

Dr. Stephen Chmely

Curriculum Vitae

Updated: September 13, 2022

The Pennsylvania State University
AG - Agricultural and Biological Engineering
225 Agricultural Engineering Building
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Education

- Ph D, Vanderbilt University, Nashville, TN, USA, 2010.
Major: Chemistry
Dissertation Title: Sterically Demanding Ligands and Their Effect on the Structure and Reactivity of Main Group Metal Complexes
- BS, Western Kentucky University, Bowling Green, KY, USA, 2006.
Major: Chemistry
Supporting Areas of Emphasis: Physics
- AA, Volunteer State Community College, Gallatin, TN, USA, 2003.
Major: Chemistry

Professional Positions

Academic

- Affiliate Assistant Professor, Auburn University School of Forestry and Wildlife Sciences.
(January 12, 2021 - Present).
Courtesy appointment in the School of Forestry and Wildlife Sciences to serve on graduate committees of students.
- Research Assistant Professor, University of Tennessee Institute of Agriculture. (2013 - July 31, 2019).
Principal investigator studying lignocellulosic biomass conversion to afford new products
- Postdoctoral Research Associate, National Renewable Energy Laboratory (Alliance for Sustainable Energy). (2011 - 2013).
Postdoctoral training in lignin conversion and catalysis in Gregg T. Beckham's laboratory
- Postdoctoral Research Associate, Vanderbilt University Medical Center. (2010 - 2011).
Postdoctoral training in CYP-450 enzymatic conversion of dihydrotestosterone in F. Peter Guengerich's laboratory

Professional Memberships

- American Society of Agricultural and Biological Engineers. (2020 - Present).
- Alpha Epsilon (Omicron Chapter). (2019 - Present).
A scholastic honor society recognizing academic achievement among students in the fields of Agricultural, Food, and Biological Engineering
- American Chemical Society. (2003 - Present).

TEACHING

Teaching Experience

Penn State

ABE 600, Thesis Research, 3 courses
BRS 300, Intr Biorenew Prod, 1 course
BRS 411, Bioproducts Science Technology, 5 courses
BRS 417, Process Manufacturing Bioprod, 1 course
BRS 423, Deterior and Protect, 1 course
BRS 496, Indep Studies, 1 course
BRS 501, Biobased Polymers, 2 courses
BRS 596, Individual Studies, 1 course
BRS 600, Thesis Research, 5 courses

Non-Credit Instruction

Guest Lecture, Guest Lecturer, BE 1, Growing Your Future--First-Year Seminar, Internal to Penn State, Academic. Fall (2019 - Present).

Lab activity for a focus area of ABE research for BE 1 First-year Seminar. I developed an activity on vacuum pyrolysis which the students recorded to create a video project about research in ABE.

Directed Student Learning

Anthony Abshire, Ph.D. Dissertation Committee (2019 - Present).

Nipuna Agampodi, Ph.D. Dissertation Committee (2022 - Present). Ph.D. Dissertation Committee (2022 - Present).

Benjamin Aronson, Research Activity (2020).

Aditi Arya, Master's Thesis Committee (2020 - August 2021).

Noah Babik, Research Activity (2020).

Jonah Babusci, Research Activity (2019 - Present).

Saman Barzegari, Ph.D. Dissertation Committee (August 2019 - October 2019).

Evan Battisto, Master's Thesis Committee (2020 - April 2022).

Senayit Berhane, Internship (March 2022 - Present).

Kelly Chege, Ph.D. Dissertation Committee (2019).

James Godwin, Ph.D. Dissertation Committee (January 2021 - Present).

Javier Hernandez Diaz, Ph.D. Dissertation Committee (2021 - Present).

Hisaaki Ishihara, Master's Thesis Committee (August 2019 - 2021).

Wei-Shu Lin, Ph.D. Dissertation Committee (2020 - Present).

Alexandra Lynott, Research Activity (2020).

Nicholas Moose, Research Activity (2020 - 2021).

Yanyu Mu, Ph.D. Dissertation Committee (2022 - Present).

Parisa Nazemi, Ph.D. Dissertation Committee (2021 - Present).

Lia Novak, Research Activity (2020 - Present).

Sean Okonsky, Ph.D. Dissertation Committee (2021 - Present).

Barbara Perez, Ph.D. Dissertation Committee (2022 - Present).

Mostafa Rohi Gal, Ph.D. Dissertation Committee (August 2021 - Present).

Shea Sarsfield, Research Activity (2022 - Present).

Yajie Wu, Ph.D. Dissertation Committee (2021 - Present).

RESEARCH

Intellectual Contributions

Articles Published in Refereed Journals

- García-Negrón, V., Chmely, S. C., Ilavsky, J., Keffer, D. J., & Harper, D. P. (2022). Development of Nanocrystalline Graphite from Lignin Sources. *ACS Sustainable Chemistry and Engineering*. DOI: 10.1021/acssuschemeng.1c05969
- Sutton, J. T., Rajan, K., Harper, D. P., & Chmely, S. (2021). Improving UV Curing in Lignin-Containing Photopolymers for Stereolithography by Chemical Reduction and Acetylation. *Polymers*, 13(20), 3473. DOI: 10.3390/polym13203473
- Ebers, L. S., Arya, A., Bowland, C. C., Glasser, W. G., Chmely, S., Naskar, A. K., & Laborie, M. P. (2021). 3D printing of lignin- Challenges, opportunities and roads onward. *Biopolymers*, 112, e23431. DOI: 10.1002/bip.23431
- Wang, J., Rajan, K., Annamraju, A., Chmely, S., Pingali, S. V., Carrier, D. J., & Labbe, N. (2021). A Sequential Autohydrolysis-Ionic Liquid Fractionation Process for High Quality Lignin Production. *Energy & Fuels*, 35(3), 2293–2302. DOI: 10.1021/acs.energyfuels.0c03849
- Zhang, L., Lyu, S., Zhang, Q., Chmely, S. (Co-Author), Wu, Y., Melcher, C., Rajan, K., Harper, D. P., Wang, S., & Chen, Z. (2020). Recycling hot-water extractions of lignocellulosic biomass in bio-refinery for synthesis of carbon nanoparticles with amplified luminescence and its application in temperature sensing. *Industrial Crops and Products*, 145, 112066. ISBN/ISSN: 10.1016/j.indcrop.2019.112066
- Annamraju, A., Smith, N. D., Petridis, L., O'Neill, H., Pingali, S. V., Chmely, S. (Co-Author), & Labbé, N. (2019). Insight into molecular-level interactions between imidazolium-based ionic liquids and cellulose combining NMR, SAXS and MD simulations. *Acta Crystallography(A75)*, a268.

