

Concise Curriculum Vitae
Shuang Gu, Ph.D.
Sam Bloomfield Chair Professor in Engineering
Department of Mechanical Engineering, Wichita State University
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(As of 10/20/2025)

EDUCATION

Ph.D. Chemical Engineering, Dalian University of Technology	09/2001–12/2007
• Advisors: Prof. Gaohong He	
B.E. Chemical Engineering, Dalian University of Technology	09/1996–07/2000
• Advisor: Prof. Zongchang Zhao	

PROFESSIONAL APPOINTMENTS

Sam Bloomfield Chair Professor in Engineering, Wichita State University	05/2025–Present
• Department of Mechanical Engineering	
Associate Professor, Wichita State University	08/2020–08/2020
• Department of Mechanical Engineering	
Assistant Professor, Wichita State University	08/2015–08/2020
• Department of Mechanical Engineering	
Research Assistant Professor, University of Delaware	10/2012–07/2015
• Department of Chemical & Biomolecular Engineering	
Postdoctoral Researcher, University of Delaware	09/2011–09/2012
• Department of Chemical & Biomolecular Engineering, Advisor: Prof. Yushan Yan	
Postdoctoral Researcher, University of California – Riverside	08/2008–08/2011
• Department of Chemical & Environmental Engineering, Advisor: Prof. Yushan Yan	
Junior Researcher, University of California – Riverside	08/2007–07/2008
• Department of Chemical & Environmental Engineering, Advisor: Prof. Yushan Yan	
Assistant Engineer, China Petroleum & Chemical Corporation	07/2000–07/2001
• SINOPEC Shanghai Gaoqiao Petrochemical Company	

SELECTED FEDERAL GRANTS

NSF 2025 FMRG-ECO (Co-PI, and PI at WSU)	\$900,000 of \$3,000,000
• FMRG: Eco: Electro-Manufacturing of Ethylene and Nitrogenous Chemicals by Synergizing the Capture and Conversion of CO₂ and Waste Nitrogen	05/01/2025–04/30/2029
NSF 2023 EPSCoR Track-II FEC (PI)	\$2,000,000
• Collaborative Research: RII Track-2 FEC: Promoting N₂O- and CO₂-Relieved Nitrogen Fertilizers for Climate Change-Threatened Midwest Farming and Ranching	09/01/2023–08/31/2027
DOE 2023 EEREHFTO (Co-PI, and PI at WSU)	\$375,000 of \$1,500,000
• Sensing Hydrogen Losses at 1 ppb-Level for Hydrogen-Blending Natural Gas Pipelines (PI: Dr. Shan Hu at ISU)	08/01/2023–12/31/2026
NSF 2022 ECO-CBET (PI)	\$700,000
• Collaborative Research: ECO-CBET: Convergent Electrollysis-Electrodialysis System (CEES) to Curb Urban Chloride Pollution by Eco-friendly Road Deicing and Waste Salt Upcycling	09/01/2022–08/31/2026
NSF 2020 FMSG (Co-PI, and PI at WSU)	\$140,000 of \$500,000

- [FMSG: Electrochemical Upcycling of Waste Nitrates for Eco-Manufacturing of Nitrogen-Based Chemicals](#) (PI: W. Li at ISU) 01/01/2021–12/31/2022 **\$855,000**
- [Alkaline Membrane-Based Ammonia Electrosynthesis](#) 06/19/2017–12/18/2019 **\$120,000 of \$1,868,796**
- [Robust Hydroxide-Exchange Membranes Based on Poly\(aryl piperidinium\)](#) (PI: Dr. Y.S. Yan at UD) 01/01/2017–06/30/2019 **\$600,000**
- [Highly Stable Membranes for Redox-Flow Batteries](#) (PI: Dr. Y.S. Yan at UD) 05/01/2015–04/30/2017 **\$928,380**
- [High-voltage and low-crossover redox-flow batteries](#) (PI: Dr. Y.S. Yan at UD) 01/09/2013–03/06/2017

