2015**, *26*, 469-473
Brown, E.S.; Peczonczyk, S.L.; Maldonado, S. Wet Chemical Functionalization of GaP(111)B Through Williamson Ether-Type Reaction. *J. Phys. Chem. C*, **2015**, *119* (3), 1338-1345
Brown, E.S.; Peczonczyk, S.L.; Wang, Z.; Maldonado, S. Photoelectrochemical Properties of CH₃-Terminated p-type GaP(111)A. *J. Phys. Chem. C*, **2014**, *118* (22), 11593-11600
Peczonczyk, S.L.; **Brown, E.S.**; Maldonado, S. Secondary Functionalization of Allyl-Terminated GaP(111)A Surfaces *via* Heck Cross Coupling Metathesis, Hydrosilylation, and Electrophilic Addition of Bromine. *Langmuir*, **2014**, *30* (1), 156-164
Brown, E. S.; Robinson, J. R.; McCoy, A. M.; McGaff, R. W. Efficient catalytic cycloalkane oxidation employing a “helmet” phthalocyaninato iron(III) complex. *Dalton Trans.* **2011**, *40* (22), 5921-5925

Elizabeth (Betsy) Brown (cont.)

HONORS AND AWARDS

Susan Lipschutz Award, U of M Rackham Graduate School	2015
Honorable Mention, NSF Graduate Student Fellowship Program	2011 and 2012
Outstanding Student of the Year in Physical Chemistry, UW-La Crosse	2011
ACS Outstanding Student of the Year Award, Winona-La Crosse Chapter	2011
Dean's Distinguished Fellowship for Research, UW-La Crosse	2010
Madalynne Laux Scholarship	2007
Dean's List, UW-La Crosse	2007 - 2011
Eta Phi Alpha Honors Society, UW-La Crosse	2007 - 2011

PRESENTATION HIGHLIGHTS

249 th ACS National Meeting, Denver, CO	March 2015
<ul style="list-style-type: none">• <i>Photoelectrochemical Properties of p-Type GaP(111)A After Deliberate Surface Chemisorption</i>• <i>Chemisorption of Polycyclic Molecules to GaP(111)A Functionalized with Single Layer Graphene Probed with X-ray Photoelectron, Raman, and Infrared Spectroscopies</i> (poster)	
247 th ACS National Meeting, Dallas, TX	March 2014
<ul style="list-style-type: none">• <i>Surface Modification Strategies for GaP(111)A and GaP(111)B Surfaces by X-ray Photoelectron and Infrared Spectroscopy and Spectral Response</i>• <i>Williamson Ether-type Reaction of Hydroxyl-Terminated GaP(111)B Surfaces with Alkyl and Benzyl Bromides Characterized by X-ray Photoelectron and Infrared Spectroscopy</i> (poster)	
Central Regional Meeting of ACS, Mount Pleasant, MI	May 2013
<ul style="list-style-type: none">• <i>X-ray and Vibrational Spectroscopy of Alkyl Groups Covalently Bound to Gallium Phosphide (111)B</i> (poster)	

LEADERSHIP ROLES

<i>Vice President</i> , Females Excelling More in Math, Engineering, and Science (FEMMES), 2014-2015	
<ul style="list-style-type: none">• Secured support of \$1000 (U of M Chemistry Dept.) and \$4000 (Comerica Bank)• Independently organized three events at the Ann Arbor and Ypsilanti District Libraries• Managed three subcommittees and co-directed two Saturday Science Capstones	
<i>Social Media Director</i> , U of M Karle Symposium Committee	2014 - present
<i>Research mentor</i> of undergraduate and graduate students	2014 - present
<i>Safety Monitor</i>	2012 - present

TEACHING EXPERIENCES

<i>Graduate Student Instructor (GSI)</i> , general chemistry discussion leader	2011 - 2013
<i>GSI</i> , physical chemistry discussion leader	2013
<i>Graduate Student Mentor</i> , manager of general chemistry GSIs	2012
<i>Tutor</i> , general chemistry	2013 - present

OUTREACH HIGHLIGHTS

Co-leader of a week-long Chemistry Focus Project for middle school girls learning college-level laboratory practices through WISE	2014 and 2015
Activity leader at FEMMES Saturday Science Capstones and after-school events	2012 - present
Activity leader at Society of Women in Physics Annual Girl Scouts Day, U of M	2012 - 2013
Laboratory attendant for Detroit 8 th graders in Future Undergraduates in Energy Laboratories (FUEL) Workshop Series, U of M	Spring 2012
Solar energy discussions at Greenhills School Science Club Meetings, Ann Arbor	2012 - 2013