- Speight, I. R., Chmely, S. (Co-Author), Hanusa, T. P., & Rheingold, A. L. (2019). Mechanochemically directed metathesis in group 2 chemistry: calcium amide formation without solvent. *Chemical Communications*, 55(15), 2202-2205. ISBN/ISSN: 10.1039/C8CC10155H
- Zhang, L., Lyu, S., Zhang, Q., Wu, Y., Melcher, C., Chmely, S. (Co-Author), Chen, Z., & Wang, S. (2019). Dual-emitting film with cellulose nanocrystal-assisted carbon dots grafted SrAl₂O₄, Eu²⁺, Dy³⁺ phosphors for temperature sensing. *Carbohydrate Polymers*, 206, 767-777. ISBN/ISSN: 10.1016/j.carbpol.2018.11.031
- Edmunds, C. W., Mukarakate, C., Xu, M., Regmi, Y. N., Hamilton, C., Schaidle, J. A., Labbé, N., & Chmely, S. (Co-Author) (2019). Vapor-phase Stabilization of Biomass Pyrolysis Vapors Using Mixed-metal Oxide Catalysts. *ACS Sustainable Chemistry & Engineering*, 7, 7386-7394. ISBN/ISSN: 10.1021/acssuschemeng.9b00649
- Liu, Q., Labbé, N., Adhikari, S., Chmely, S. (Co-Author), & Abdoulmoumine, N. (2018). Hot water extraction as a pretreatment for reducing syngas inorganics impurities--A parametric investigation on switchgrass and loblolly pine bark. *Fuel*, 220, 177-184. ISBN/ISSN: 10.1016/j.fuel.2018.01.108
- Sutton, J. T., Rajan, K., Harper, D. P., & Chmely, S. (Co-Author) (2018). Lignin-containing photoactive resins for 3D printing by stereolithography. *ACS Applied Materials & Interfaces*, 10(42), 36456-36463. ISBN/ISSN: 10.1021/acscami.8b13031
- Moyer, P., Smith, M. D., Abdoulmoumine, N., Chmely, S. (Co-Author), Smith, J. C., Petridis, L., & Labbé, N. (2018). Relationship between lignocellulosic biomass dissolution and physicochemical properties of ionic liquids composed of 3-methylimidazolium cations and carboxylate anions. *Physical Chemistry Chemical Physics*, 20(4), 2508-2516.
- Moyer, P., Kim, K., Abdoulmoumine, N., Chmely, S. (Co-Author), Long, B. K., Carrier, D. J., & Labbé, N. (2018). Structural changes in lignocellulosic biomass during activation with ionic liquids comprising 3-methylimidazolium cations and carboxylate anions. *Biotechnology for Biofuels*, 11(1), 265. ISBN/ISSN: 10.1186/s13068-018-1263-0
- Rajan, K., Mann, J. K., English, E., Harper, D. P., Carrier, D. J., Rials, T. G., Labbé, N., & Chmely, S. (Co-Author) (2018). Sustainable hydrogels based on lignin-methacrylate copolymers with enhanced water retention and tunable material properties. *Biomacromolecules*, 19(7), 2665-2672. ISBN/ISSN: 10.1021/acs.biomac.8b00282
- Regmi, Y. N., Mann, J. K., McBride, J. R., Tao, J., Barnes, C. E., Labbé, N., & Chmely, S. (Co-Author) (2018). Catalytic transfer hydrogenolysis of organosolv lignin using B-containing FeNi alloyed catalysts. *Catalysis Today*, 302, 190-195. ISBN/ISSN: 10.1016/j.cattod.2017.05.051
- Kandhola, G., Rajan, K., Labbé, N., Chmely, S. (Co-Author), Heringer, N., Kim, J.-W., Hood, E. E., & Carrier, D. J. (2017). Beneficial effects of *Trametes versicolor* pretreatment on saccharification and lignin enrichment of organosolv-pretreated pinewood. *RSC Advances*, 7(72), 45652-45661. ISBN/ISSN: 10.1039/C7RA09188E
- Liu, Q., Chmely, S. (Co-Author), & Abdoulmoumine, N. (2017). Biomass treatment strategies for thermochemical conversion. *Energy & Fuels*, 31(4), 3525-3536. ISBN/ISSN: 10.1021/acs.energyfuels.7b00258
- Regmi, Y. N., Roy, A., Goenaga, G. A., McBride, J. R., Rogers, B. R., Zawodzinski, Jr, T. A., Labbé, N., & Chmely, S. (Co-Author) (2017). Electrocatalytic Activity and Stability

