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Department of Chemical and Biomolecular Engineering
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EDUCATION:

June 2004 Ph.D. Chemical Engineering, University of Arizona, Tucson
June 2004 M.A. Physical Chemistry, University of Arizona, Tucson
June 1998 B.S. Mathematics; Pre-med, Wellesley College

PROFESSIONAL EXPERIENCE:

September 2020-present Presidential Distinguished Professor of Chemical Engineering and Energy Policy, University of Pennsylvania, PA

May 2020-present Senior Fellow, World Resources Institute, leading Carbon Removal Program

August 2018-December 2020 James H. Manning Chair Professor, Chemical Engineering, Worcester Polytechnic Institute, Worcester, MA

August 2017-July 2018 Interim Department Head, Chemical and Biological Engineering, Colorado School of Mines, Golden, CO

June 2016-July 2018 Associate Professor, Chemical and Biological Engineering, Colorado School of Mines, Golden, CO

January 2008-May 2016 Assistant Professor of Energy Resources Engineering, Stanford University

July 2004-December 2008 Assistant Professor, Chemical Engineering, Worcester Polytechnic Institute

TEXTBOOK:

Wilcox, J. Carbon Capture, Springer Publishing, March 2012, ISBN 978-1-4614-2214-3.
275 citations

*over 40,000 e-book downloads and *ca.* 1000 hardcopies sold in in 2012-20; 4000 translated copies sold (Chinese Electricity Press) in China in December 2013.

HONORS AND DISTINCTIONS:

2019-20 University of Pennsylvania's Kleinman Center for Energy Policy Fellows Program

2019-20 Max-Planck Sabbatical Award – Max Planck Institute for Dynamics of Complex Technical Systems

2018	Invited TED Talk – The Age of Amazement – Speaking on Direct Air Capture, Vancouver, Canada
2017	Member of the 2 nd Cohort, DOE’s Oppenheimer Energy Sciences Leadership Group, started by Ernie Moniz in 2016
2017	Air & Waste Management Association Stern Award, Mercury Reaction Chemistry on Activated Carbon
2017	Interviews in Nature, The Economist, Rolling Stone, Advanced Science News, and VICE News on Carbon Capture and Negative Emissions
2017	Science Magazine Climate highlight for our 2017 Environmental Science and Technology paper on Carbon Capture from the Industrial Sector, http://science.sciencemag.org/content/357/6357/1251.1
2016	ACS best presentation identified by William Koros on Novel Material for Separation, Storage, and Utilization, ACS Fall Meeting, PA
2010	Best Paper Award, “Trace Metal Emissions from Coal Combustion,” Geological Society of America
2009	Frederick E. Terman Fellowship, Stanford University
2009	University of Arizona Advances Junior Scientist Award
2007	ARO Young Investigator Award, Energy Conversions Division
2007	ACS Petroleum Research Fund Young Investigator Award
2006	Selected to represent NSF as a “New Face in Engineering for 2006” and featured in USA Today
2005	NSF Career Award, Combustion & Plasma Division

FIELDS OF SPECIALIZATION:

Carbon Capture
 Negative Emissions *with focus on direct air capture and CO₂ mineralization*
 Membrane and Adsorption Separation Processes
 Natural Gas Reforming for Hydrogen Production with Carbon Capture
 Trace Metal Capture and Speciation

BOOK CHAPTERS:

CCS in the Iron and Steel Industry in Carbon Capture and Storage, Royal Society of Chemistry, Ed. Niall Mac Dowell, 2019.

Atomistic-Level Models in Mercury Control for Coal-Derived Gas Streams, Wiley-VCH, Eds. Evan Granite, Constance Senior, Henry Pennline, 2014.

PEER-REVIEWED ARTICLES:

Total citations: ~ 9,420

h-index: 50

**Student and postdoctoral advisees underlined*

1. Kian, K., Liguori, S., Pilorge, H., Crawford, J.M., Carreon, M.A., Martin, J.L., **Wilcox, J.**, “Prospects of CO₂ capture via 13x for low-carbon hydrogen production using a Pd-based metallic membrane reactor,” *Chem. Eng. J.* 127224, 2020.
2. Morrow, D., Thompson, M.S., Anderson, A., Batres, M., Buck, H.J., Dooley, K., **Wilcox, J.**, “Principles for Thinking about Carbon Dioxide Removal in Just Climate Policy,” *One Earth* 3(2), 150-153, 2020.

3. McQueen, N., Kelemen, P., Dipple, G., Renforth, P., **Wilcox, J.**, “Ambient Weathering of Magnesium Oxide for CO₂ Removal from Air,” *Nature Communications*, 11(1), 1-10, 2020.
4. McQueen, N., Psarras, P., Pilorge, H., McQueen, N., Liguori, S., He, J., Yuan, M., Woodall, C.M., Kourosh, K., Pierpoint, L., Jurewicz, J., Lucas, M.J., Jacobson, R., Deich, N., **Wilcox, J.**, “Cost Analysis of Direct Air Capture and Sequestration Coupled to Low-Carbon Thermal Energy in the U.S.,” *Env. Sci. Technol.*, 54(12), 7542-7551, 2020.
5. Pilorge, H., McQueen, N., Maynard, D., Psarras, P., He, J., Rufael, T., **Wilcox, J.**, “Cost Analysis of Carbon Capture and Sequestration of Process Emissions from the U.S., Industrial Sector,” *Env. Sci. Technol.*, 54(12), 7524-7532, 2020.
6. Psarras, P., He, J., Pilorge, H., McQueen, N., Jensen-Fellows, A., Kourosh, K., **Wilcox, J.**, “Part 1: Cost Analysis of Carbon Capture and Sequestration from U.S. Natural Gas-fired Power Plants,” *Env. Sci. Technol.*, accepted.
7. Liguori, S., Kourosh, K., Buggy, N., Anzelmo, B.H., **Wilcox, J.**, “Opportunities and Challenges of Low-Carbon Hydrogen via Metallic Membranes,” *Prog. Energy Comb. Sci.*, 80, 100851, 2020.
8. Renforth, P., **Wilcox, J.**, “Editorial: The Role of Negative Emissions Technologies in Addressing our Climate Goals,” *Front. Clim.*, 2020.
9. **Wilcox, J.**, “Carbon Capture: An electro-swing approach,” *Nature Energy*, 2019.
10. Baker, S.E., Peridas, G., Stolaroff, J.K., Goldstein, H.M., Pang, S.H., Lucci, F.R., Li, W., Slessarev, E.W., Pett-Ridge, J., Ryerson, F.R., Aines, R.D., Sanchez, D.L., Cabiyo, B., Baker, J., Uden, S., Runnebaum, R., **Wilcox, J.**, Psarras, P.C., Pilorge, H., McQueen, N., Maynard, D., McCormick, C., “Getting to Neutral: Options for Negative Carbon Emissions in California,” Lawrence Livermore National Lab, Livermore, CA, LLNL-TR-796100, 2019.
11. Woodall, C.M., McQueen, N., Pilorge, H., **Wilcox, J.**, “Utilization of mineral carbonation products: current state and potential,” *Greenhouse Gases: Science and Technology*, 2019.
12. Psarras, P., Anderson, R., **Wilcox, J.**, Gomez-Gualdrón, DA, “Dissociation, Dissolution, and Diffusion of Nitrogen in V_xFe_y and V_xCr_y Alloy Membranes Studied by First Principles,” *J. Phys. Chem. C*, 123 (50), 30416, 2019.
13. Pacala, S., ..., **Wilcox, J.**, “Negative emissions technologies and reliable sequestration: A research agenda, National Academies Press, 2019.
14. Psarras, P., Anderson, R., Gomez-Gualdrón, DA, **Wilcox, J.**, “Material Consequences of Hydrogen Dissolution in Palladium Alloys Observed from First Principles,” *J. Phys. Chem. C*, 123 (36), 22158, 2019.
15. Yuan, M., Teichgraber, H., **Wilcox, J.**, Brandt, AR, “Design and operations optimization of membrane-based flexible carbon capture,” *Int. J. Greenhouse Gas Control*, 84, 154, 2019.
16. Holmes, R.T., Aljamaan, H., Vishal, V., **Wilcox, J.**, and Kovscek, A.R., “Idealized Shale Sorption Isotherm Measurements to Determine Pore Capacity, Pore Size Distribution, and Surface Area” *Energy & Fuels.*, 33(2) 2019.
17. Kelemen, P., Benson, SM, Pilorge, H., Psarras, P.C., **Wilcox, J.**, “An Overview of the Status and Challenges of CO₂ Storage in Minerals and Geological Formations,” *Frontiers in Climate*, 1,9, 2019.
18. Liguori, S., Lee, S., Yuan, M., **Wilcox, J.**, “Innovative N₂-selective metallic membranes for the potential use of CO₂ capture,” *J. Memb. Sci.*, 2019.
19. Renforth, P., **Wilcox, J.**, “Field Grand Challenge: Negative Emissions Technologies,” *Frontiers Climate* 1,1, 2019.
20. Yuan, M., Lee, K., Van Campen, D. G., Liguori, S., Toney, M. F., **Wilcox, J.**, “Hydrogen Purification in Palladium-Based Membranes: An Operando X-ray Diffraction Study”, *Industrial & Engineering Chemistry Research*, 58(2), 926-934, 2018

