

Siobhan Brown
(she / her)
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ACADEMIC EXPERIENCE

Postdoctoral Scholar, Northwestern University 05/2023 – Present
Studying early transition metal nitrides and carbides for CO₂ reduction, and nitride overlayer catalysts for Haber-Bosch ammonia synthesis.
(Joint Appointment in the Notestein Lab and the Center for Catalysis and Surface Science)
PhD Candidate, West Virginia University, Morgantown, WV 09/2021 – 05/2023
PhD Student, West Virginia University, Morgantown, WV 08/2018- 09/2021

EDUCATION

West Virginia University, Morgantown WV Defended 03/2023
Doctor of Philosophy in Chemical Engineering (Advised by Dr. Jianli Hu)
“Ambient ammonia synthesis via microwave-catalytic materials and plasma chemistry”
Certificate in University Teaching
Engineer in Training (EIT), PA 2015
West Virginia University, Morgantown WV 05/2014

FIRST AUTHOR PUBLICATIONS

1. **Brown, S.**, Hu, J., “*Review of Chemical Looping Ammonia Synthesis Materials*” Chemical Engineering Science 2023, 119063.
2. **Brown, S.**, Ibrahim, S. A., Robinson, B. R., Caiola, A., Tiwari, S., Wang, Y., Bhattacharyya, D., Che, F., Hu, J. “*Ambient Carbon-Neutral Ammonia Generation via a Cyclic Microwave Plasma Process*” ACS Applied Materials & Interfaces 2023, 15, 19, 23255–23264.
<https://doi.org/10.1021/acscami.3c02508>.
3. **Brown, S.**, “*Vector Network Analysis of Powdered Materials Guide*” Zenodo April 27th, 2023. <https://doi.org/10.5281/zenodo.7595964>.
4. **Brown, S.**, Robinson, B., Wang, Y., Wildfire, C., Hu, J. “*Microwave heated chemical looping ammonia synthesis over Fe and CoMo particles*”, RSC Journal of Materials Chemistry A, 2022, <https://doi.org/10.1039/D2TA03241D>.
5. **Brown, S.**, Ellison, C., Shekhawat, D., Hu, J. “*Chemical Looping Ammonia Synthesis: Microwave and Thermal Fixed Bed Systems*”, Conference Proceedings of the International Microwave Power Institute, Annual Microwave Power Symposium 56, Savannah, GA, 2022
6. **Brown, S.**, Jiang, C., Wang, Q., Caiola, A., Hu, J. “*Evidence of Ammonia Synthesis by Bulk Diffusion in Cobalt Molybdenum Particles in a CLAS Process*”, Catalysis Communications 2022, 106438. <https://doi.org/10.1016/j.catcom.2022.106438>.

SUPPORTING AUTHOR PUBLICATIONS

1. Caiola, A.; Robinson, B.; **Brown, S.**; Wang, X.; Wang, Y.; Hu, J. "Oxidative Ethane Dehydrogenation under Thermal vs. Microwave Heating over Ga/ZSM-5 and GaPt/ZSM-5" *Catalysis Communications* 2023, 176, 106631.
<https://doi.org/10.1016/j.catcom.2023.106631>.
2. Araia, A., Wang, Y., Jiang, C., **Brown, S.**, Caiola, A., Robinson, B., Hu, J., "Intuitive study on the effect of support morphology over Cs-Ru/CeO₂ catalyst for microwave-initiated ammonia synthesis" *Catalysis Communications*, October 27th, 2022.
<https://doi.org/10.1016/j.catcom.2022.106551>.
3. Aira, A. Wang, Y., Robinson, B., Jiang, C., Wildfire, C., **Brown, S.**, Hu, J. "Microwave-assisted ammonia synthesis over Cs-Ru/CeO₂ catalyst at ambient pressure: Effect of metal loading and support particle size" *Catalysis Communications* 2022,
<https://doi.org/10.1016/j.catcom.2022.106491>.
4. Hu, J., **Brown, S.**, Tiwari, S., Wang, Y., Robinson, B., "Methods and compositions for chemical looping ammonia synthesis at low pressure", Provisional Patent, US Application No. 63/313,672, 63/358,516, International Application No. PCT/US23/13868, February 24th, 2022.

