Exponent®
Engineering & Scientific Consulting

Emily Schroeder, Ph.D.

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Professional Profile

As an Associate in the Thermal Sciences Practice, Dr. Schroeder integrates her expertise in chemical engineering, chemistry, and material science to address a broad spectrum of challenges. Her work encompasses root cause analysis, process safety and hazard analysis, consumer product research and development, and incident investigations involving reactive materials, chemical processes, fires, and explosions.

Before joining Exponent, Dr. Schroeder earned her B.S. in Chemical Engineering from the University of Arizona and her Ph.D. in Chemical Engineering from the University of California, Santa Barbara. During her doctoral studies, she specialized in heterogeneous catalysis and reaction engineering. Her experimental research included catalyst synthesis, characterization, and stability testing under reaction conditions, with applications focused on converting greenhouse gases into fuels and chemicals. This work honed her expertise in thermodynamics, heat and mass transfer, and reaction kinetics. She also led a large collaborative Department of Energy project, serving as the primary researcher responsible for coordinating experiments and communicating results across multiple universities, national laboratories, and industrial partners.

Dr. Schroeder's academic training is complemented by practical experience gained through four internships across diverse industries. As an Environmental Engineer at Freeport-McMoRan's Morenci copper mine, she applied regulatory standards to mitigate environmental impact. At PepsiCo, she worked as a Supply Chain Engineer, optimizing heat exchanger and cooling tunnel performance and implementing leak detection procedures to reduce process waste. At XTO Energy, a subsidiary of ExxonMobil, she gained experience as a Facilities Engineer, managing a pilot plant project to capture and utilize flare gas at remote well pads using cryogenic compression technologies. Finally, during a Ph.D. residency at Google's moonshot factory, she conducted technoeconomic analysis and scale-up of multiphase reactors for sustainable chemical processes.

Dr. Schroeder's combination of academic achievements and industry experience underscores her ability to apply fundamental principles to solve complex problems within Exponent's Thermal Sciences Practice.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of California, Santa Barbara, 2024

B.S., Chemical Engineering, University of Arizona, 2019

W.A. Franke Honors College Thesis Award, 2019

University of Arizona Wildcat Excellence Full Tuition Scholarship, 2015-2019

Society of Mining Engineers Intern Merit Scholarship, 2017

Prior Experience

Chemical Engineering Ph.D. Resident, Google, X – The Moonshot Factory, 2023

Upstream Facilities Engineering Intern, XTO Energy, an ExxonMobil Subsidiary, 2019

Supply Chain Intern, PepsiCo Inc., 2018

Environmental Engineering Intern, Freeport-McMoRan Copper and Gold, 2017

Professional Affiliations

American institute of Chemical Engineers (AIChE)

National Association of Fire Investigators (NAFI)

National Fire Protection Association (NFPA)

American Chemical Society (ACS)

Publications

Schroeder E, Dasari P, Nadeem MA, Fickel D, Christopher P. Controlled pretreatment and reconstruction of a bimetallic Pt-Ir/Al2O3/ZSM-5 catalyst for increased stability during butane hydrogenolysis. ACS Engineering Au 2023; 3 (5), 301-315

Schroeder E, Finzel J, Christopher P. Photolysis of atomically dispersed Rh/Al2O3 catalysts: Controlling CO coverage in situ and promoting reaction rates. Journal of Physical Chemistry C 2022; 126, 43, 18292-18305

Gadinas N, Asokan C, Hoffman A, Schroeder E, Zakem G, Hibbits D, Getosian A, Christopher P. Experimental and theoretical identification and characterization of Rh single atoms supported on γ-Al2O3 during NO reduction by CO. ACS Catalysis. 2022; 12, 19, 11697-11715

Schroeder E, Christopher P. Chemical Production Using Light: Are Sustainable Photons Cheap Enough? ACS Energy Letters 2022; 7 (2), 880-884

Presentations

Schroeder E, Christopher P et al., "Mechanism and kinetics of deactivation of Rh/TiO2 catalysts under reverse water gas shift conditions." Oral presentation, Catalysis Gordon Research Seminar; Poster presentation, Catalysis Gordon Research Conference. Colby-Sawyer College, New London, NH, 2024.

Schroeder E, Christopher P et al., "Untangling structure-function relationships for reconstructing Rh/TiO2 catalysts under CO2 hydrogenation conditions." Oral presentation, National Synchrotron Light Source II (NSLS-II) and Center for Functional Nanomaterials (CFN) User's Meeting, Brookhaven National Laboratory, Upton NY, 2024.

Schroeder E, Christopher P et al., "Controlled reconstruction of a bimetallic catalyst for increased stability during butane hydrogenolysis." Oral Presentation, Graduate Student Symposium, Chemical Engineering Department, University of California Santa Barbara, 2023.

Schroeder E, Christopher P et al., “Photolysis for probing reaction mechanisms and promoting rates on atomically dispersed Rh Catalysts.” Oral presentation, The 27th North American Catalysis Society Meeting, New York, NY, 2022.

“Selective catalytic methane activation on Rh active sites.” Oral Presentation, First-Year Research Seminar, Chemical Engineering Department, University of California, Santa Barbara, 2020.

“Flare gas capture and utilization for electric power by remote CNG technology.” Oral presentation, Internship Final Presentations, ExxonMobil Campus, Spring, TX, 2019.