21. Anzelmo, B., **Wilcox, J.**, Liguori, S., “Hydrogen production via natural gas steam reforming in a Pd-Au membrane reactor. Comparison between methane and natural gas steam reforming reactions” *Journal of Membrane Science*, 568, 113-120, 2018
22. Kian, K., Woodall, C., **Wilcox, J.**, Liguori, S. “Performance of Pd-Based Membranes and Effects of Various Gas Mixtures on H₂ Permeation” *Environments*, 5(12), 128, 2018.
23. Anzelmo, B., **Wilcox, J.**, Liguori, S. “Hydrogen production via natural gas steam reforming in a Pd-Au membrane reactor. Investigation of reaction temperature and GHSV effects and long-term stability” *Journal of Membrane Science*, 565, 25-32, 2018.
24. Kelemen, P. B., Aines, R., Bennett, E., Benson, S. M., Carter, E., Coggon, J. A., de Obeso, J.C., Evans, O., Gadikota, G., Dippleh, G.M., Godard, Harris, M., Higgins, J.A., Johnson, K.T.M., Kourim, F., Lafay, R., Lambart, S., Manning, C.E., **Wilcox, J.**, “In situ carbon mineralization in ultramafic rocks: Natural processes and possible engineered methods” *Energy Procedia*, 146, 92-102, 2018
25. Fuss, S., Lamb, W. F., Callaghan, M. W., Hilaire, J., Creutzig, F., Amann, T., Beringer, T., Garcia, W. D. O., Hartmann, J., Khanna, T., Luderer, G., Nemet, G. F., Rogelj, J., Smith, P., Vicente J. L. V., **Wilcox, J.**, Dominguez, M. D. M. Z., Minx, J.C., “Negative emissions—Part 2: costs, potentials and side effects” *Environmental Research Letters*, 13(6), 063002, 2018
26. Minx, J. C., Lamb, W. F., Callaghan, M. W., Fuss, S., Hilaire, J., Creutzig, F., , Amann, T., Beringer, T., Garcia, W. D. O., Hartmann, J., Khanna, T., Lenzi, D., Luderer, G., Nemet, G. F., Rogelj, J., Smith, P., Vicente J. L. V., **Wilcox, J.**, Dominguez, M. D. M. Z., “Negative emissions—Part 1: Research landscape and synthesis” *Environmental Research Letters*, 13(6), 063001, 2018
27. Anzelmo, B., Liguori, S., Mardilovich, I., Iulianelli, A., Ma, Y. H., **Wilcox, J.**, Basile, A. “Fabrication & performance study of a palladium on alumina supported membrane reactor: Natural gas steam reforming, a case study” *International Journal of Hydrogen Energy*, 43(15), 7713-7721, 2018
28. Fuerst, T. F., Petsalis, E. P., Lundin, S. T. B., **Wilcox, J.**, Way, J. D., Wolden, C. A., “Experimental and Theoretical Insights into the Potential of V₂O₃ Surface Coatings for Hydrogen Permeable Vanadium Membranes” *The Journal of Physical Chemistry C*, 122(6), 3488-3496, 2018
29. Liguori, S., **Wilcox, J.**, “Design Considerations for Postcombustion CO₂ Capture With Membranes” *Current Trends and Future Developments on (Bio-) Membranes* (pp. 385-413). Elsevier., 2018
30. Bui, M., Adjiman, C.S., Bardow, A., Anthony, E.J., Boston, A., Brown, S., Fennell, P.S., Fuss, S., Galindo, A., Hackett, L.A., Hallett, J.P., Herzog, H.J., Jeckson, J., Kemper, J., Krevor, S., Maitland, G., Matuszewski, M., Metcalfe, I., Petit, C., Puxty, G., Reimer, J., Reiner, D.M., Rubin, E., Scott, S.A., Shah, N., Smit, B., Trusler, J. P. M., Webley, P., **Wilcox, J.**, Dowell, N.M., “Carbon Capture and Storage: The Way Forward” *Energy Environ. Sci.*, 11(5), 1062-1176, 2018.
31. Jung, J.E., Liguori, S., Jew, A.D., Brown, G.E., Jr., **Wilcox, J.**, “Theoretical experimental investigations of mercury adsorption on hematite surfaces,” *J. Air & Waste Manag. Assoc.*, 68(1), 39-53, 2018. (invited based upon Stern Award)
32. Psarras, P., He, J., **Wilcox, J.**, “Effect of water on the CO₂ adsorption capacity of amine-functionalized carbon sorbents,” *Ind. Eng. Chem. Res.*, 56(21), 6317-6325, 2017. (invited by William Koros, based upon ACS Best Presentation Award in 2016)
33. Lee, K., de Lannoy, C.F., Liguori, S., **Wilcox, J.**, “Thermochemical Analysis of Molybdenum Thin Films on Porous Alumina, *Langmuir*, 33(38), 9521-9529, 2017.