SELECTED PATENTS

Granted Patents

1. **S. Gu**, and N. Ha, Cobalt-Coated Metal Electrodes for Electrochemical Conversion of Nitrate to Ammonia, **US Patent Application**, No. 63/332,738, filed on 04/22/2023.
2. **S. Gu** and Farshad Houtaham, Converting natural gas to value-added liquid fuels, **US Patent**, No. 10.519.084, granted on 12/31/2019.
3. Y.S. Yan, **S. Gu**, K. Gong, Double-membrane triple-electrolyte design for high-voltage and low-crossover redox flow batteries, **US Patent**, No. 9,917,323, granted on 03/13/2018; [PCT Patent Application, No. PCT/US2013/045595, filed on 6/13/2013.] (*Licensed to DEGi-Storage LLC*)
4. Y.S. Yan, B.Z. Zhang, **S. Gu**, Phosphonium cations and polymers incorporating them, **US Patent**, No. 10,056,638, granted on 08/21/2018.
5. Y.S. Yan, **S. Gu**, K. Gong, Multiple-membrane multiple-electrolytes redox flow battery design, **US Patent**, No. 9,640,826, granted on 05/02/2017; [PCT Patent Application, No. PCT/US2013/045595, file on 6/13/2013.] (*Licensed to DEGi-Storage LLC*)
6. Y.S. Yan, **S. Gu**, and R. Cai, Highly basic ionomers and membranes and anion/hydroxide exchange fuel cells comprising ionomers and membranes, **US Patent**, No. 9,263,757, granted on 02/16/2016.

SELECTED JOURNAL PUBLICATIONS

Published **71 journal articles/book chapters**, receiving **10,788 citations** with an **h-index of 39**. The number of journal articles with 100+ citations is **27**.

Publications

1. M. R. Shakil, A. Dumre, N. Subedi, Y. Liiu, S. Hu, and **S. Gu***, [Exploration of electrochemical hydrogen pumping with ultralow feed concentration down to 1 ppm](#), *Chemical Communications*, **2025**, in press. (*Cover Picture*)
2. T. Li, N. Subedi, S. Kang, Q. Mao, Y. Fei, **S. Gu***, and W. Li*, [High-current-density electrosynthesis of formate from captured CO₂ solution by MOF-derived bismuth nanosheets](#), *Chemical Engineering Journal*, **2025**, 519, 165272.
3. Y. Wang*, W. Li, and S. Gu, [Farmers' attitude towards green ammonia produced by upcycling waste nitrogen: Empirical evidence from an Iowa study](#), *Sustainable Futures*, **2025**, 9, 100450.
4. U.B. Shahid, Y. Kwon, Y. Yuan, **S. Gu**, and M. Shao*, [High-performance Ammonia Electrosynthesis from Nitrate in a NaOH-KOH-H₂O Ternary Electrolyte](#), *Angewandte Chemie Int. Ed.*, **2024**, 63, e202403633.
5. Y. Chen, P. Ammari-Azar, H. Liu, J. Lee, Y. Xi, M.J. Castellano, **S. Gu***, and W. Li*, [Sustainable waste-nitrogen upcycling enabled by low-concentration nitrate electrodialysis and high-performance ammonia electrosynthesis](#), *EES Catalysis*, **2023**, 1, 504–515. (*Cover Picture*)
6. H. Liu, J. Lee, Y. Chen, **S. Gu**, and W. Li*, [Ammonia-mediated CO₂ capture and direct electroreduction to formate](#), *ACS Energy Letters*, **2022**, 7, 4483–4489.