ORAL PRESENTATIONS

1. **Brown, S.**, "Plasma-Enhanced Chemical Looping Ammonia Synthesis", Oral presentation at the C3S Conference. Northwestern University, July 19th, 2023.
2. **Brown, S.**, Robinson, B., Ibrahim, S. A., Che, F., Hu, J. "Plasma-Enhanced Chemical Looping Ammonia Synthesis over Bifunctional Catalysts", Oral presentation at North American Catalysis Society Conference, Providence, RI, June 20th, 2023.
3. **Brown, S.**, Hu, J., "Plasma-enhanced chemical looping ammonia synthesis", Oral presentation at the AIChE Annual Conference, Phoenix, AZ, November 14th, 2022.
4. **Brown, S.**, Hu, J. "Chemical looping ammonia synthesis: microwave and thermal fixed bed systems", Poster presentation at International Microwave Power Institute, Savannah, GA, June 14th-16th, 2022.
5. **Brown, S.**, Hu, J. "Next generation catalysis by microwave, plasma, and materials design", Oral presentation at CHMJC, Virtual, June 8th, 2022.
6. **Brown, S.**, Hu, J. "Kinetic study of chemical looping ammonia synthesis candidates: Manganese nitride as a model material", Oral presentation at American Chemical Society Spring Conference, San Diego, CA, March 20th, 2022.
7. **Brown, S.**, Wang, Y., Hu, J. "Chemical Looping Synthesis of Ammonia over Cobalt Molybdenum Nitride: Effects of Surface Hydrogen on Productivity", Oral presentation at the AIChE Annual Conference, Boston, MA, November 10th, 2021.

POSTER PRESENTATIONS

1. Tiwari, S., Ibrahim, S. A., Robinson, B., **Brown, S.**, Che, F., Hu, J. "Selectivity Modulated by Post-Plasma Species-Catalyst Interactions: Mechanism of CH₄/N₂ Conversion to Ammonia

- and Ethylene*", Poster presentation at North American Catalysis Society Conference, Providence, RI, June 20th, 2023.
2. Araia, A., Wang, Y., Robinson, B., Jiang, C., Caiola, A., **Brown, S.**, Hu, J., "*Microwave Assisted Ammonia Synthesis*", Poster presentation at WVU Statler Research Day, Morgantown, WV, March 24th, 2023
 3. **Brown, S.**, "*Ambient Ammonia Synthesis via Cyclic Microwave-Enhanced Catalytic Processes*", Poster presentation at WVU Statler Research Day, Morgantown, WV, March 24th, 2023
 4. **Brown, S.**, Hu, J. "*Chemical looping ammonia synthesis by thermal, microwave, and plasma*", Poster presentation at WIC session, AIChE Annual Conference, Phoenix, AZ, November 15th, 2022.
 5. **Brown, S.**, Hu, J. "*Microwave and plasma enhanced catalysis for chemical looping ammonia synthesis*", Poster presentation at the AIChE Annual Conference, Phoenix, AZ, November 14th, 2022.
 6. **Brown, S.**, Hu, J. "*Next Generation Catalysis by Microwave, Plasma, and Materials Design*", Faculty/postdoc poster presentation at the AIChE Annual Conference, Phoenix, AZ, November 13th, 2022.
 7. **Brown, S.**, Hu, J. "*Chemical looping ammonia synthesis: thermal, microwave, and plasma approaches*", Poster presentation at the American Chemical Society Fall Conference, Chicago, IL, August 24th, 2022.
 8. **Brown, S.**, Ellison, C., Shekhawat, D., Hu, J. "*Chemical looping ammonia synthesis: microwave and thermal fixed bed systems*", Poster presentation at International Microwave Power Institute, Savannah, GA, June 14th-16th, 2022.
 9. **Brown, S.**, Hu, J. "*Chemical Looping Ammonia Synthesis: Thermal, Microwave, and Plasma Approaches*", Poster presentation at WVU Graduate Student Research Symposium, Morgantown, WV, April 12th, 2022
 10. Caiola, A.; Robinson, B.; **Brown, S.**, Hu, J. "*Ethane Dehydroaromatization Using Molybdenum Promoted Microwave Synthesized Zeolites*", Poster presentation at the WVU Graduate Student Research Symposium, Morgantown, WV, April 12th, 2022
 11. **Brown, S.**, Robinson, B., Wang, Y., Wang, Q., Hu, J. "*Thermal & Microwave Assisted Synthesis of Ammonia with a Chemical Looping Approach*", Poster presentation at the AIChE Annual Conference, virtual, November 16th-20th, 2020.
 12. **Brown, S.**, Robinson, B., Wang, Y., Wang, Q., Hu, J. "*Thermal & Microwave Assisted Synthesis of Ammonia with a Chemical Looping Approach*", Poster presentation at the AIChE Annual Conference, virtual, November 16th-20th, 2020.
 13. Bai, et. al. "*Catalytic Dehydroaromatization of Ethane in Microwave Reactor*", Poster presentation at STARS: Students, Teachers, And Researchers Conference, Morgantown WV, November 16th, 2019.