34. Bains, P., Psarras, P., Wilcox, J., “CO₂ capture from the industry sector,” *Prog. Energy Combust. Sci.*, 63, 146-172, 2017. (invited by Hai Wang, Stanford University)
35. Yuan, M., Liguori, S., Lee, K., Van Campen, D.G., Toney, M.F., Wilcox, J., “Vanadium as a Potential Membrane Material for Carbon Capture: Effects of Minor Flue Gas Species,” *Environ. Sci. Technol.*, 51(19), 11459-11467, 2017.
36. Psarras, P.C., Comello, S., Bains, P., Charoensawadpong, P., Reichelstein, S., Wilcox, J., “Carbon Capture and Utilization from in the Industrial Sector,” *Environ. Sci. Technol.*, 51(19), 11440-11449, 2017.
37. Kirchofer, A., Firouzi, M., Psarras, P., Wilcox, J., “Modeling CO₂ Transport and Sorption in Carbon Slit Pores,” *J. Phys. Chem. C*, 121(38), 21018-21028, 2017.
38. Holmes, R., Rupp, E.C., Vishal, V., Wilcox, J., “Selection of shale preparation protocol and outgas procedures for applications in low-pressure analysis,” *Energy & Fuels*, 31(9), 9043-9051, 2017.
39. Psarras, P., Krutka, H., Fajardy, M., Zhang, Z., Liguori, S., Dowell, N.M., Wilcox, J., “Slicing the pie: how big could carbon dioxide removal be?” *Wiley Interdisciplinary Reviews: Energy and Environment*, 6(5), 2017. (invited by Mark Barteau, U of Michigan)
40. Lee, S.S., Wilcox, J., “Behavior of mercury emitted from the combustion of coal and dried sewage sludge: The effect of unburned carbon, Cl, Cu, and Fe,” *Fuel*, 203, 749-756, 2017.
41. Psarras, P., Holmes, R., Rupp, E.C., Vishal, V., Wilcox, J., “Selection of shale preparation protocol and outgas procedures for applications in low-pressure analysis,” *Acc. Chem. Res.*, 50(8), 1818-1828, 2017. (invited by Ian Bourg, Princeton University)
42. Lee, K., Liguori, S., Psarras, P., Wilcox, J., “Theoretical Study of Nitrogen Absorption in Metals,” *J. Phys. Chem. C*, 121(31), 17016-17028, 2017.
43. Aljama, H., Wilcox, J., “Microscopic diffusion of CO₂ in clay nanopores,” *Chem. Phys. Lett.*, 677, 162-166, 2017.
44. Wilcox, J., Psarras, P., Liguori, S., “Assessment of reasonable opportunities for direct air capture,” *Environ. Res. Lett.*, 12(6), 065001, 2017. (invited by Rob Jackson, Stanford University)
45. To, J.W.F., Ng, J.W.D., Siahrostami, S., Koh, A.L., Lee, Y., Chen, Z., Fong, K.D., Chen, S., He, J., Bae, W.-G., Wilcox, J., Jeong, H.Y., Kim, K., Studt, F., Norskov, J.K., Jaramillo, T.F., Bao, Z., “High-performance oxygen reduction and evolution carbon catalysis: From mechanistic studies to device integration,” *Nano Res.*, 10(4), 1163-1177, 2017.
46. Aljamaan, H., Holmes, R., Vishal, V., Haghpanah, R., Wilcox, J., Kavscek, A.R., “CO₂ Storage and Flow Capacity Measurements on Idealized Shales from Dynamic Breakthrough Experiments,” *Energy & Fuels*, 31(2), 1193-1207, 2017.
47. Anzelmo, B., Wilcox, J., Liguori, S., “Natural gas steam reforming reaction at low temperature and pressure conditions for hydrogen production via Pd/PSS membrane reactor,” *J. Memb. Sci.*, 522, 343-350, 2017.
48. Psarras, P., Wilcox, J., Ball, D.W., “Effect of Ag and Pd promotion on CH₄ selectivity in Fe(100) Fischer-Tropsch Catalysis,” *Phys. Chem. Chem. Phys.*, 19(7), 5495-5503, 2017.
49. Geatches, D.L., Metz, D.N., Mueller, J., Wilcox, J., “An ab initio characterization of the electronic structure of LaCo_xFe_{1-x}O₃ for x ≤ 0.5,” *Phys. Status Solid. B*, 253(9), 1673-1687, 2016.
50. He, J., To, J.W.F., Psarras, P., Yan, H., Atkinson, T., Holmes, R.T., Nordlund, D., Bao, Z., Wilcox, J., “Tunable Polyaniline-Based Porous Carbon with Ultrahigh Surface Area for CO₂ Capture at Elevated Pressure,” *Adv. Energy Mater.*, 6(14), 2016.

