

# Brandon Wood

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CONTACT INFORMATION	1930 Vine St. Apt. 305 Berkeley, CA 94709 USA	<i>phone:</i> (715) 505-8447 <i>e-mail:</i> <a href="mailto:b.wood@berkeley.edu">b.wood@berkeley.edu</a>
SUMMARY	Ph.D. candidate at UC Berkeley exploring opportunities related to computational chemistry.	
EDUCATION	<b>Ph.D. Candidate - University of California, Berkeley</b>	<b>2013 - Present</b>
	Graduate Program in <a href="#">Applied Science and Technology</a> , <i>GPA: 3.6</i> Emphasis Areas: Physical Chemistry, Physics, Materials Science Relevant Coursework: Statistical Mechanics, Quantum Mechanics, Thermodynamics, Polymer Physics, Computational Materials Science Advisor: Prof. Kristin A. Persson	
	<b>M.S. - University of Minnesota</b>	<b>2010 - 2012</b>
	Microbial Engineering, <i>GPA: 3.9</i> Advisor: Adjunct Prof. Ken Valentas	
	<b>B.S. - University of Minnesota Duluth</b>	<b>2005 - 2009</b>
	Biology with Chemistry Minor, <i>GPA: 3.9</i> Degree Honor: Magna Cum Laude	
SKILLS	<ul style="list-style-type: none"><li>• Simulation and modeling of molecules and materials: <a href="#">Code</a></li><li>• High-throughput quantum calculations: <a href="#">Code</a></li><li>• Open-source collaborative programming: <a href="#">Code</a></li><li>• Machine learning: <a href="#">Code</a></li><li>• Programming Languages: Python, C++, Mathematica</li><li>• Python Packages: NumPy, SciPy, Pandas, Jupyter, scikit-learn, Keras, TensorFlow</li></ul>	
RESEARCH EXPERIENCE	<b>Persson Group, Lawrence Berkeley National Lab</b>	<b>2014 - Present</b>
	<i>Graduate Student Researcher, PI: Kristin A. Persson</i> Quantum calculations and molecular modeling of ion and electron conducting polymers for electrochemical applications. <ul style="list-style-type: none"><li>• Modeling conjugated polymer structure as a function of doping and excitation</li><li>• Atomistic molecular dynamics simulations of polymer electrolytes</li><li>• Development of high-throughput framework for quantum calculations</li></ul>	
	<b>Doyle Group, University of California Berkeley</b>	<b>2013 - 2014</b>
	<i>Graduate Student Researcher, PI: Fiona Doyle</i> Conducted experimental research on electrochemical double layer capacitors. <ul style="list-style-type: none"><li>• Characterized size, shape, surface area, and pore distribution of a variety of carbon materials</li><li>• Fabricated and electrochemically characterized pouch cell capacitors</li></ul>	
	<b>Valentas Group, University of Minnesota</b>	<b>2010 - 2012</b>
	<i>Graduate Research Assistant, PI: Ken Valentas</i>	

Developed a low temperature thermochemical process in combination with anaerobic digestion to treat a liquid waste stream from the corn ethanol industry.

- Operation and analysis of thermochemical and anaerobic digestion experiments
- Statistical design of experiments to optimize thermochemical process

## PROFESSIONAL EXPERIENCE

### Biotechnology Institute, University of Minnesota

2012 - 2013

#### *Assistant Scientist*

Explored properties and potential applications of carbon material (hydrochar) generated from thermochemical treatment of waste streams

- Tested the utility of hydrochar materials for uses as additives, filters, sorbents, and electrodes
- Communicated with academic and industrial partners

### Biogenic Reagents, Minneapolis Based Startup

Fall 2012

#### *Consultant*

Aided in design and management of demonstration-scale testing of renewable carbon materials at a coal-fired power plant in Marquette, MI

## PUBLICATIONS

**Wood, B.M.**; Shin, Y.; Persson, K.A.; Torsional and Conformational Changes in Doped and Excited Conjugated Polymers. Submitted. *Preprint available upon request.*

Rajput, N.N.; Seguin, T.J.; **Wood, B.M.**; Qu, X.; Persson, K.A. Elucidating Solvation Structures for Rational Design of Multivalent Electrolytes - A Review. *Top. Curr. Chem.* **2018**, 376, 19, DOI: [10.1007/s41061-018-0195-2](https://doi.org/10.1007/s41061-018-0195-2)