- Enhancement through Preferential Deposition of Phosphide on Carbide. *ChemCatChem*, 9(6), 1054-1061. ISBN/ISSN: 10.1002/cctc.201601477
- Haber, H. L., Kim, P., Chmely, S. (Co-Author), Lloyd, J., Regmi, Y. N., Abdoulmoumine, N., & Labbé, N. (2017). Environmentally Friendly Process for Recovery of Wood Preservative from Used Copper Naphthenate-Treated Railroad Ties. *ACS Sustainable Chemistry & Engineering*, 5(11), 10806-10814. ISBN/ISSN: 10.1021/acssuschemeng.7b02760
- Regmi, Y. N., Roy, A., King, L. A., Cullen, D. A., Meyer, III, H. M., Goenaga, G. A., Zawodzinski, Jr, T. A., Labbé, N., & Chmely, S. (Co-Author) (2017). Lattice matched carbide-phosphide composites with superior electrocatalytic activity and stability. *Chemistry of Materials*, 29(21), 9369-9377. ISBN/ISSN: 10.1021/acs.chemmater.7b03377
- Feng, X., Yang, Z., Chmely, S. (Co-Author), Wang, Q., Wang, S., & Xie, Y. (2017). Lignin-coated cellulose nanocrystal filled methacrylate composites prepared via 3D stereolithography printing: Mechanical reinforcement and thermal stabilization. *Carbohydrate polymers*, 169, 272-281. ISBN/ISSN: 10.1016/j.carbpol.2017.04.001
- Regmi, Y. N., Rogers, B. R., Labbé, N., & Chmely, S. (Co-Author) (2017). Scalable and Tunable Carbide-Phosphide Composite Catalyst System for the Thermochemical Conversion of Biomass. *ACS Sustainable Chemistry & Engineering*, 5(9), 7751-7758. ISBN/ISSN: 10.1021/acssuschemeng.7b01223
- Edmunds, C. W., Hamilton, C., Kim, K., Chmely, S. (Co-Author), & Labbé, N. (2017). Using a chelating agent to generate low ash bioenergy feedstock. *Biomass and Bioenergy*, 96, 12-18. ISBN/ISSN: 10.1016/j.biombioe.2016.11.001
Contribution: advised postdoc (Regmi) and u-grad student (Mann); conceived and designed experiments; obtained funding; acquired, analyzed, and interpreted data; provided logistical support; co-wrote, revised, and approved final version of manuscript
- Das, P., Elder, T., Brennessel, W. W., & Chmely, S. (Co-Author) (2016). Iron piano-stool complexes containing NHC ligands outfitted with pendent arms: synthesis, characterization, and screening for catalytic transfer hydrogenation. *RSC Advances*, 6(91), 88050-88056. ISBN/ISSN: 10.1039/C6RA20764B
- Kim, P., Rials, T. G., Labbé, N., & Chmely, S. (Co-Author) (2016). Screening of mixed-metal oxide species for catalytic ex situ vapor-phase deoxygenation of cellulose by py-GC/MS coupled with multivariate analysis. *Energy & Fuels*, 30(4), 3167-3174. ISBN/ISSN: 10.1021/acs.energyfuels.6b00347
- Sturgeon, M. R., O'Brien, M. H., Ciesielski, P. N., Katahira, R., Kruger, J. S., Chmely, S. (Co-Author), Hamlin, J., Lawrence, K., Hunsinger, G. B., Foust, T. D., & others (2014). Lignin depolymerisation by nickel supported layered-double hydroxide catalysts. *Green Chemistry*, 16(2), 824-835. ISBN/ISSN: 10.1039/C3GC42138D
- Boyde, N. C., Chmely, S. (Co-Author), Hanusa, T. P., Rheingold, A. L., & Brennessel, W. W. (2014). Structural Distortions in M [E (SiMe₃)₂]₃ Complexes (M= Group 15, f-Element; E= N, CH): Is Three a Crowd? *Inorganic chemistry*, 53(18), 9703-9714. ISBN/ISSN: 10.1021/ic501232z
- Sturgeon, M. R., Kim, S., Lawrence, K., Paton, R. S., Chmely, S. (Co-Author), Nimlos, M., Foust, T. D., & Beckham, G. T. (2013). A mechanistic investigation of acid-catalyzed cleavage of aryl-ether linkages: implications for lignin depolymerization in acidic environments. *ACS Sustainable Chemistry & Engineering*, 2(3), 472-485. ISBN/ISSN: 10.1021/sc400384w

- Chmely, S. (Co-Author), Kim, S., Ciesielski, P. N., Jiménez-Osés, G., Paton, R. S., & Beckham, G. T. (2013). Mechanistic study of a Ru-Xantphos catalyst for tandem alcohol dehydrogenation and reductive aryl-ether cleavage. *ACS Catalysis*, 3(5), 963-974. ISBN/ISSN: 10.1021/cs400110r
- Kim, S., Chmely, S. (Co-Author), Nimlos, M. R., Bomble, Y. J., Foust, T. D., Paton, R. S., & Beckham, G. T. (2011). Computational study of bond dissociation enthalpies for a large range of native and modified lignins. *The Journal of Physical Chemistry Letters*, 2(22), 2846-2852. ISBN/ISSN: 10.1021/jz201182w
- Chmely, S. (Co-Author), & Hanusa, T. P. (2011). d- and f-Block Transition Metal Complexes with Bulky Allyl Ligands. *Encyclopedia of Inorganic and Bioinorganic Chemistry*. ISBN/ISSN: 10.1002/9781119951438.eibc0279.pub2
- Jochmann, P., Spaniol, T. P., Chmely, S. (Co-Author), Hanusa, T. P., & Okuda, J. (2011). Preparation, structure, and ether cleavage of a mixed hapticity allyl compound of calcium. *Organometallics*, 30(19), 5291-5296. ISBN/ISSN: 10.1021/om200749f
- Williams, K. M., Dudgeon, R. P., Chmely, S. (Co-Author), & Robey, S. R. (2011). Reaction of platinum (II) diamine and triamine complexes with selenomethionine. *Inorganica Chimica Acta*, 368(1), 187-193. ISBN/ISSN: 10.1016/j.ica.2011.01.002
- Chmely, S. (Co-Author), Hanusa, T. P., & Brennessel, W. W. (2010). Bis (1,3-trimethylsilylallyl) beryllium. *Angewandte Chemie International Edition*, 49(34), 5870-5874. ISBN/ISSN: 10.1002/anie.201001866
- Chmely, S. (Co-Author), & Hanusa, T. P. (2010). Complexes with Sterically Bulky Allyl Ligands: Insights into Structure and Bonding. *European Journal of Inorganic Chemistry*, 2010(9), 1321-1337. ISBN/ISSN: 10.1002/ejic.200900813
- Chmely, S. (Co-Author), Hanusa, T. P., & Rheingold, A. L. (2010). Influence of Ring Methylation in Group 15 Tetramethylcyclopentadienyl Complexes, M (C₅Me₄H) n I³⁻ n (M= As, Sb). *Organometallics*, 29(21), 5551-5557. ISBN/ISSN: 10.1021/om100474m
- Chmely, S. (Co-Author), Carlson, C. N., Hanusa, T. P., & Rheingold, A. L. (2009). Classical versus Bridged Allyl Ligands in Magnesium Complexes: The Role of Solvent. *Journal of the American Chemical Society*, 131(18), 6344-6345. ISBN/ISSN: 10.1021/ja900998t
- Johns, A. M., Chmely, S. (Co-Author), & Hanusa, T. P. (2009). Solution Interaction of potassium and calcium bis (trimethylsilyl) amides; preparation of Ca [N (SiMe₃)₂]₂ from dibenzylcalcium. *Inorganic chemistry*, 48(4), 1380-1384. ISBN/ISSN: 10.1021/ic8012766
- Harvey, M. J., Burkey, D. J., Chmely, S. (Co-Author), & Hanusa, T. P. (2009). Stability of cyclopentadienyl aryloxy complexes of calcium and barium. *Journal of Alloys and Compounds*, 488(2), 528-532. ISBN/ISSN: 10.1016/j.jallcom.2008.08.084
- Brady, E. D., Chmely, S. (Co-Author), Jayaratne, K. C., Hanusa, T. P., & Young, Jr, V. G. (2008). s-Block Metal Complexes of the Bis (tetramethylcyclopentadienyl) Phosphonium Diylide [Me (t-Bu) P (C₅Me₄)₂]⁻. *Organometallics*, 27(7), 1612-1616. ISBN/ISSN: 10.1021/om700635c