51. Lulianelli, A., Alavi, M., Bagnato, G., Liguori, S., **Wilcox, J.**, Rahimpour, M.R., Eslamlouyan, R., Anzelmo, B., Basile, A., “Supported Pd-Au membrane reactor for hydrogen production: Membrane preparation, characterization, and testing,” *Molecules*, 21(5), 581, 2016.
52. Tsai, C., Lee, K., Yoo, J.S., Liu, X., Aljama, H., Chen, L.D., Dickens, C.F., Geisler, T.S., Guido, C.J., Joseph, T.M., Kirk, C.S., Latimer, A.A., Loong, B., McCarty, R.J., Montoya, J.H., Power, P., Singh, A.Y., Willis, J.J., Winterkorn, M.M., Yuan, M., Zhao, Z.-J., **Wilcox, J.**, Norskov, J., “Direct water decomposition on transition metal surfaces: structural dependence and catalytic screening,” *Catal. Lett.*, 146(4), 718-724, 2016.
53. Lulianelli, A., S. Liguori, J. Wilcox, A. Basile, “Advances on methane steam reforming to produce hydrogen through membrane reactors technology: A review,” *Catalysis Reviews*, 58(1), 1-35, 2016
54. To, J.W.F., J. He, J. Mei, R. Haghpanah, Z. Chen, T. Kurosawa, S. Chen, W.-G. Bae, L. Pan, J.B.-H. Tok, J. Wilcox, Z. Bao, “Hierarchical N-doped Carbon as CO₂ Adsorbent with High CO₂ Selectivity from Rationally Designed Polypyrrole Precursor,” *J. Amer. Chem. Soc.*, 138(3), 1001-1009, 2016.
55. Psarras, P., He, J., Wilcox, J., Molecular simulations of nitrogen-doped hierarchical carbon adsorbents for post-combustion CO₂ capture,” *Phys. Chem. Chem. Phys.*, 18(41), 28747-28758, 2016.
56. Jung, J.E., D. Geatches, K. Lee, S. Aboud, G.E. Brown, Jr., J. Wilcox, “First-Principles Investigation of Mercury Adsorption on the α -Fe₂O₃ (1102) Surface,” *J. Phys. Chem. C*, 119(47), 26512-26518, 2015.
57. **Wilcox, J.**, B. Wang, E. Rupp, R. Taggart, H. Hsu-Kim, M.L.S. Oliveira, C.M.N.L. Cutruneo, S. Taffarel, L.F.O. Silva, S.D. Hopps, G.A. Thomas, J.C. Hower, “Observations and Assessment of Fly Ashes from High-Sulfur Bituminous Coals and Blends of High-Sulfur Bituminous and Subbituminous Coals: Environmental Processes Recorded at the Macro- and Nanometer Scale,” *Energy & Fuels*, 29(11), 7168-7177, 2015.
58. Lee, K., M. Yuan, J. Wilcox, “Understanding Deviations in Hydrogen Solubility Predictions in Transition Metals through First-Principles Calculations,” *J. Phys. Chem. C*, 119(34), 19642-19653, 2015.
59. Jew, A.D., E.C. Rupp, D.L. Geatches, J.E. Jung, G. Farfan, L. Bahet, J.C. However, G.E. Brown, Jr., J. Wilcox, “Mercury Interaction with the Fine Fraction of Coal-Combustion Fly Ash in a Simulated Coal Power Plant Flue Gas Stream,” *Energy & Fuels*, 29(9), 6025-6038, 2015.
60. To, J.W.F., Z. Chen, H. Yao, J. He, K. Kim, H.H. Chou, L. Pan, J. Wilcox, Y. Cui, Z. Bao, “Ultrahigh Surface Area Three-Dimensional Porous Graphitic Carbon from Conjugated Polymeric Molecular Framework,” *ACS Central Science*, 2015.
61. Greathouse, J.A., D.L. Geatches, D.Q. Pike, H.C. Greenwell, C.T. Johnston, J. Wilcox, R.T. Cygan, “Methylene Blue Adsorption on the Basal Surfaces of Kaolinite: Structure and Thermodynamics from Quantum and Classical Molecular Simulation,” *Clay and Clay Minerals*, 63(3), 185-198, 2015.
62. McNutt, M.K., W. Abdalati, K. Caldeira, S.C. Doney, P.G. Falkowski, S. Fetter, J.R. Fleming, S. Hamburg, J.E. Penner, G. Morgan, R. Pierrehumbert, P.J. Rasch, L.M. Russell, J.T. Snow, D. Titley, **J. Wilcox**, “Climate Intervention: Reflecting Sunlight to Cool the Earth – Report from the National Research Council,” 2015.
63. McNutt, M.K., W. Abdalati, K. Caldeira, S.C. Doney, P.G. Falkowski, S. Fetter, J.R. Fleming, S. Hamburg, J.E. Penner, G. Morgan, R. Pierrehumbert, P.J. Rasch, L.M. Russell, J.T. Snow, D. Titley, **J. Wilcox**, “Climate Intervention: Carbon Dioxide Removal and Reliable Storage,” 2015.

