

BENJAMIN E. R. SNYDER
Department of Chemistry | University of Illinois Urbana-Champaign
bsnyder@illinois.edu | Tel: (203) 313-2839
last updated: 9/26/22

PROFESSIONAL APPOINTMENTS

2023 Assistant Professor of Chemistry | University of Illinois at Urbana-Champaign

ACADEMIC BACKGROUND

2019 Arnold O. Beckman Postdoctoral Fellow | University of California, Berkeley

Advisor: Professor Jeffrey R. Long

2018 Ph.D., Inorganic Chemistry | NSF Graduate Fellow, Stanford Graduate Fellow | Stanford University

Advisor: Professor Edward I. Solomon

2012 Postbaccalaureate Research Assistant | University of Rochester

Advisor: Professor Michael L. Neidig

2012 B.S., Chemistry | B.A., Mathematics | NSF REU Fellow | University of Rochester

Advisor: Professor Kara L. Bren

2011 CENTC Summer Undergraduate Research Fellow | University of Rochester

Advisor: Professor William D. Jones

PUBLICATIONS

Click [here](#) for Google Scholar profile.

Papers are hyperlinked to each entry below.

*denotes equal co-authorship

19. **Snyder, B.**; Turkiewicz, A.; Furukawa, H.; Paley, M.; Velasquez, E.; Dods, M.; Long, J. *A Ligand Insertion Mechanism for Cooperative NH₃ Capture in Metal–Organic Frameworks*. **Nature** **2022** (accepted, under embargo)
18. Jaramillo, D.; Jaffe, A.; **Snyder, B.**; Smith, A.; Taw, E.; Rohde, R.; Dods, M.; DeSnoo, W.; Meihaus, K.; Harris, T.; Neaton, J.; Long, J. *Metal–organic frameworks as O₂-selective adsorbents for air separations*. **Chemical Science** **2022**, *13*, 10216
17. Rhoda, H.; Heyer, A.; **Snyder, B.**; Bols M.; Plessers, D.; Schoonheydt, R.; Sels, B.; Solomon, E. *Second Sphere Lattice Effects in Copper and Iron Zeolite Catalysis*. **Chemical Reviews** **2022**, *122*, 12207
16. **Snyder, B.***; Bols, M.*; Rhoda, H.*; Plessers, D.; Schoonheydt, R.; Sels, B.; Solomon, E. *Cage Effects Control the Mechanism of Methane Hydroxylation in Zeolites*. **Science** **2021**, *373*, 327 ([click here for commentary from Science](#))
15. Bols, M.*; **Snyder, B.***; Rhoda, H.; Cnudde, P.; Fayad, G.; Schoonheydt, R.; Van Speybroeck, V.; Solomon, E.; Sels, B. *Coordination and Activation of Nitrous Oxide by Iron Zeolites*. **Nature Catalysis** **2021**, *4*, 332
14. Bols, M.; Rhoda, H.; **Snyder, B.**; Solomon, E.; Pierloot, K.; Schoonheydt, R.; Sels, B. *Advances in the synthesis, characterisation, and mechanistic understanding of active sites in Fe-zeolites for redox catalysts*. **Dalton Transactions** **2020**, *49*, 14749