Articles Published in Nonrefereed Journals

- Battisto, E. W., Sarsfield, S., Lele, S., Williams, T., Catchmark, J. M., & Chmely, S. C. (2022). Enhancing the matrix-fiber interface with a surfactant leads to improved performance properties of 3D printed composite materials containing cellulose nanofibrils. *ChemRxiv*. DOI: 10.26434/chemrxiv-2022-z4k68-v2

Ph.D. Thesis

Chmely, S. (2010). Sterically demanding ligands and their effect on the structure and reactivity of main group metal complexes. Vanderbilt University.

Peer Reviewer of Grant Proposals, Manuscripts, Etc.

ACS Applied Polymer Materials, Reviewer. (2022).
Reviewed 1 article

ACS Sustainable Chemistry and Engineering, Reviewer. (2022).
Reviewed 2 articles

ASABE Applied Engineering in Agriculture, Reviewer. (2022).
Reviewed 1 article

Molecules, Reviewer. (2022).
Reviewed 1 article

Center for the Advancement of Science in Space (CASIS), Reviewer. (May 2022).
Assigned 1 full application to review regarding reimagining the design, production, use, and recovery of polymers to eliminate plastic waste in the environment and reduce the consumption of water, energy, and petrochemical feedstocks.

US Department of Energy, Reviewer. (April 2022).
Assigned 4 Small Business Innovation Research (SBIR) proposals to review

US Department of Energy, Panel Member. (April 2022).
Assigned 7 full applications to review as follow-up to pre-proposals (Jan '22) and participated in a virtual review panel.

Carnegie Mellon University, Ad-hoc Reviewer. (January 2022).
Reviewed a proposal titled "Use of Hemp Materials in Growing Media" for the PA Manufacturing Fellows Initiative at the Carnegie Mellon University College of Engineering

National Science Foundation, Reviewer. (January 2022).
Assigned 12 applications to review

US Department of Energy, Reviewer. (January 2022).
Assigned 12 concept papers to review

ACS Applied Polymer Materials, Reviewer. (2021).
Reviewed 1 article

ACS Omega, Reviewer. (2021).
Reviewed 1 article

ACS Sustainable Chemistry and Engineering, Reviewer. (2021).
Reviewed 2 articles

ASABE Applied Engineering in Agriculture, Reviewer. (2021).
Reviewed 1 article

Biomacromolecules, Reviewer. (2021).

Reviewed 1 article

Dalton Transactions, Reviewer. (2021).
Reviewed 2 articles

Fuel, Reviewer. (2021).
Reviewed 2 articles

Journal of Engineering Materials and Technology, Reviewer. (2021).
Reviewed 1 article

US Department of Energy, Panel Member. (July 2021).
Reviewed 8 full proposals and participated in a virtual 2-day panel review

US Department of Energy, Reviewer. (May 2021).
Assigned 25 concept papers to review

Auburn University, Ad-hoc Reviewer. (April 2021).
Reviewed a proposal titled "Bio-based Polymer Materials for Additive Manufacturing" for the Auburn University Research Support Program

PSU Living Multifunctional Materials Collaborative (LiM2C), Ad-hoc Reviewer. (March 2021).
Reviewed 2 proposal applications

National Science Foundation, Panel Member. (February 2021).
Assigned 6 pre-proposals to review

ACS Applied Polymer Materials, Reviewer. (2020).
Reviewed 2 articles

ACS Sustainable Chemistry and Engineering, Reviewer. (2020).
Reviewed 4 articles

American Society of Agricultural and Biological Engineers, Reviewer. (2020).
Reviewed 1 article

Fuel, Reviewer. (2020).
Reviewed 1 article

US Department of Energy, Panel Member. (August 2020).
Assigned 9 full proposals to review, with follow-up response to reviewer comments after.

National Science Foundation, Panel Member. (May 2020).
Follow-up of 2020 pre-proposal panel review. Was assigned 9 full proposals to review

National Science Foundation, Panel Member. (January 2020).
Panel member, assigned 12 pre-proposals

ACS Applied Polymer Materials, Reviewer. (2019).
Reviewed 1 article

ACS Sustainable Chemistry and Engineering, Reviewer. (2019).
Reviewed 3 articles

Applied Catalysis A, Reviewer. (2019).
Reviewed 1 article

Energy & Fuels, Reviewer. (2019).
Reviewed 2 articles

Industrial Crops and Products, Reviewer. (2019).
Reviewed 1 article

Journal of Applied Polymer Science, Reviewer. (2019).
Reviewed 1 article

New Journal of Chemistry, Reviewer. (2017 - 2019).
Reviewed 2 articles

American Chemical Society, Ad-hoc Reviewer. (2016 - 2019).
Ongoing ad-hoc reviewer, typically review 1 proposal per year