64. Zhou, M., L. Cai, M. Bajdich, M. Garcia-Melchor, H. Li, J. He, **J. Wilcox**, W. Wu, A. Vojvodic, X. Zheng, “Enhancing Catalytic CO Oxidation over Co₃O₄ Nanowires by Substituting Co²⁺ with Cu²⁺,” *ACS Catalysis*, 5(8), 4485-4491, 2015.
65. Negreira, A.S., **J. Wilcox**, “Uncertainty analysis of mercury oxidation over a standard SCR catalyst through a lab-scale kinetic study,” *Energy & Fuels*, 29(1), 369-376, 2014.
66. **Wilcox, J.**, “Grand Challenges in Advanced Fossil Fuel Technologies,” *Frontiers in Energy Research*, 2, 47, 2014.
67. Geatches, D., D. McCarty, **J. Wilcox**, “Ab initio investigations of dioctahedral interlayer-deficient mica: Modeling particles of illite found within gas shale,” *Amer. Mineral.*, 99(10), 1962-1972, 2014.
68. Dai, S., **J. Wilcox**, J. Hoffman, J.C. Hower, “Geochemistry and Mineralogy of Coal-Fired Circulating Fluidized Bed Combustion Fly Ashes,” *Int. J. Coal Geol.*, 2014.
69. **Wilcox, J.**, A. Kirchofer, G. Glatz, J. He, P. Rochana, “Revisiting Film Theory to Consider Approaches for Enhanced Solvent-Process Design for Carbon Capture,” *Energy Environ. Sci.*, 7(5), 1769-1785, 2014.
70. **Wilcox, J.**, “Adsorption and fluid transport phenomena in gas shales and their effects on production and storage,” *Int. J. Coal Geol.*, 123, 1-1, 2014.
71. Geatches, D.L., **J. Wilcox**, “Ab initio investigations of dioctahedral interlayer-deficient mica: modeling 1 M polymorphs of illite found within gas shale,” *Eur. J. Mineral.*, 26(1), 127-144, 2014.
72. Yuan, M., K. Narakornpijit, R. Haghpanah, **J. Wilcox**, “Consideration of a Nitrogen-selective Membrane for Postcombustion Carbon Capture through Process Modeling and Optimization,” *J. Memb. Sci.*, 465, 177-184, 2014.
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77. **Wilcox, J.**, R. Haghpanah, J. He, K. Lee, E. Rupp, “Advancing Adsorption and Membrane-Based Separation Processes for the Gigaton Carbon Capture Challenge,” *Annu. Rev. Chem. Biomol. Eng.*, 5(1), 479-505, (2014). (invited by Stacey Bent, Stanford University)
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95. Liu, Y., J. Wilcox, "Effects of Surface Heterogeneity on the Adsorption of CO₂ in Microporous Carbons," *Environ. Sci. Technol.*, 46(3), 1940-1947, 2012.
96. Lim, D.H., J. Wilcox, "Mechanisms of Oxygen Reduction Reaction on Defective Graphene-Supported Pt Nanoparticles from First-Principles," *J. Phys. Chem. C*, 116(5), 3653-3660, 2012.
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101. Lim, D.H., **J. Wilcox**, "DFT-based Study on Oxygen Adsorption on Defective Graphene-Supported Pt Nanoparticles," *J. Phys. Chem. C*, 115, 22742-22747, 2011.
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103. About, S., **J. Wilcox**, G.E., Brown, Jr., "Density functional theory investigation of the interaction of water with α -Al₂O₃ and α -Fe₂O₃ (1-102) surfaces: Implications for surface reactivity," *Phys. Rev. B*, 83, 125407, 2011.
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106. Negreira, A.S., S. Aboud, **J. Wilcox**, "Surface reactivity of V₂O₅(001): Effects of vacancies, protonation, hydroxylation, and chlorination," *Phys. Rev. B*, 83, 045423, 2011.
107. Scherson, Y., **J. Wilcox**, S. Aboud, B. Cantwell, "Surface Structure and Reactivity of Rhodium Oxide (Rh₂O₃)," *J. Phys. Chem. C*, 115(22), 11036-11044, 2011.
108. D.H. Lim, A.S. Negreira, **J. Wilcox**, "Density Functional Theory Studies on the Interaction of Defective Graphene-Supported Fe and Al Nanoparticles," *J. Phys. Chem. C*, 115, 8961-8970, 2011.
109. **Wilcox, J.**, "A Kinetic Investigation of Unimolecular Reactions Involving Trace Metals at Postcombustion Flue Gas Conditions," *Environ. Chem.*, 8, 1-6, 2011.
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111. Liu, Y., **J. Wilcox**, "CO₂ Adsorption on Carbon Models of Organic Constituents of Gas Shale and Coal," *Environ. Sci. Technol.* 45(2), 809, 2010.
112. About, S., **J. Wilcox**, "A density functional theory study of the charge state of hydrogen in metal-hydrides," *J. Phys. Chem. C*, 114(24), 10978-10985, 2010.
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114. Ozdogan, E., **J. Wilcox**, "Investigation of H₂ and H₂S Adsorption on Niobium- and Copper-Doped Palladium Surfaces," *J. Phys. Chem. B*, 114, 12851-12858, 2010.
115. Padak, B., **J. Wilcox**, "Understanding Mercury Binding on Activated Carbon," *Carbon*, 47 (12), 2855-2864, 2009.
116. Sasmaz, E., S. Aboud, **J. Wilcox**, "Hg Binding on Pd Binary Alloys and Overlays," *J. Phys. Chem. C*, 113(18), 7813-7820, 2009.
117. **Wilcox, J.** "A Kinetic Investigation of High-Temperature Mercury Oxidation by Chlorine," *J. Phys. Chem. A*, 113, 6633-6639, 2009.
118. About, S., E. Sasmaz, **J. Wilcox**, "Mercury Adsorption on PdAu, PdAg, and PdCu Alloys," *Main Group Chemistry*, 7(3), 205, 2008.
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123. Sonwane, S., **J. Wilcox**, Y.H. Ma, "Solubility of Hydrogen in PdAg and PdAu Binary Alloys Using Density Functional Theory," *J. Phys. Chem. B*, 110(48), 24549, 2006.
124. **Wilcox, J.**, "Incorporating Computational Chemistry into the Chemical Engineering Curriculum," *Chem. Eng. Educ.*, 40(4), 268, 2006.
125. Padak, B., M. Brunetti, A. Lewis, **J. Wilcox**, "Mercury Binding on Activated Carbon," invited submission to *Environmental Progress*, quarterly publication of AIChE, 25(4), 319, 2006.
126. Urban, D., **J. Wilcox**, "A Theoretical Study of the Kinetics of the Reactions $\text{Se} + \text{O}_2 \rightarrow \text{SeO} + \text{O}$ and $\text{As} + \text{HCl} \rightarrow \text{AsCl} + \text{H}$," *J. Phys. Chem. A*, 110(28), 8797-8801, 2006.
127. Urban, D., **J. Wilcox**, "A Theoretical Study of Properties and Reactions Involving Arsenic and Selenium Compounds Present in Coal Combustion Flue Gases," *J. Phys. Chem. A*, 110(17), 5847-5852, 2006.
128. Fishtik, I., D. Urban, **J. Wilcox**, "The Effect of Stoichiometry on ab initio-based Thermochemistry Predictions," *Chem. Phys. Lett.*, 417, 185-189, 2006.
129. **Wilcox, J.**, P. Blowers, "Decomposition of Mercuric Chloride and Application to Combustion Flue Gases," *Environ. Chem.*, 1, 1-6, 2004.
130. **Wilcox, J.**, P. Blowers, "Correction and Improvement of Mercury Speciation Kinetics Estimates from Quantum Chemical Calculations," *J. Mol. Struct. (Theochem)*, 674, 275-278, 2004.
131. **Wilcox, J.**, D.C.J. Marsden, P. Blowers, "Evaluation of Basis Sets and Theoretical Methods for Estimating Rate Constants of Mercury Oxidation Reactions Involving Chlorine," *Fuel Proc. Technol.*, 85, 391-400, 2003.
132. **Wilcox, J.**, J. Robles, D.C.J. Marsden, P. Blowers, "Theoretically predicted rate constants for mercury oxidation by hydrogen chloride in coal combustion flue gases," *Environ. Sci. Technol.*, 37(18), 4199-4204, 2003.

SELECTED PROFESSIONAL ACTIVITIES:

- 2020 Invited Speaker on Negative Emissions, 17th Annual Meeting of STS Forum, Tokyo, Invited by Marcia McNutt
- 2020 Invited Speaker to COP-26, Workshop on Engineering and Mitigation of Climate Change, Glasgow, Scotland, recommended by National Academy of Sciences
- 2020 Invited Plenary Speaker on Removing Carbon from Air, Frontiers Forum 2020
- 2020 Invited Speaker to World Resources Institute for a Discussion on Reenergizing Climate Action on Capitol Hill, Washington, DC
- 2020 Invited Speaker on Climate Restoration, American Climate Leadership Summit, Washington, DC
- 2020 Invited Seminar on Negative Emissions, Kleinman Policy Center, U Penn, Invited by Mark Alan Hughes
- 2020 Workshop Organizer: Primer on Negative Emissions, Worcester, MA
- 2020 Invited Talk on Direct Air Capture, EDF Investors Meeting, San Francisco, Invited by Steve Hamburg
- 2019 Invited Talk on Negative Emissions to CARB, Sacramento, CA