AWARDS AND SCHOLARSHIPS

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| 1. North American Catalysis Society (NAM 28) Kokes Award | 02/2023 |
| 2. AIChE Women in Chemical Engineering (WIC) Travel Award | 11/2022 |

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| 3. IMPI 56 th Annual Microwave Power Symposium Student Travel Award | 06/2022 |
| 4. IMPI 56 th Annual Microwave Power Symposium Best Student Poster | 07/2022 |
| 5. Queer Engineer Scholarship for Trans+ Students in STEM | 03/2022 |
| 6. Willard H. Hodge Award in Chemical Engineering | 2013 – 2014 |
| 7. West Virginia University Blue and Gold Scholarship | 2009 – 2014 |

PROFESSIONAL EXPERIENCE

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| Application Engineer , Equipment & Controls, Inc., Pittsburgh, PA | 08/2015 - 08/2018 |
| Chemist , Mylan, N. V., Morgantown, WV | 04/2015 - 09/2015 |
| Chemical Engineer , Goodyear Tire & Rubber, Co., Danville, VA | 06/2014 – 09/2014 |

TEACHING EXPERIENCE

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| Incoming PhD Review , Kinetics and Thermodynamics (Northwestern) | Fall 2023 |
| Instructor , Unit Operations II (WVU CHE 451) | Spring, 2020 |
| Guest Lecturer , Thermodynamics (WVU CHE 320) | Fall, 2021 |
| Teaching Assistant , Unit Operations I & II (WVU CHE 450 & CHE 451) | 2018 – 2021 |
| Teaching Assistant , Chemical Process Design I (WVU CHE 455) | Spring, 2019 |
| Teaching Assistant , Transport Phenomena (WVU CHE 325) | Spring, 2014 |

OUTREACH

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| Secretary , Graduate Student Organization (CBE Department, WVU) | 2021-2022 |
| Member , Graduate Womxn in CBE (CBE Department, WVU) | 2020-2022 |
| Member , DEI Committee (CBE Department, WVU) | 2021-2022 |
| Member , DEI Committee (Statler College of Engineering, WVU) | 2021-2022 |
| Volunteer , WVU Undergraduate Research Day | 2021-2022 |
| Coordinator , Transitions WV (WV, statewide) | 2020-2022 |
| Volunteer , Appalachian Prison Book Project (Morgantown, WV) | 2019-2020 |
| Volunteer , West Virginia Family Grief Center (Morgantown, WV) | 2016-2017 |

PROFESSIONAL SOCIETIES

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| Member , The American Chemical Society (ACS)
Catalysis Division | 2019-2024 |
| Member , The American Institute of Chemical Engineers (AIChE)
Chemical Reaction Engineering Division | 2018-2024 |
| Member , The International Microwave Power Institute (IMPI) | 2020-2024 |