Dalton Transactions, Reviewer. (2016 - 2019).
Reviewed 6 articles

Chemical Science, Reviewer. (2018).
Reviewed 1 article

Journal of Power Sources, Reviewer. (2018).
Reviewed 1 article

Physical Chemistry, Chemical Physics, Reviewer. (2018).
Reviewed 1 article

Polymer, Reviewer. (2018).
Reviewed 1 article

USDA, Panel Member. (2017 - 2018).
Recurring panel member, typically assigned 10-12 proposals to review

ACS Sustainable Chemistry and Engineering, Reviewer. (2015 - 2018).
Reviewed 8 articles

Catalysts, Reviewer. (2017).
Reviewed 1 article

Industrial & Engineering Chemistry Research, Reviewer. (2017).
Reviewed 2 articles

Materials Letters, Reviewer. (2017).
Reviewed 1 article

Research on Chemical Intermediates, Reviewer. (2017).
Reviewed 1 article

Royal Society Open Science, Reviewer. (2017).
Reviewed 1 article

National Science Foundation, Ad-hoc Reviewer. (2016).
Ad-hoc reviewer

National Science Foundation, Ad-hoc Reviewer. (2015).

Ad-hoc reviewer

National Science Foundation, Ad-hoc Reviewer. (2014).
Served as ad-hoc reviewer

USDA/DOT, Panel Member. (2014).
Panel member, reviewed 10 proposals

ACS Catalysis, Reviewer. (2014).
Reviewed 1 article

National Science Foundation, Panel Member. (2013).
Panel member, reviewed 12 grants

American Society of Agricultural and Biological Engineers, Reviewer. (2013).
Reviewed 2 articles

BioEnergy Research, Reviewer. (2013).
Reviewed 1 article

Presentations Given

Godwin, J. A., Babusci, J. P., & Chmely, S. (Co-Author). (July 2022). "Catalytic Depolymerization of Lignin over Metal oxide Catalysts," Northeast Agricultural and Biological Engineering Conference (NABEC), American Society of Agricultural and Biological Engineers, Edgewood, MD, USA.

Rohi, M., Arya, A., & Chmely, S. (Co-Author). (July 2022). "Introduction of Kraft Lignin as an Environmentally Friendly Component for Improving Mechanical Properties of 3D Printing Resins based on Soybean Oil," Northeast Agricultural and Biological Engineering Conference (NABEC), American Society of Agricultural and Biological Engineers, Edgewood, MD, USA.

Chmely, S. (Author and Presenter), Battisto, E. W., & Catchmark, J. M. (June 19, 2022 - June 24, 2022). "Engineered Nanointerfaces to Enable Plant-Inspired 3D Printing Using Renewable Materials," Nanoscale Science and Engineering for Agriculture and Food Systems, Gordon Research Conferences, Manchester, NH, USA.

Chmely, S. (Author and Presenter). (June 19, 2022 - June 24, 2022). "Tuning the nanointerface in nanocellulose-containing multicomponent stereolithography resins using a biobased surfactant affords 3D printed objects with enhanced performance properties," Nanoscale Science and Engineering for Agriculture and Food Systems, Gordon Research Conferences, Manchester, NH, USA.

Chmely, S. (Author and Presenter). (April 14, 2022). "Panel on Advanced Biomaterials," 2022 Biorenewables Symposium on Biorenewables in a Decarbonized Economy, PSU Center for Biorenewables, University Park, PA.

Chmely, S. (Author and Presenter). (April 4, 2022). "Biorefining as America's Newest Frontier," Regional Opportunities for Biomass and Bioproducts Graduate Seminar, The Mid Atlantic Biomass Consortium (MASBio), Live and Online.

Godwin, J. A., Babusci, J. P., & Chmely, S. (Co-Author). (March 2022). "Catalytic depolymerization of CELF Lignin using mixed-metal spinel-group catalysts," ACS Spring 2022, American Chemical Society, San Diego, CA.

- Chmely, S. (Author and Presenter). (November 9, 2021). "Biorefining as America's Newest Frontier," American Institute of Chemical Engineers Rocky Mountain Local Section On-line Meeting, American Institute of Chemical Engineers (AIChE) Rocky Mountain Local Section (RMLS), Live and Online.
- Chmely, S. (Author and Presenter). (October 28, 2021). "Frontiers in Biorefining: Chemicals and Products from Renewable Carbon," Auburn University Biosystems Engineering Fall Seminar Series, Department of Biosystems Engineering, Auburn University, Live and Online.
- Arya, A., & Chmely, S. (Co-Author). (July 2021). "3D printing with Kraft lignin by stereolithography to produce sustainable thermoset materials," Northeast Agricultural and Biological Engineering Conference (NABEC), Live and Online.
- Battisto, E. W., & Chmely, S. (Co-Author). (July 2021). "Use of Cellulose Nanofibrils to Improve the Mechanical Properties of 3D-Printed Composites," Northeast Agricultural and Biological Engineering Conference (NABEC), Live and Online.
- Chmely, S. (Author and Presenter). (July 2021). "3D Printing: Sustainable additive manufacturing and photopolymerizations with lignin," Research Experience for Teachers (RET) Mixer, PSU Center for Nanoscale Science MRSEC, Live and Online.
- Babusci, J., & Chmely, S. (April 2021). "Catalytic Transfer Hydrogenolysis for Sustainable Transformations of Lignin," Annual Spring Meeting of the American Chemical Society, American Chemical Society, Online and Virtual.
- Moose, N., Arya, A., & Chmely, S. (March 23, 2021). "3D Printing Stronger and Tougher Objects with Lignin-containing Resins for Stereolithography," Gamma Sigma Delta Annual Research Expo, Penn State Gamma Sigma Delta, University Park, PA USA.
- Chmely, S. (Author and Presenter). (2020). "3D Printing by stereolithography with biorefinery lignin," 42nd Symposium on Biomaterials, Fuels and Chemicals (cancelled due to COVID), New Orleans, LA.
- Chmely, S. (Author and Presenter). (2020). "Agriculture and the promise of advanced manufacturing: 3D printing with lignin," 2020 Annual International Meeting of the ASABE, Virtual & On-demand.
- Chmely, S. (Author and Presenter). (2020). "Lignin-containing UV curable photopolymers for 3D printing by stereolithography," ACS Spring 2020 National Meeting & Expo (canceled due to COVID), Philadelphia, PA.
- Arya, A., Moose, N., Babik, N., & Chmely, S. (2020). "Biorenewable photoactive resins for sustainable additive manufacturing," Materials Day 2020: Convergence of Materials and Life, Penn State Materials Research Institute, University Park, PA USA.
- Arya, A., Moose, N., & Chmely, S. (Author). (2020). "Sustainable Transformations of Kraft Lignin to Produce Photoactive Polymers," The Future of Bioenergy and Biorenewables, Penn State Center for Biorenewables, University Park, PA USA.
- Battisto, E. W., Aronson, B., & Chmely, S. (2020). "Use of Coated Cellulose Nanomaterials to Enhance the Mechanical Properties of 3D-Printed Biocomposites," The Future of Bioenergy and Biorenewables, Penn State Center for Biorenewables, University Park, PA USA.
- Rajan, K., Mann, J. K., Regmi, Y. N., Harper, D. P., Labbé, N., & Chmely, S. (Author). (2018). "Depolymerized lignin & acrylate-based renewable photopolymers," 255th National Meeting of the American Chemical Society, New Orleans, LA.