13. **Snyder, B.**; Bols, M.; Rhoda, H.; Vanelderen, P.; Böttger, L.; Braun, A.; Yan, J.; Hadt, R.; Babicz, Jr., J.; Hu, M.; Zhao, J.; Alp, E.; Hedman, B.; Hodgson, K.; Schoonheydt, R.; Sels, B.; Solomon, E. *Mechanism of Selective Benzene Hydroxylation Catalyzed by Iron-Containing Zeolites*. *Proceedings of the National Academy of Sciences* **2018**, *115*, 12124
12. Bols, M.; Hallaert, S.; **Snyder, B.**; Devos, J.; Plessers, D.; Rhoda, H.; Dusselier, M.; Schoonheydt, R.; Pierloot, K.; Solomon E.; Sels, B. *Spectroscopic Identification of the α -Fe / α -O Active Site in Fe-CHA Zeolite for the Low-Temperature Activation of the Methane C-H bond*. *Journal of the American Chemical Society* **2018**, *140*, 12021
11. **Snyder, B.**; Vanelderen, P.; Schoonheydt, R.; Sels, B.; Solomon, E. *Second-Sphere Effects on Methane Hydroxylation in Cu-Zeolites*. *Journal of the American Chemical Society* **2018**, *140*, 9236
10. **Snyder, B.**; Böttger, L.; Bols, M.; Yan, J.; Rhoda, H.; Jacobs, A.; Hu, M.; Zhao, J.; Alp, E.; Hedman, B.; Hodgson, O.; Schoonheydt, R.; Sels, B.; Solomon, E. *Structural Characterization of a non-Heme Iron Active Site in Zeolites that Hydroxylates Methane*. *Proceedings of the National Academy of Sciences* **2018**, *115*, 4565 ([click here for commentary from PNAS](#))
9. **Snyder, B.**; Bols, M.; Sels, B.; Schoonheydt, R.; Solomon, E. *Iron and Copper Active Sites in Zeolites and Their Correlation to Metalloenzymes*. *Chemical Reviews* **2018**, *118*, 2718
8. Solomon, E.; Hadt, R.; **Snyder, B.** *Activating Metal Sites for Biological Electron Transfer*. *Israel Journal of Chemistry* **2016**, *56*, 649
7. **Snyder, B.***; Vanelderen, P.*; Bols, M.; Hallaert, S.; Boettger, L.; Ungur, L.; Pierloot, K.; Schoonheydt, R.; Sels, B.; Solomon, E. *The Active Site of Low-Temperature Methane Hydroxylation in Iron-Containing Zeolites*. *Nature* **2016**, *536*, 317 ([click here for commentary from Nature](#))
6. Daifuku, S.; Kneebone, J.; **Snyder, B.**; Neidig, M. *Iron(II) Active Species in Iron-Bisphosphine Catalyzed Kumada and Suzuki-Miyaura Cross-Couplings of Phenyl Nucleophiles and Secondary Alkyl Halides*. *Journal of the American Chemical Society* **2015**, *137*, 11432
5. Vanelderen, P.*; **Snyder, B.***; Tsai, M.; Hadt, R.; Vancauwenbergh, J.; Coussens, O; Schoonheydt, R.; Sels, B.; Solomon, E. *Spectroscopic definition of the copper active sites in Mordeinite: selective methane oxidation*. *Journal of the American Chemical Society* **2015**, *137*, 6383
4. Daumann, L.; Tatum, D.; **Snyder, B.**; Ni, C.; Law, G.; Solomon, E.; Raymond, K. *New Insights into Structure and Luminescence of Eu^{III} and Sm^{III} Complexes of the 3,4,3-Li(1,2-HOPO) Ligand*. *Journal of the American Chemical Society* **2015**, *137*, 2816
3. Bedford, R.; Brenner, P.; Carter, E.; Clifton, J.; Cogswell, P.; Gower, N.; Haddow, M.; Jeremy, H.; Kehl, J.; Murphy, D.; Neeve, E.; Neidig, M.; Nunn, J.; **Snyder, B.**; Taylor, J. *Iron-Phosphine Catalyzed Cross-Coupling of Tetraorganoborates and Related Group 13 Nucleophiles with Alkyl Halides*. *Organometallics* **2014**, *33*, 5767
2. Daifuku, S*; Al-Afyouni, M*; **Snyder, B.**; Kneebone, J; Neidig, M. *A Combined Mössbauer, MCD and DFT Approach for Iron Cross-Coupling Catalysis: Electronic Structure, In-Situ Formation and Reactivity of Iron-Mesityl-Bisphosphines*. *Journal of the American Chemical Society* **2014**, *136*, 9132
1. Kundu, S.; **Snyder, B.**; Walsh, A.; Brennessel, W.; Jones, W. *C-S Bond Activation of Thioethers Using (dippe)Pt(NBE)₂*. *Polyhedron* **2013**, *58*, 99

GRANTS

4. Long, J. (Lead PI); Reimer, J. (Co-PI); Neaton, J. (Co-PI); Drisdell, W. (Co-PI); Furukawa, H.; Carsch, K.; **Snyder, B.**; Rohde, R.; *et al.* “*Interrogating Selective Metal-Adsorbate Interactions in Metal-Organic Frameworks*” *DOE Office of Science* (**competitive renewal, 2022-2024, \$2,540,000**)
3. Long, J. (PI); Hou, K.; **Snyder, B.** “Metal-Organic Frameworks for the Selective Oxidation of Methane to Methanol” *Shell, Energy Biosciences Institute* (**2019, \$50,000**)
2. Solomon, E. (PI); **Snyder B.** “Spectroscopic Elucidation of Cu and Fe Active Sites in Zeolites” *National Science Foundation* (**competitive renewal, 2017-2019, \$550,000**)
1. Solomon, E. (PI); **Snyder B.**; Hadt, R. “Spectroscopic Elucidation of Cu and Fe Active Sites in Zeolites” *National Science Foundation* (**2014-2016, \$533,800**)

INVITED LECTURES

Yale University, 1/4/22; Princeton University, 1/17/22; Boston College, 1/19/22; University of Illinois at Urbana-Champaign, 1/25/22; Massachusetts Institute of Technology, 2/1/22; University of California, Los Angeles, 2/8/22