7. Y. Chen, **S. Gu**, and W. Li*, [Solid-electrolyte interphases enable breakthrough performances of Li-mediated ammonia electrosynthesis](#), *Joule*, **2022**, 6, 1973–1976. (*Invited Preview*)
8. U. B. Shahid, Y. Chen, **S. Gu***, W. Li*, and M. Hua*, [Electrochemical nitrogen reduction: an intriguing but challenging quest](#), *Trends in Chemistry*, **2022**, 4, 141–156.
9. H. Liu, J. Park, Y. Chen, Y. Qiu, Y. Cheng, K. Srivastava, **S. Gu**, B. H. Shanks, L. T. Roling*, and W. Li*, [Electrocatalytic Nitrate Reduction on Oxide-Derived Silver with Tunable Selectivity to Nitrite and Ammonia](#), *ACS Catalysis*, **2021**, 11, 14, 8431–8442.
10. Y. Chen, H. Liu, N. Ha, S. Licht*, **S. Gu***, and W. Li*, [Revealing nitrogen-containing species in commercial catalysts used for ammonia electrosynthesis](#), *Nature Catalysis*, **2020**, 3, 1055–1061. (*100+ Citations*)
11. F. Desai, N. Seyedhassantehrani, M. Shagar, **S. Gu***, and R. Asmatulu*, [Preparation and characterization of KOH-treated electrospun nanofiber mats as electrodes for iron-based redox-flow batteries](#), *J. Energy Storage*, **2020**, 27, #101053
12. Y. Qiu, L. Xin, I.T. McCrum, F. Guo, T. Ma, Y. Ren, Q. Liu, L. Zhou, **S. Gu**, M.J. Janik, and W. Li*, [BCC-Phased PdCu Alloy as a Highly Active Electrocatalyst for Hydrogen Oxidation in Alkaline Electrolytes](#), *JACS*, **2018**, 140, 140, 16580–16588. (*100+ Citations*)
13. Y. Zhao, **S. Gu**, K. Gong, J. Zheng, J.H. Wang, and Y.S. Yan, [Low-Voltage Gaseous HCl Electrolysis with an Iron Redox-Mediated Cathode for Chlorine Regeneration](#), *Angew. Chem. Int. Ed.*, **2017**, 56, 10735–10739.
14. K. Gong, F. Xu, J. Grunewald, X.Y. Ma, Y. Zhao, **S. Gu***, and Y.S. Yan*, [All-soluble all-iron aqueous redox-flow battery](#), *ACS Energy Lett.*, **2016**, 1, 89–93. (*300+ Citations*)
15. B. Zhang, R. Kaspar, **S. Gu**, J.H. Wang, Z.B. Zhuang, and Y.S. Yan, [A new alkali-stable phosphonium cation based on fundamental understanding of degradation mechanisms](#), *ChemSusChem*, **2016**, 9, 2371–2379.
16. K. Gong, X.Y. Ma, K.M. Conforti, K.J. Kuttler, J.B. Grunewald, K.L. Teager, M.Z. Baznt, **S. Gu***, and Y.S. Yan*, [A zinc–iron redox-flow battery under \\$100 per kW h of system capital cost](#), *Energy Environ. Sci.*, **2015**, 8, 2941–2945. (*Highlighted as the Authors’ Choice Article by ACS Energy Letters: Top 1*) (*200+ Citations*)
17. **S. Gu**, J.H. Wang, R.B., Kaspar, Q.R. Fang, B.Z. Zhang, E.B. Coughlin, and Y.S. Yan, [Permethyl Cobaltocenium \(Cp*₂Co⁺\) as an Ultra-Stable Cation for Polymer Hydroxide-Exchange Membranes](#), *Sci. Rep.*, **2015**, 5, Article No.: 11668. (*100+ Citations*)
18. K. Gong, Q.R. Fang, **S. Gu***, S.F.Y. Li, and Y.S. Yan*, [Nonaqueous redox-flow batteries: organic solvents, supporting electrolytes, and redox pairs](#), *Energy Environ. Sci.*, **2015**, 8, 3515–3530. (*500+ Citations*)

BOOK CHAPTERS

1. **S. Gu**, B.J. Xu, Y.S. Yan, [Electrochemical Energy Engineering: A New Frontier of Chemical Engineering Innovation](#), *Annu. Rev. Chem. Biomol. Eng.*, **2014**, 5, 429–454. (*Invited Book Chapter*)
2. **S. Gu**, J.H. Wang, B.Z. Zhang, R.B. Kaspar, and Y.S. Yan, [Hydroxide exchange membranes and ionomers](#), Book Chapter (Ch. 6) in *Materials for Low-Temperature Fuel Cells*, 1st Ed., edited by B. Ladewig, S.P. Jiang, Y.S. Yan, and G.Q.M. Lu., *Wiley-VCH*, **2015**, 125–144. (*Invited Book Chapter*)

AWARDS/HONORS

- **2025 Sam Bloomfield Chair Professor in Engineering**, distinguished professorship
- **2025 Sigma Xi Honor Society Member**, the scientific research honor society – WSU Chapter
- **2025 WSU Excellence in Research Award** from WSU. (**Top Research Award at WSU**)
- **2025 Wallace Excellence in Research Award** from College of Engineering at WSU
- **2022 John A See Innovation Award**, “Nitrate-Selective Membrane for Water Treatment”, **PI**, \$10,000
- **2019 WSU Excellence in Research Award** from WSU. (**Top Research Award at WSU**)
- **2019 Wallace Excellence in Research Award** from College of Engineering at WSU
- **2019 John A. See Innovation Award**, “Redox-Mediated Ammonia Synthesis”, **PI**, \$13,280
- **2016 John A. See Innovation Award**, “Turning Air to Ammonium under Ambient Conditions”, **PI**, \$15,000
- **2016 Undergraduate Research Award** from WSU, “Quantum Chemistry-Based Calculations”, **PI**, \$1,000