- Rajan, K., Harper, D. P., Rials, T. G., Carrier, D. J., Labbé, N., & Chmely, S. (Author). (2018). "Developing renewable and high strength hydrogels by incorporating lignin," 255th National Meeting of the American Chemical Society, New Orleans, LA.
- Chmely, S. (Author and Presenter). (2018). "Sustainable catalytic transformations to produce renewable soft materials," 255th National Meeting of the American Chemical Society, New Orleans, LA.
- Regmi, Y. N., Chmely, S. (Author), & Labbé, N. (2017). "Carbide supported metal phosphide nanocrystalline composite catalysts for selective deoxygenation of lignin model compounds," 253rd National Meeting of the American Chemical Society, San Francisco, San Francisco, CA.
- Regmi, Y. N., Roy, A., King, L. A., Cullen, D. A., Meyer, H. M., Goenaga, G. A., Zawodzinski, T. A., Labbé, N., & Chmely, S. (Author). (2017). "Carbide-phosphide heterostructures for electrochemical water splitting," ORNL Joint Neutron Scattering and Nanoscience User Meeting, Oak Ridge, TN.
- Rajan, K., Chmely, S. (Author), Labbé, N., & Carrier, D. J. (2017). "Novel co-polymers synthesized from biorefinery by-products," 39th Symposium on Biotechnology for Fuels and Chemicals, San Francisco, CA.
- Chmely, S. (Author and Presenter). (2016). "An integrated thermochemical process to valorize lignocellulosic biomass," Berry College "Cheminar" Colloquium Series, Mount Berry, GA.
- Wang, J., Chmely, S. (Author), Rials, T. G., & Labbé, N. (2016). "Biomass fractionation through an ionic liquid process," Symposium on Biotechnology for Fuels and Chemicals, Baltimore, MD.
- Chmely, S. (Author and Presenter). (2016). "Catalyst innovations for value-added chemicals," Joint University of Tennessee-Oak Ridge National Laboratory Technical Exchange Meeting, Oak Ridge, TN.
- Chmely, S. (Author and Presenter), & Regmi, Y. N. (2016). "Catalytic transfer hydrogenolysis of organosolv lignin using NiFeB nano alloys," Frontiers in Biorefining: Chemicals and Products from Renewable Carbon, St Simons Island, GA.
- Chmely, S. (Author and Presenter), Regmi, Y. N., & Ciesielski, P. N. (2016). "Depolymerization and valorization of technical lignin using Ni and Fe boride catalysts," 252nd National Meeting of the American Chemical Society, Philadelphia, PA.
- Regmi, Y. N., & Chmely, S. (Author). (2016). "Nickel phosphide and molybdenum carbide composite materials for biomass upgrading," 252nd National Meeting of the American Chemical Society, Philadelphia, PA.
- Liu, Q., Chmely, S. (Author), Labbé, N., & Abdoulmoumine, N. (2016). "Effect of hot water extraction on inorganics removal in switchgrass," American Institute of Chemical Engineers Knoxville-Oak Ridge Section Local Meet.
- Regmi, Y. N., Chmely, S. (Author), & Labbé, N. (2016). "Exploring transition metal carbides and phosphides for Ex-Situ catalytic fast pyrolysis," American Institute of Chemical Engineers Knoxville-Oak Ridge Section Local Meeting, Knoxville, TN.

- Rajan, K., Kline, L. M., Chmely, S. (Author), Labbé, N., & Carrier, D. J. (2016). "Fractionation and characterization of switchgrass liquid autohydrolyzate," *Frontiers in Biorefining: Chemicals and Products from Renewable Carbon*, St Simons Island, GA.
- Mann, J. K., & Chmely, S. (Author). (2016). "Synthesis, characterization, and catalytic screening reactions of N-heterocyclic carbene-containing iron carbonyl complexes," 251st National Meeting of the American Chemical Society, San Diego, CA.
- Labbé, N., Chmely, S. (Author), Hamilton, C., & Kim, K. (2015). "Inorganics in lignocellulosic biomass," 37th Symposium on Biotechnology for Fuels and Chemicals, San Diego, CA.
- Chmely, S. (Author and Presenter), & Das, P. (2015). "Light-activated iron bifunctional catalysts for transfer hydrogenations of polar double bonds," 249th National Meeting of the American Chemical Society, Denver, CO.
- Chmely, S. (Author and Presenter). (2015). "The integrated biorefinery: chemicals & products from renewable carbon," Farragut High School Seminar Series, Knoxville, TN.
- Chmely, S. (Author and Presenter). (2015). "Thermochemical conversion of biomass to fuels and other products," National Bioenergy Day Webinar Series, Online (from Knoxville, TN).
- Kim, K., Hamilton, C., Chmely, S. (Author), & Labbé, N. (2015). "Reducing inorganics in lignocellulosic biomass utilizing microwave assisted acid extraction," Switchgrass III, Prairie & Native Grass International Conference, Knoxville, TN.
- Das, P., & Chmely, S. (Author). (2014). "Iron-based molecular catalysts for the transfer hydrogenation of carbonyls," 248th National Meeting of the American Chemical Society, San Francisco, CA.
- Das, P., & Chmely, S. (Author). (2014). "Iron-mediated conversion of levulinic acid and formic acid to gamma-valerolactone," 248th National Meeting of the American Chemical Society, San Francisco, CA.
- Greer, C. E., Acado, S., Kim, P., Labbé, N., & Chmely, S. (Author). (2014). "Ex-situ vapor-phase upgrading of pyrolysis vapors using layered double hydroxide catalysts," 248th National Meeting of the American Chemical Society, San Francisco, CA.

