

Douglas A. Reed, Ph.D.

Assistant Professor, University of Washington, Department of Chemistry
Email: dreed4@uw.edu | Phone: (206) 543-7099 | Website: www.reedresearch.org

EDUCATION

University of California, Berkeley, Ph.D. in Chemistry, 2018

Advisor: Professor Jeffrey Long

Harvard University, A.B. in Chemistry and Physics, 2012

PROFESSIONAL APPOINTMENTS

University of Washington, Assistant Professor of Chemistry, 2022–Present

University of Washington, Senior Research Scientist, 2021–present

Columbia University, Postdoctoral Research Fellow, 2018–2021

Advisors: Professor Colin Nuckolls and Professor Xavier Roy

AWARDS and HONORS

SciLog Fellow, Negative Emissions Science, 2022

Reaxys Ph.D. Prize Finalist, 2019

DOE EFRC Ten at Ten Scientific Ideas Award, 2019

Columbia Nano Initiative Postdoctoral Fellowship, 2018–2021

National Science Foundation Graduate Research Fellowship, 2013–2016

Harvard College Research Program Grant, 2010–2012

PUBLICATIONS

- 16) **Site-Selective Surface Modification of Superatomic 2D Re₆Se₈.**
He, S.; Evans, A. M.; Meirzadeh, E.; Han, S. Y.; Russell, J. C.; Wiscons, R. A.; Bartholomew, A. K.; **Reed, D. A.**; Zangiabadi, A.; Steigerwald, M. L.; Nuckolls, C.; Roy, X.
J. Am. Chem. Soc. **2022**, *144*, 74–79.
- 15) **Controlling Ligand Coordination Spheres and Cluster Fusion in Superatoms.**
Reed, D. A.; Hochuli, T. J.; Gadjeva, N. A.; He, S.; Wiscons, R. A.; Bartholomew, A. K.; Champsaur, A. M.; Steigerwald, M. L.; Roy, X.; Nuckolls, C.
J. Am. Chem. Soc. **2022**, *144*, 306–313.
- 14) **High Performance Organic Pseudocapacitors via Molecular Contortion.**
Russell, J. C.; Posey, V.; Gray, J.; May, R.; **Reed, D. A.**; Marbella, L.; Steigerwald, M. L.; Yang, Y.; Roy, X.; Nuckolls, C.; Peurifoy, S. R.
Nat. Mater. **2021**, *20*, 1136–1141.
- 13) **Single-Electron Currents in Designer Single-Cluster Devices.**
Gunasekaran, S.#; **Reed, D. A.**#; Paley, D. W.; Bartholomew, A. K.; Venkataraman, L.; Steigerwald, M. L.; Roy, X.; Nuckolls, C. # = equal contribution
J. Am. Chem. Soc. **2020**, *142*, 14924–14932.
- 12) **Negative Cooperativity Upon Hydrogen Bond-Stabilized O₂ Adsorption in a Redox-Active Metal–Organic Framework.**
Oktawiec, J.; Jiang, H. Z. H.; Vitillo, J. G.; **Reed, D. A.**; Darago, L. E.; Trump, B. A.; Bernales, V.; Li, H.; Colwell, K. A.; Furukawa, H.; Brown, C. M.; Gagliardi, L.; Long, J. R.
Nat. Commun. **2020**, *11*, 3087.
- 11) **Selective Nitrogen Adsorption via Backbonding in a Metal–Organic Framework with Exposed Vanadium Sites.**
Jaramillo, D. E.#; **Reed, D. A.**#; Jiang, H. Z. H.; Oktawiec, J.; Mara, M. W.; Forse, A. C.; Lussier, D. J.; Murphy, R. A.; Cunningham, M.; Colombo, V.; Shuh, D. K.; Reimer, J. A.; Long, J. R. # = equal contribution
Nat. Mater. **2020**, *19*, 517–521.
- 10) **Biomimetic O₂ Adsorption in an Iron Metal–Organic Framework for Air Separation.**
Reed, D. A.; Xiao, D. J.; Jiang, H. Z. H.; Chakarawet, K.; Oktawiec, J.; Long, J. R.
Chem. Sci. **2020**, *11*, 1698–1702.