- 2019 Invited Seminar on Negative Emissions to University of Ghent, Belgium, Invited by Mark Saeys
- 2019 Invited Talk on Direct Air Capture to Annual AGU Conference, San Francisco, Invited by Rob Jackson and Margaret Torn
- 2019 Invited Talk on Direct Air Capture for CSIS Energy Futures Forum, Washington, DC
- 2019 Invited Panel Speaker on Direct Air Capture, EFI Bipartisan Policy Forum, Washington, DC
- 2019 Invited Seminar on Direct Air Capture to Trinity Business School, Ireland
- 2019 Invited Seminar on Negative Emissions to Max Planck Institute, Germany, Invited by Kai Sundmacher
- 2019 Workshop Presenter for National Academy of Sciences on Deep Decarbonization, Washington, DC
- 2019 Conference Organizer: Negative Emissions Technologies, Edinburgh, Scotland
- 2019 Invited Talk on Direct Air Capture, Aspen Institute
- 2019 Campus-wide University Lecture on Direct Air Capture, Purdue University
- 2019 Lead Author on Carbon Capture Chapter for Report on CCS from National Petroleum Council
- 2019 Invited Talk on Negative Emissions for SLAC SUNCAT Summer School, Invited by Tom Jaramillo
- 2018 Committee Member and Chapter Lead Author: National Research Council Report on Carbon Dioxide Removal sponsored in part by the National Academy of Sciences
- 2018 Invited Speaker: CCS Leadership Forum, Calabria, Italy, Invited by Niall Mac Dowell
- 2018 Co-organizer: International Conference on Negative Emissions, Chalmers University, Gothenburg, Sweden
- 2018 Invited Speaker: TED Conference, Carbon Capture and Utilization, The Age of Amazement, Vancouver, Canada, Invited by Science Curator, David Biello
- 2018 Invited Seminar Speaker: Center for Climate and Energy Decision Making and Department of Engineering and Public Policy, Carnegie Mellon, Invited by Granger Morgan
- 2018 Invited Reviewer: Karlsruhe Institute of Technology, Review Panel for CO₂ Utilization Opportunities, Invited by Felix Studt
- 2018 Invited Speaker: Environmental Defense Fund Science Day, Hype or Hope: The Potential of Carbon Dioxide Removal, Cavallo Point at Fort Baker, Sausalito, Invited by Steve Hamburg (and recommended by Stephen Pacala)
- 2017 Conference Organizer: Carbon Capture and Reliable Storage, Calabria, Italy
- 2017 Invited Speaker: 21st Century Energy Transition Symposium, Colorado State University, Invited by Bryan Wilson
- 2017 Invited Speaker: Symposium – Plan B: Engineering a Cooler Earth, Caltech, Invited by Paul Wennberg and Supported by Charles Munger
- 2017 Invited Seminar Speaker: Department of Chemical Engineering, University of Michigan, Invited by Mark Barteau
- 2017 Invited Panel Speaker: ARPA-E Summit on Direct Air Capture, Invited by Program Director Eric Schiff
- 2016-18 Advisory Board, Carbon X-Prize
- 2016 Invited Seminar Speaker: Department of Energy, Politecnico di Milano, Invited by Stefano Consonni
- 2016 Invited Speaker: CCS Leadership Forum, Imperial College London, Invited by Niall Mac Dowell

- 2015 Invited Speaker: AAAS and Carnegie Institute, Update: Climate Science 50 Years Later, Washington, D.C., Invited by Chris Field and Marcia McNutt
- 2015/17 Invited Speaker: SUNCAT Summer Institute, Stanford, CA, Invited by Jens Norskov
- 2015 Invited Speaker: First Gordon Research Conference on CCS, MA, Invited by Berend Smit and Marco Mazzotti
- 2015 Invited Plenary Speaker: Rutgers Energy Institute Annual Symposium, NJ, Invited by Paul Falkowski
- 2015 Invited Speaker: Characterization of Porous Materials: from Angstroms to Millimeters, Quantachrome, FL, Invited by Matthias Thommes
- 2015 Invited Speaker: Carbon Negative Emissions, AAAS, San Jose, CA, Invited by Marcia McNutt
- 2015 Invited Speaker: NRC Climate Intervention Report, Chevron Climate Energy Environment Series, San Ramon, CA, Invited by Arthur Lee
- 2014 Invited Speaker: National Institute for Standards and Technology, Gaithersburg, MD
- 2014 Invited Speaker: Department of Science, Technology, and Society, Colby College, Invited by Jim Fleming
- 2014 Invited Speaker: Department of Chemical Engineering, University of Maine, Orono, Invited by Doug Ruthven
- 2014 Invited Speaker: MIT Energy Initiative, Massachusetts Institute of Technology, Invited by Howard Herzog
- 2014 Invited Speaker, Pathways to Climate Solutions: Assessing Energy Technology and Policy Innovation, Aspen, CO, Recommended by Howard Herzog
- 2014 Invited Panelist, CCS Technology Roundtable, Global CCS Institute, Canadian Embassy, Washington, D.C., Invited by Julio Friedmann
- 2014 Invited Speaker: Center for Solutions to Weather and Climate Risk, Penn State, Invited by David Titley
- 2014 Invited Speaker: Department of Chemistry, University of Iowa, Invited by Sara Mason
- 2014 Invited Speaker: Department of Chemical Engineering, Northwestern University, Invited by Randy Snurr
- 2014 Invited Speaker: Department of Chemical and Biological Engineering, King Abdullah University of Science and Technology, Kingdom of Saudi Arabia, Invited by Ingo Pinnau
- 2014 Invited Speaker: Department of Chemical Engineering, Istanbul Technical University
- 2013 Editor, Special Issue in Int. J. Coal Geol. on “Adsorption and Fluid Transport Phenomena in Gas Shales and their Effects on Production and Storage”
- 2013 Invited Speaker: Lenfest Center for Sustainable Energy, Columbia University, New York, Invited by Alissa Park and Klaus Lackner
- 2013 Invited Speaker: Chemical Engineering Department, University of Washington
- 2013/15 Invited Speaker: Department of Mechanical Engineering, High Temperature Gas Dynamics Seminar, Stanford University, Invited by Chris Edwards
- 2013 Invited Speaker: Chemical, Materials, and Petroleum Engineering Department, University of Southern California, Los Angeles, CA
- 2013 Invited Speaker: 3rd Annual Energy@Stanford & SLAC Conference, Stanford University
- 2013 Invited Speaker: Annual GCEP Research Symposium, Stanford University, Invited by Sally Benson
- 2013 Committee Member and Chapter Lead Author: National Research Council Report on Climate Engineering sponsored in part by the National Academy of Sciences

2013 Committee Member: Novim, Methane Leakage Study

2013 Invited Speaker: U.S.-Iran Symposium on Air Pollution in Megacities

2013/15 Invited Speaker: Summer School - Research Experience in Carbon Sequestration, Birmingham, Alabama, Invited by Pamela Tomski

2013 Invited Speaker and Workshop Coordinator: Virgin Earth Challenge (project sponsored by Sir Richard Branson) - Negative CO₂ Emissions Workshop, Stanford University

2013 Invited Speaker: Sustainable Napa County, Presentation on CCS at their Policymakers Summit Meeting, Napa, CA

2012 Invited Speaker: Singapore CCS/U Roadmap Workshop, National Research Foundation, Singapore, Invited by Mark Saeys

2012 The Petroleum and Petrochemical College, Held 2-day workshop on Carbon Capture and Sequestration, Bangkok, Thailand

2012 Invited Speaker: National Energy Technology Laboratory, Morgantown, West Virginia, Invited by Brian Anderson

2012 Invited Speaker: 2nd Annual Energy@Stanford & SLAC Conference, Stanford University

2012 Invited Speaker: Seminar at ARPA-E, Washington, D.C., Invited by Arun Majumdar

2012 Invited Speaker: Department of Civil and Environmental Engineering, Stanford University, Invited by Mark Jacobson

2011 Committee Member: American Physical Society, Direct Air Capture Feasibility Study

2011 Chulalongkorn University, Held 5-day workshop on Carbon Capture and Sequestration (December), Bangkok, Thailand

2011 Stanford University, Global Climate Energy Project, Lead Coordinator of Workshop on Carbon Capture (June) and Carbon Capture Tutorial (October)

2010 Invited Speaker: Department of Process and Mechanical Engineering, ETH, Zurich, Switzerland, Invited by Marco Mazzotti