Contracts, Grants, and Sponsored Research

Grant

- Chmely, S. (Co-Investigator), Ciolkosz, D. E. (Principal Investigator), Jacobson, M. G. (Co-Investigator), Liu, J. (Co-Investigator), Thomchick, E. A. (Co-Investigator), Wurzbacher, S. (Co-Investigator), Grant, 13% credit, "Mid-Atlantic Sustainable Biomass for Value-added Products Consortium (MASBio)," West Virginia University, Universities and Colleges. Total requested: \$1,445,374.00, Total Anticipated: \$1445374, Amount Funded (Total or To Date, as applicable): \$1445374. (submitted: September 18, 2019, date funding awarded: August 31, 2020, total start and end of funding: September 1, 2020 - August 31, 2025).
- Chmely, S. (Principal Investigator), Grant, 100% credit, "Lignin Based Quantum Dot Composites for Biomedical Applications," University of Tennessee, Universities and Colleges. Total requested: \$91,687.00, Total Anticipated: \$91687, Amount Funded (Total or To Date, as applicable): \$55608. (submitted: September 14, 2020, date funding awarded: May 19, 2021, total start and end of funding: May 1, 2021 - September 14, 2024).

Amendments:

OSP Number: 233103, Total awarded: \$19,330.00. Total anticipated: \$91,687.00. May 1, 2021 - September 14, 2024

Chmely, S. (Co-Principal Investigator), Costello, C. (Co-Principal Investigator), Fathel, S. (Co-Principal Investigator), Heinemann, P. (Co-Principal Investigator), Kumar Chaudhary, A. (Co-Principal Investigator), Mashtare, M. (Co-Principal Investigator), Vasco-Correa, J. (Principal Investigator), Grant, 15% credit, "Training Professionals in Biorenewable Systems for a Sustainable Future," USDA National Institute of Food and Agriculture, Federal Agencies. Total requested: \$150,000.00, Total Anticipated: \$150000, Amount Funded (Total or To Date, as applicable): \$53636. (submitted: March 17, 2021, date funding awarded: August 9, 2021, total start and end of funding: September 1, 2021 - August 31, 2024.

Amendments:

OSP Number: 230515, Total awarded: \$96,364.00. Total anticipated: \$150,000.00. September 1, 2021 - August 31, 2024

Chmely, S. (Principal Investigator), Grant, "Biorenewable Photoactive Resins for Sustainable Advanced Manufacturing," Office of Industrial Partnerships, Penn State. Total requested: \$10,000.00. (submitted: 2019, date funding awarded: 2019.

Chmely, S. (Principal Investigator), Costello, C. (Co-Principal Investigator), Catchmark, J. M. (Co-Principal Investigator), Miller, M. (Co-Principal Investigator), Grant, "Lifecycle Analysis Design Framework for Sustainable Energy Infrastructure," PSU Institutes for Energy and the Environment. Total requested: \$30,000.00, Total Anticipated: \$30000. (submitted: 2019, date funding awarded: 2020.

Chmely, S. (Principal Investigator), Yi, H. (Co-Investigator), Grant, "Renewable UV-Curable Resins from Lignin and Bio-methacrylic Acid," Office of Industrial Partnerships, Penn State. Total requested: \$300,000.00. (submitted: October 1, 2019.

Other

Chmely, S. (Principal Investigator), 60% credit, "Engineered nanointerfaces to enable plant-inspired 3D printing using renewable materials," USDA National Institute of Food and Agriculture, Federal Agencies. Total requested: \$650,000.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: August 19, 2022.

Chmely, S. (Principal Investigator), 100% credit, "Integrated Production of High-value Bioproducts from Biomass to Promote Rural Bioeconomic Development," West Virginia University, Universities and Colleges. Total requested: \$200,000.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: August 10, 2022.

Chmely, S. (Principal Investigator), 100% credit, "CAREER: Mimicking cell wall architecture to develop plant-based nanocomposites by 3D printing," National Science Foundation, Federal Agencies. Total requested: \$600,588.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: July 21, 2022.

Chmely, S. (Co-Investigator), 5% credit, "Best options for agricultural plastics end of life in Pennsylvania," COP: Department of Agriculture, Commonwealth of Pennsylvania. Total requested: \$183,736.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as

applicable): \$0. (submitted: July 8, 2022.

Chmely, S. (Core Faculty), 0% credit, "Bruker AVANCE NEO 700 MHz NMR Spectrometer with TXO Cryoprobe and SampleCase," National Institutes of Health, Federal Agencies. Total requested: \$1,999,227.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: June 1, 2022.

Chmely, S. (Core Faculty), 3% credit, "MRI: Acquisition of Near Atmospheric Pressure X-ray Photoelectron Spectrometer (NAP-XPS) for Research and Education in Interface Science and Engineering," National Science Foundation, Federal Agencies. Total requested: \$999,999.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: January 19, 2022.

Chmely, S. (Core Faculty), 0% credit, "Bruker AVANCE NEO 500 MHz NMR Spectrometer with TXO Cryoprobe and SampleCase," National Institutes of Health, Federal Agencies. Total requested: \$1,085,578.00, Total Anticipated: \$0, Amount Funded (Total or To Date, as applicable): \$0. (submitted: June 1, 2021.

Development Activities Attended

"Guided Reflection In and Out of the Classroom," Joe Tranquillo (Bucknell U), Leonhard Center, PSU. (May 12, 2022 - Present).

"Engaging Students in Course-based Undergraduate Research Experiences," Allan Feldman (U. of South FL) & Lina Dahlberg (W. Washington U.), American Association for the Advancement of Science (AAAS). (May 10, 2022 - Present).