- 9) **Hierarchical Coherent Phonons in a Superatomic Semiconductor.**
Lee, K.; Maehrlein, S. F.; Zhong, X.; Meggiolaro, D.; Russell, J. C.; **Reed, D. A.**; Choi, B.; De Angelis, F.; Roy, X.; Zhu, X.
Adv. Mater. **2019**, *31*, 1903209.
- 8) **Cooperative Adsorption of Carbon Disulfide in Diamine-Appended Metal–Organic Frameworks.**
McGuirk, C. M.; Siegelman, R. L.; Drisdell, W. S.; Runčevski, T.; Milner, P. J.; Oktawiec, J.; Wan, L. F.; Su, G. M.; Jiang, H. Z. H.; **Reed, D. A.**; Gonzalez, M. I.; Prendergast, D.; Long, J. R.
Nat. Commun. **2018**, *9*, 5133.
- 7) **Enabling Alternative Ethylene Production through Its Selective Adsorption in the Metal–Organic Framework Mn₂(*m*-dobdc).**
Bachman, J. E.; **Reed, D. A.**; Kapelewski, M. T.; Chachra, G.; Jonnavittula, D.; Radaelli, G.; Long, J. R.
Energy Environ. Sci. **2018**, *11*, 2423–2431.
- 6) **Separation of Xylene Isomers through Multiple Metal Site Interactions in Metal–Organic Frameworks.**
Gonzalez, M. I.; Kapelewski, M. T.; Bloch, E. D.; Milner, P. J.; **Reed, D. A.**; Hudson, M. R.; Mason, J. A.; Barin, G.; Brown, C. M.; Long, J. R.
J. Am. Chem. Soc. **2018**, *140*, 3412–3422.
- 5) **M₂(*m*-dobdc) (M = Mn, Fe, Co, Ni) Metal–Organic Frameworks as Highly-Selective, High-Capacity Adsorbents for Olefin/Paraffin Separations.**
Bachman, J. E.; Kapelewski, M. T.; **Reed, D. A.**; Gonzalez, M. I.; Long, J. R.
J. Am. Chem. Soc. **2017**, *139*, 15363–15370.
- 4) **A Spin Transition Mechanism for Cooperative Adsorption in Metal–Organic Frameworks.**
Reed, D. A.[#]; Keitz, B. K.[#]; Oktawiec, J.; Mason, J. A.; Runčevski, T.; Xiao, D. J.; Darago, L. E.; Crocellà, V.; Bordiga, S.; Long, J. R. [#] = equal contribution
Nature **2017**, *550*, 96–100.
- 3) **Olsalazine-Based Metal–Organic Frameworks as Biocompatible Platforms for H₂ Adsorption and Drug Delivery.**
Levine, D. J.; Runčevski, T.; Kapelewski, M. T.; Keitz, B. K.; Oktawiec, J.; **Reed, D. A.**; Mason, J. A.; Jiang, H. Z. H.; Colwell, K. A.; Legendre, C.; FitzGerald, S. A.; Long, J. R.
J. Am. Chem. Soc. **2016**, *138*, 10143–10150.
- 2) **Reversible CO Scavenging via Adsorbate-Dependent Spin State Transitions in an Iron(II)–Triazolate Metal–Organic Framework.**
Reed, D. A.; Xiao, D. J.; Gonzalez, M. I.; Darago, L. E.; Herm, Z. R.; Grandjean, F.; Long, J. R.
J. Am. Chem. Soc. **2016**, *138*, 5594–5602.
- 1) **Design of a Metal–Organic Framework with Enhanced Back Bonding for Separation of N₂ and CH₄.**
Lee, K.; Isley III, W. C.; Dzubak, A. L.; Verma, P.; Stoneburner, S. J.; Lin, L. C.; Howe, J. D.; Bloch, E. D.; **Reed, D. A.**; Hudson, M. R.; Brown, C. M.; Long, J. R.; Neaton, J. B.; Smit, B.; Cramer, C. J.; Truhlar, D. G.; Gagliardi, L.
J. Am. Chem. Soc. **2014**, *136*, 698–704.

PATENTS and PATENT APPLICATIONS

- 2) **A Vanadium Metal–Organic Framework for Selective Adsorption.**
Long, J. R.; Jaramillo, D. E.; **Reed, D. A.**
US Patent No. 11,311,856. Published April 26, 2022.
- 1) **Selective, Adsorbate-Induced Spin Changes in Transition Metal Metal–Organic Frameworks.**
Long, J. R.; Keitz, B. K.; **Reed, D. A.**
US Patent No. 11,517,878. Published December 6, 2022.

TEACHING EXPERIENCE

As instructor:

Chem 416/516: Transition Metals, Fall 2022 (Course Evaluation Median: 4.7/5)

Chem 317: Inorganic Chemistry Laboratory, Spring 2023

OUTREACH ACTIVITIES

At University of Washington:

Math and Science Upward Bound Program, Lecturer, 2022–Present

Project SHORT, Mentor, 2021–Present

Prior to UW:

“Getting into Graduate School” Panel Series, Panelist, 2020–2021

March Materials Madness, Volunteer, 2019–2020

Girls’ Science Day, Volunteer, 2018–2020

Science Honors Program, Lecturer for high-school level course on Nanoscience, Volunteer, 2018–2019

Amgen Scholars Summer Research Program, Mentor, 2014

LIFT-Cambridge, Volunteer, Web Manager, 2009–2011

SERVICE

Admissions and Recruiting Committee, 2022–Present

Diversity and Equity Steering Committee, 2022–Present

OTHER EXPERIENCE

Cleantech to Market, University of California, Berkeley Haas School of Business and Opus 12, 2016

Research Intern, Corning Incorporated, Systems Engineering Research Division, 2009