Self, J.; **Wood, B.M.**; Rajput, N.N.; Persson K.A. The Interplay between Salt Association and the Dielectric Properties of Low Permittivity Electrolytes: The Case of LiPF<sub>6</sub> and LiAsF<sub>6</sub> in Dimethyl Carbonate. *J. Phys. Chem. C* **2018**, 122 (4), 19901994, DOI: [10.1021/acs.jpcc.7b11060](https://doi.org/10.1021/acs.jpcc.7b11060)

Mathew, K.; Montoya, J.H.; Faghaninia, A.; Dwarakanath, S.; Aykol, M.; Tang, H.; Chu, I.; Smidt, T.; Bocklund, B.; Horton, M.; Dagdelen, J.; **Wood, B.**; Liu, Z.; Neaton, J.; Ong, S.P.; Persson, K.; Jain, A. Atomate: A high-level interface to generate, execute, and analyze computational materials science workflows. *Comput. Mater. Sci.* **2017**, 139, 140-152 DOI: [10.1016/j.commatsci.2017.07.030](https://doi.org/10.1016/j.commatsci.2017.07.030)

Delgado, P.A.; Brutman, J.P.; Masica, K.; Molde, J.; **Wood, B.M.**; Hillmyer, M.A. High Surface Area Carbon Black (BP-2000) as a Reinforcing Agent for Poly[(2)-lactide]. *J. Appl. Polym. Sci.* **2016**, 133 (45), 43926 DOI: [10.1002/app.43926](https://doi.org/10.1002/app.43926)

Vozhdayev, G.V.; Spokas, K.A.; Molde, J.S.; Heilmann, S.M.; **Wood, B.M.**; Valentas, K.J. Response of Maize Germination and Growth to Hydrothermal Carbonization Filtrate Type and Amount. *Plant Soil* **2015**, 396, 127136 DOI: [10.1007/s11104-015-2577-3](https://doi.org/10.1007/s11104-015-2577-3)

Heilmann, S.M.; Molde, J.S.; Timler, J.G.; **Wood, B.M.**; Mikula, A.L.; Vozdayev, G.V.; Colosky, E.C.; Spokas, K.A.; Valentas, K.J. 2014. Phosphorus Reclamation through Hydrothermal Carbonization of Animal Manures. *Environ. Sci. Technol.* **2014**, 48, 1032310328 DOI: [10.1021/es501872k](https://doi.org/10.1021/es501872k)

**Wood, B.M.**; Jade, L.R.; Schendel, F.J.; Hahn, N.J.; Valentas, K.J.; McNamara, P.J.; Novak, P.J.; Heilmann, S.M. Industrial Symbiosis: Corn Ethanol Fermentation, Hydrothermal Carbonization,

and Anaerobic Digestion. *Biotechnol. Bioeng.* **2013**, 110 (10), 2624-2632 DOI: [10.1002/bit.24924](https://doi.org/10.1002/bit.24924)

PATENTS

Schendel, F.J.; Keitz, M.V.; Valentas, K.J.; Heilmann, S.M.; Jader, L.R.; **Wood, B.M.** Methods of producing coal and fertilizers from fermentation residues, US Patent Application US 13/967,523, filed August 2013

Heilmann, S.M.; Schendel F.J.; Von Keitz, M.G.; Valentas, K.J.; Mikula, A.L.; **Wood, B.M.** Hydrothermal carbonization of sewage wastes. US Patent Application PCT/US2013/029842, filed March 2013

CONFERENCE  
PRESENTATIONS

**Wood, B.M.**; Shin, Y.; Persson, K.A. Modeling Chain Configurations of Conjugated Polymers as a Function of Charge Concentration. American Physical Society March Meeting 2017 New Orleans, LA.

**Wood, B.M.**; Shin, Y.; Persson, K.A. Modeling Chain Configurations of Conjugated Polymers. Berkeley Statistical Mechanics Meeting 2017 Berkeley, CA.

**Wood, B.M.**; Mathew, K.; Persson, K.A. Developing Computational Resources for the Study of Multivalent Polymer Electrolyte Systems. Polymer Physics Gordon Conference 2016 Mount Holyoke College in South Hadley, MA.

ACTIVITIES

[Earth Action Initiative](#)

**2016 - 2018**

Berkeley Students for Environmental and Energy Development

**2013 - 2016**

University of Minnesota Duluth Football

**2005 - 2009**