2010 Invited Speaker: Department of Chemistry and Chemical Engineering, University of California, Berkeley, Invited by Berend Smit

2010 Invited Speaker: Department of Chemical Engineering, Chulalongkorn University, Bangkok, Thailand

2010 Invited Speaker: Department of Material Sciences Engineering, Stanford University, Invited by Bruce Clemens

2010 Invited Speaker: Department of Chemical Engineering, University of Montana, Invited by Joe Seymour

2009 Invited Speaker: Chevron, Richmond, CA, Invited by Arthur Lee

2009 Invited Speaker: Midwest Thermodynamics and Statistical Conference, Detroit, Michigan, Invited by Jeff Potoff

2009 Invited Speaker: Electric Power Research Institute, Workshop on Fundamental Challenges on CO₂ Capture, Chicago, Illinois

2009 Invited Speaker: School of Engineering Advances Junior Scientist Program, University of Arizona, Tucson, Arizona, Invited by PhD advisor, Paul Blowers

2008 Invited Speaker, Department of Physics, Technical University of Munich, Germany, Invited by Ulrich Stimming

2008 Invited Speaker: Lockheed Martin, Palo Alto, CA

2008 Invited Speaker: Department of Chemical Engineering, Columbia University, New York City, New York, Invited by Faye McNeil

2008 Invited Speaker: Energy Seminar, Stanford University

- 2008 Invited Speaker: Corning Inc., Mercury Oxidation Catalysts and Sorbents on Coal Flue Gas, Corning, New York
- 2008 Invited Speaker: SUNRISE Lecture Series, Minimizing Environmental Impacts of Coal-based Energy Generation, University of North Dakota, Grand Forks
- 2007 Invited Speaker: National University of Singapore, Department of Chemical Engineering, Singapore, Invited by Mark Saeys
- 2007 Invited Panel Speaker: DOE Mercury Control Technology Conference, Pittsburgh, Pennsylvania, Invited by Evan Granite
- 2006 Invited Speaker: Aerodyne Research Inc., Direct Measurements of Mercury in Simulated Combustion Flue Gas, Billerica, Massachusetts
- 2006 Invited Speaker: Chulalongkorn University, Center of Excellence in Particle Technology, Bangkok, Thailand
- 2005 Invited Speaker, Department of Chemical Engineering, University of Utah, Salt Lake City, Utah, Invited by PhD advisor, Jost O.L. Wendt
- 2005 Invited Speaker, Environmental Protection Agency, Modeling Trace Metal Emissions from Combustion, Research Triangle Park, North Carolina, Invited by Nick Hutson

SCHOLARSHIPS AWARDED AS PI:

<u>Funding Period</u>	<u>Award Title</u>	<u>Sponsor</u>	<u>Amount</u>
2020-21	Enhancing Kinetics of CO ₂ Mineralization	ARPA-E SEED	500,000
2020-21	Magnesium Looping of CO ₂	Grantham Institute	400,000
2020-21	Developing a Primer on Negative Emissions	Sloan Foundation	20,000
2019-20	Global Mapping of Carbon Dioxide Removal	Environmental Defense Fund	100,000
2019	Workshop on Negative Emissions	National Science Foundation	31,000
2018	N ₂ Membrane Technology for Ammonia Synthesis	OTL, CO School of Mines	15,000
2017-18	Distributed Power & CO ₂ Storage Reformer	Colorado Energy Research	25,000
2017-18	CO ₂ Conversion Processes	X-Prize	3,000
2017	International Conference on CCUS Deployment	National Science Foundation	15,000
2016-19	DFT Studies of H ₂ /N ₂ Saturation	Air Force	348,000
2015-17	Material Testing for Mercury Uptake	Alstom	150,000
2013-16	Catalytic Membranes for N ₂ Separation	National Science Foundation	324,999
2015-16	N ₂ -Selective Separation with Membrane Reactor	DOE-NETL	150,000
2011-16	CO ₂ Storage Potential of Gas Shales	Stanford Consortium on CCS	160,000
2012-15	Trace Metals Interactions with Fly Ash	National Science Foundation	327,001
2012-15	Biomimetic Sorbents for Carbon Capture	Global Climate Energy Project	1,368,665
2014-15	Enhancing of Hydride Thermodynamics	Global Climate Energy Project	100,000
2009-13	Experimental Mercury Adsorption on Carbons	Electric Power Research Institute	405,833
2011-13	Preventing Mercury Release into Atmosphere	United Postal Service	91,800
2011-12	Carbon-based Sorbents for Carbon Capture	Global Climate Energy Project	99,897
2011-12	Gas Adsorption and Diffusion in Group V Metals	Army Research Office	150,000
2011-12	Life Cycle Efficiency of Mineral Carbonation	National Renewables Energy Lab	37,031
2010-12	N ₂ -Selective Membranes for Ammonia Synthesis	National Science Foundation	123,284
2010-11	Mercury Adsorption on Carbon Sorbents	SolmeteX, Inc	15,000
2010-11	Nitrogen Membranes for Carbon Capture	Environmental Protection Agency	10,000
2006-07	PRF YIP: Heterogeneous Mercury on Carbon	American Chemical Society	40,000
2006-07	Arsenic and Selenium Adsorption on Metals	Environmental Protection Agency	10,000
2006-10	YIP: Alloy Design for H ₂ Separation	Army Research Office	350,000
2005-10	CAREER: Preventing As and Se Release	National Science Foundation	400,000
2004-05	Ab initio Investigation of Hg-Br Reactions	Environmental Protection Agency	35,000

GIFT FUNDS AWARDED AS PI (Reduced Overhead and No Contract):

Funding Period	Subject of Work	Sponsor	Amount
2020	Carbon Capture Research	Hewlett Foundation	200,000
2019	Negative Emissions Research	Prime Energy Fund	65,000
2018-19	Negative Emissions Research	ClimateWorks Foundation	165,000
2017-18	Mineral Carbonation Research	Community Energy	55,000
2016	Carbon Capture Research	Ferus	15,000
2011-15	Mercury Sorbent Research	Novinda	239,341
2013-14	Mercury Sorbent Research	Cabot	15,000
2013-14	Mercury Sorbent Research	ADA	20,000
2009-15	Carbon Capture and Storage Research	Chevron	300,000

SCHOLARSHIPS AWARDED AS CO-PI:

Funding Period	Award Title	Sponsor	Amount (as Co-PI)
2017-18	Renewable Electricity-Powered CO ₂ Conversion PI (Opus 12)	ARPA-E	125,000
2011-15	Enhancing Natural Gas Recovery in Shales with CO ₂ PI (Mark Zoback)	BP	336,028
2013-14	Characterization of Gas Shales PI (Mark Zoback)	Aramco	24,506
2011-13	Modeling Nanoparticle Catalysts for Water Splitting PI (Stacey Bent)	DOE-EFRC-CNEEC	184,476
2011-12	Trace Metal and Ash Deposition on Land PI (Scott Fendorf)	Woods Institute	30,000
2010-12	Feasibility of CO ₂ Storage in Gas Shales PI (Mark Zoback)	DOE-NETL	339,343
2009-11	Nanocatalysts for Liquid Fuel Combustion PI (Ilhan Iksay, Princeton)	Air Force	242,375
2005-08	Modeling H ₂ Permeation in Pd Membranes PI (Yi Hua Ma, WPI)	Shell	300,000