PRESENTATIONS

5. *Harnessing Lattice Strain to Activate New Functions in Porous Materials*
2021 Beckman Symposium, virtual (COVID), 8/6/21. Poster and Oral.
4. *Conversion of Methane to Methanol in Metal-Organic Frameworks*
2020 Beckman Symposium, virtual (COVID), 8/6/20. Poster.
3. *Defining the active sites of low-temperature methane hydroxylation in iron and copper zeolites*
253rd ACS National Meeting, San Francisco, 6/2/17. Oral.
2. *Selective Methane Hydroxylation by Fe and Cu Active Sites in Zeolites*
31st William S. Johnson Symposium, Stanford University, 10/14/16. Poster.
1. *Selective Methane Hydroxylation by Fe and Cu Active Sites in Zeolites*
From Methane to Liquid Fuels, Stanford Natural Gas Initiative, 9/14/16. Poster.

AWARDS AND FELLOWSHIPS

- 2019 – 2022** Arnold O. Beckman Postdoctoral Fellowship in Chemical Sciences (**\$270,000**)
2015 William Robert Findley Graduate Chemistry Scholarship (**\$2,000**)
2014 – 2016 National Science Foundation Graduate Research Fellowship (**\$132,000**)
2013 – 2015 Munger, Pollock, Reynolds, Robinson, Smith & Yoedicke Fellowship, Stanford (**\$73,000**)
2012 ACS Undergraduate Inorganic Chemistry Award
2011 CENTC Summer Undergraduate Research Fellowship (with Prof. William Jones)
2010 NSF REU Fellowship (with Prof. Kara Bren)

SERVICE AND LEADERSHIP

- 2022** Graduate Admissions Committee (UIUC)
2022 Mentor, Amgen Summer Scholars Program (UC Berkeley)
2014 – 2018 Program Director, Inspiring Future Scientists Through Shadowing (Stanford) (click **here** for more info)
2013 – 2018 Mentor, Inspiring Future Scientists through Shadowing (Stanford)
2013 – 2018 Chemistry Department Community Outreach Coordinator (Stanford)
2013 – 2018 Chemistry Department Community Outreach Volunteer (Stanford)
2013 chemicalmathematics.wordpress.com (technical blog – click URL for more info)

Journal referee for: *Journal of the American Chemical Society, Physical Chemistry Chemical Physics, Journal of Biological Inorganic Chemistry, Angewandte Chemie, Chemical Science, Chemical Reviews*

Proposal referee for: *Stanford Synchrotron Radiation Laboratory*

TEACHING EXPERIENCE

- UIUC** Physical Methods in Inorganic Chemistry (graduate course, 2023)
- UC Berkeley** Lab development for distance learning (2020), Inorganic Chemistry II (guest lecturer, 2019-2021)
- Stanford** *Ad hoc* lecturer for Stanford Chemistry Outreach (2013-2018), Lab Development for Stanford Chemistry Outreach (2013-2018), Advanced Inorganic Chemistry (TA, graduate course), Statistical Mechanics (advanced TA), Analytical Chemistry Laboratory (TA), Inorganic Chemistry (TA), Accelerated General Chemistry (TA)
- Rochester** Quantum Chemistry (undergraduate TA)

MENTORING EXPERIENCE

- UIUC**
- UC Berkeley** **Adrian Huang** (Ph.D. student), **Rachel Rhode** (Ph.D. student), **Maria Paley** (Ph.D. student), **Arun Johnson** (UC Berkeley 2022), **Connor Pollack** (UC Berkeley 2021), **Katerina Graf** (Ph.D. student), **Orlando Conde** (Amgen Summer Scholar, University of Puerto Rico 2023)
- Stanford** **Dieter Plessers** (Ph.D. student, KU Leuven, 2017), **Hannah Rhoda** (Ph.D. student, Stanford, 2016-2018), **Giulia Tarantino** (Ph.D. Student, Cardiff University, 2016), **Simon Hallaert** (Ph.D. student, KU Leuven, 2016), **Ceri Hammond** (lecturer, Cardiff University, 2015-2016), **Pieter Vanelderren** (postdoc, Stanford, 2014-2015), **Gaby Ramirez** (high school student, 2013), **Andrew Ngo** (high school student, 2014, UC Davis 2019), **Junyu Yang** (high school student, 2014, MIT 2020, currently Ph.D. student with Professor Theodore Betley at Harvard University), **Bethany Lin** (high school student, 2016), **Shawn Antoo** (high school student, 2016), **Brian Chou** (high school student, 2016), **Arun Johnson** (high school student, 2017, currently UC Berkeley 2022 with Prof. Jeffrey Long)