"NSF CAREER Workshop Series," Gretta Tritch Roman, Michael Mueller, College of Ag Sciences. (June 2022).

"Establishing Contacts with Industry and Academia," Kathy Lynch, Yale University & Malcolm Skingle, GlaxoSmithKline (GSK), UIDP: Strengthening University-Industry Partnerships. (February 17, 2022).

"The Future of Plastics," PSU Materials Research Institute. (January 27, 2022).

"2022 Schreyer Conference - Looking Inward, Moving Forward: Advancing DEIA in Teaching and Learning," Multiple presenters, Schreyer Institute for Teaching Excellence. (January 4, 2022 - January 5, 2022).

"Leonhard Center Workshop: Using Kahoot to Teach Engineering Students," Michael Alley, Leonhard Center. (November 18, 2021).

"Recruitment, Retention, and Mentoring of URM Graduate Students," Levon Esters, PSU Office of Research and Grad Ed. (October 6, 2021).

"Penn State's Open Access Policy," Ana Enriquez, PSU University Libraries. (February 11, 2021).

"ABE Diversity, Equity, and Inclusion Workshop," Patreese Ingram, PSU Office of Multicultural Affairs. (February 10, 2021).

"Nestle Virtual Visit," PSU Materials Research Institute. (January 14, 2021).

"ABE Teaching Faculty Meeting," Ag & Bio Engineering teaching faculty, Ag & Bio Engineering. (August 28, 2020 - December 4, 2020).

"CoE Graduate Program Growth Discussion," Justin Schwartz, PSU College of Engineering. (December 2, 2020).

"Transition to Remote Symposium," PSU Keep Teaching. (November 6, 2020).

"Future of Bioenergy and Biorenewables Workshop," Dan Ciolkosz, Charlie Anderson, et al., PSU Center for Biorenewables. (October 27, 2020).

"Data and Image Manipulation," Tim Jegla, PSU Office of SVPR. (October 20, 2020).

"C-CHANGE Conference: Why are we missing the boat on biogas?," C-CHANGE USDA NIFA CAP, USDA-NIFA. (October 19, 2020).

"Using High-Pressure X-ray Photoelectron Spectroscopy," Fred Henn, Scienta Omicron. (August 5, 2020).

"SIMBA myFunds Portal Check-In Session for Faculty," Administrative Committee on Research (ACOR), Penn State. (July 21, 2020).

"DOE FOA Reviewer Training," US DOE EERE, US Department of Energy. (July 9, 2020).

"Digital Tools for Increased Student Engagement," Leonhard Center & Office for Digital Learning, Penn State. (July 9, 2020).

"Student engagement strategies: Setting up your course for engagement in any environment," Leonhard Center & the Office for Digital Learning, Penn State. (July 7, 2020).

"NSF CAREER lunch and learn," Leonhard Center/Hanover Research, Penn State & Hanover Research. (April 20, 2020).

"Effective, fair remote exams that minimize stress on you and your students," Leonhard Center, Penn State. (April 14, 2020).

"Innovative Teaching at Penn State (ITAP) Lunch Series," varies, Schreyer Institute for Teaching Excellence. (September 20, 2019 - February 18, 2020).

"College of Agricultural Sciences Diversity Book Club," Jason E. Gines, College of Agricultural Sciences Diversity Coordinating Council. (October 1, 2019 - December 10, 2019).

"Principal Investigator Orientation," Alissa Hanshew, Environmental Health and Safety, Penn State. (September 30, 2019).

"Teaching consultation at Schreyer Institute for Teaching Excellence," Larkin Hood, Penn State Schreyer Institute for Teaching Excellence. (September 27, 2019).

"University Park Laboratory Safety," Anissa Wiley, Environmental Health and Safety, Penn State. (September 27, 2019).

"Microsoft Teams Training," Vikki Gearhart, College of Engineering, Penn State. (September 20, 2019).

"MyResearchPortal by Office of Research Information Systems (ORIS)," Office of Engineering Research Administration, Penn State, Research Matters series. (September 19, 2019).

"Safer People Safer Places," Sonya Rae Wilmoth, Center for Sexual and Gender Diversity, Penn State Student Affairs. (September 12, 2019).

SERVICE

Service to the University

College

Committee Work

Faculty Advisory Group for Grants and Contracts Office (CoAS), Member. (2020 - Present).

Faculty Development Committee (CoAS), Member, Elected. (2020 - Present).

Department

Assistance to Student Organizations

Biorenewable Systems Club, Faculty Advisor. (2020 - Present).

Committee Work

Equity & Inclusion Committee, Member. (2020 - Present).

Peer Review of Resident Instruction Committee, Member, Elected. (2020 - Present).

Seminar Planning Committee, Chairperson. (2020 - Present).

Hiring committee for non-tenure track faculty position in Ag & Bio Engineering, Committee Member. (2021).

Reviewed applications for non-tenure-track faculty position in Ag & Bio Engineering

Graduate Studies Committee, Committee Member. (2019 - 2020).

Seminar Planning Committee, Committee Member. (2019 - 2020).

University

Catalysis Seminar Series co-organizer

Catalysis Seminar Series, Committee Member. (2019 - Present).

Service to Society as a Representative of the University

Organizing Conferences and Service on Conference Committees

Value-added chemicals and materials, American Society of Agricultural and Biological Engineers, Co-Organizer, International. (2020 - Present).

Co-organizing and co-moderating with Sushil Adhikari, Auburn University for 2021 meeting

ACS Sustainable Chemistry & Engineering Lectureship Award to Dr. Gregg Beckham, American Chemical Society, Organizer, International. (2017).

The Application of Computational Chemistry to Biomass Conversion, American Chemical Society, Organizer, International. (2015).

Participation in or Service to Professional and Learned Societies

ES-220: Environmental Systems, Bio-based Energy, Fuels and Products, American Society of Agricultural and Biological Engineers, Committee Member, International. (2020 - Present).

Service to the Disciplines and to the Profession

Organizing Conferences and Service on Conference Committees

Frontiers in Biorefining: Chemicals and Products from Renewable Carbon, University of Tennessee's Center for Renewable Carbon, Co-Organizer, International. (2014 - 2018).