Approximate Total Funds Raised from 2005-present ~ \$8.5M

ADVISEES RECEIVING DEGREES:

Year	Name and Dissertation or Thesis Title	Degree	Place of Employment
2015-2020	Kian Kourosch, Low-Carbon Hydrogen Production	Ph.D.	DOE
2012-2017	Mengyao Yuan, Membrane Technology for Low-Carbon Energy Systems	Ph.D.	E3
2009-2016	Bryce Anzelmo, On-Board H ₂ Production with CO ₂ Capture	Ph.D.	LytEn
2009-2016	Kyoungjin Lee, Synthesis and Testing of N ₂ -Selective Membranes	Ph.D.	Applied Materials
2009-2016	Ji-Eun Jung, Sorbent Design for Hg Capture	Ph.D.	Samsung Electronics
2014-2016	Panunya Charoensawadpong, Potential of CO ₂ Utilization for Enhanced Oil Recovery	M.S.	PTT, Bangkok

2014-2016	Praveen Bains, Opportunities for CO ₂ Utilization in the U.S.	M.S.	Imperial College
2009-2015	Jiajun He, Sorbent Design and Testing for CO ₂ Separation	Ph.D.	U of Illinois
2008-2013	Abby Kirchofer, Molecular-to-Process Level Approach to Advancing Carbon Capture and Storage	Ph.D.	Chevron
2007-2013	Ana Suarez Negreira, Mechanism of Mercury Oxidation Across SCR Catalysts	Ph.D.	U Texas, Dallas
2011-2013	Kumnoon Narakornpijit, Optimization of Membrane Separation for Post-Combustion Capture of CO ₂	M.S.	PTT, Bangkok
2008-2012	Ekin Ozdogan, Theoretical and Experimental Investigations of Metallic Membranes for CO ₂ Capture	Ph.D.	Shell
2007-2012	Panithita Rochana, Computational Catalysis for Carbon Capture and Utilization	Ph.D.	PTT, Bangkok
2007-2012	Yangyang Liu, Fundamental Investigations of Gas Adsorption in Micro and Mesopores	Ph.D.	BP
2005-2011	Erdem Sasmaz, Mercury Adsorption and Oxidation Catalysis	Ph.D.	U South Carolina
2005-2011	Bihter Padak, Direct Mercury Measurements in Coal-Fired Flue Gas Emissions	Ph.D.	U Cal Irvine
2009-2011	Keith Mosher, Predicting Methane Adsorption in Carbon Slit Pores using GCMC	M.S.	1-Block Off the Grid
2009-2011	Ondra Sestak, Measuring Mercury Oxidation on Precious-Metal Catalysts	M.S.	Shell
2006-2008	Terumi Okano, Homogeneous Mercury Oxidation via Bromine	M.S.	Dow Chemical
2005-2007	David Urban, Selenium and Arsenic Capture in Coal-Combustion Flue Gas	M.S.	ExxonMobil

PATENTS:

- P1. Wilcox, J. Nitrogen-Permeable Membrane and Uses Thereof, U.S. Patent Application No. 13/011,748, 2011.
- P2. Wilcox, J., D.T. Stack, Z. Bao, J. He, J. Tao, G. Brannon, Sorbents for Carbon Dioxide Capture, U.S. Patent Application No. 9,155,996, 2015.
- P3. King, P.E., Wilcox, J., Nitrogen Extraction from a Gaseous Carbon Dioxide Reactant Stream, U.S. Patent Application No. 10,053,634, 2018.
- P4. Wilcox, J., Liguori, S., Ammonia Synthesis Using a Catalytic Nitrogen-Selective Membrane, U.S. Patent Application No. 10,556,803, 2020.

TEACHING EXPERIENCE:

Carbon Capture and Sequestration Fall 2019, Worcester Polytechnic Institute
Fundamental Separations Processes Spring 2019/20, Worcester Polytechnic Institute
Carbon Capture and Sequestration Spring 2016, Colorado School of Mines
Introduction to Petroleum Engineering Fall 2009-2013, Stanford University
Carbon Capture and Sequestration Fall 2009-2013, Stanford University
Electronic Structure and Application to Chemical Kinetics Win 2009-2013/15, Stanford University
Renewable Energy Processes Win 2011/12/13, Stanford University

Chemical Kinetics Win 2005-2008, Worcester Polytechnic Institute
Fluid Mechanics Fall 2004-2008, Worcester Polytechnic Institute

UNIVERSITY SERVICE:

2014 Committee Member, Report on SLAC-Stanford Energy Task Force
2014 Member, School of Earth Sciences Teaching Task Force
2013-14 Chemical Engineering Search Committee for Tenure-Track Position
2012-2015 Advisor, Undergraduate Program in Energy Resources Engineering
2011-2012 Member, School of Earth Sciences Council, Stanford University
2010-present Member, Lab Safety Committee, Energy Resources Engineering
2009-present Member, Graduate Admissions Committee, Energy Resources Engineering
2009-present Defense committee chair in chemistry (×3), mechanical engineering (×8), civil engineering (×3), chemical engineering (×4), and geophysics (×3) departments

EXTERNAL SERVICE:

2020-present Committee Member, National Academy of Sciences Report on Deep Decarbonization
2020-present Associate Editor, *Chemical Engineering Journal*
2020-present Member of Scientific Council of the CarMa Chair, IFP School, Paris
2019-present Specialty Chief Editor, *Frontiers Climate journal on Negative Emissions*
2018-present Brain Trust Member, Helena Group
2018/2020 Organizing Committee, Conference on Negative Emissions, Gothenburg, Sweden
2017-present Scientific Advisory Board, Carbon 180
2014-present Associate Editor, *Energy & Fuels*
2016-2019 Committee Member and Lead Author, National Academy of Sciences Report on Carbon Dioxide Removal
2013-2014 Committee Member: NRC/NAS Study on Climate Intervention
2013 Committee Member: Novim Study on Methane Leakage
2013 Reviewer, New Gordon Research Conference on Carbon Capture, Utilization, and Storage
2011-2014 Co-chair: Membrane Transport, Annual NAMS Conference
2010-2013 Advisory Board Member, C12 Energy
2010-2011 Committee Member: APS Study on Feasibility of Direct Air Capture
2005-present Reviewer, NSF Panels, Combustion & Plasma (×6); Catalysis & Biocatalysis (×4); Chemical & Biological Separation (×3); Sustainability (×2)

CURRENT MEMBERSHIPS:

- American Institute for Chemical Engineers (AIChE)
- American Association for the Advancement of Science (AAAS)
- American Chemical Society (ACS)
- North American Membrane Society (NAMS)
- The Ninety-Nines, Inc – International Organization of Women Pilots