Douglas A. Reed

Senior Research Scientist, University of Washington, Department of Chemistry
Email: dreed4@uw.edu

PROFFESSIONAL APPOINTMENTS

University of Washington, Assistant Professor, Department of Chemistry, starting 2022

University of Washington, Senior Research Scientist, 2021–present

Columbia University, Postdoctoral Research Fellow, 2018–2021
Advisors: Professor Colin Nuckolls and Professor Xavier Roy
Topic: Superatomic single-molecule electronics and two-dimensional materials

EDUCATION

University of California, Berkeley, Ph.D. in Chemistry, 2018
Advisor: Professor Jeffrey R. Long
Topic: Gas separations in metal–organic frameworks bearing open metal sites

Harvard University, A.B. in Chemistry and Physics, 2012
Advisor: Professor Theodore A. Betley

AWARDS and HONORS

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

Robert C. Byrd Scholar, 2008–2012

PUBLICATIONS

16) **Site-Selective Surface Modification of Superatomic 2D Re_6Se_8.**
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.; Gadjieva, 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 O_2 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 O_2 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.
Selected as an Editor's Highlight in Nature Communications.

7) **Enabling Alternative Ethylene Production through Its Selective Adsorption in the Metal–Organic Framework Mn_2(*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.
Selected as a 2018 Energy Environ. Sci. HOT Article.

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) **M_2(*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.
Highlighted by the US Department of Energy and Berkeley News.

3) **Olsalazine-Based Metal–Organic Frameworks as Biocompatible Platforms for H_2 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.
Highlighted in Science Editor's Choice.

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.
Highlighted in JACS Spotlights.

1) **Design of a Metal–Organic Framework with Enhanced Back Bonding for Separation of N_2 and CH_4.**
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 Application No. 16/767,488. Filed May 27, 2020.

1) **Selective, Adsorbate-Induced Spin Changes in Transition Metal Metal–Organic Frameworks**.
Long, J. R.; Keitz, B. K.; **Reed, D. A.**
US Patent Application No. 16/089,199. Filed Sept 26, 2018.

TEACHING EXPERIENCE

As teaching assistant:

Chemistry 3B: Organic Chemistry II, Fall 2012, Fall 2013, and Spring 2015, UC Berkeley

Chemistry 3BL: Organic Chemistry II Lab, Fall 2012, Fall 2013, and Spring 2015, UC Berkeley

Chemistry E-2b: Organic Chemistry II, Spring 2012, Harvard University

Chemistry E-2a: Organic Chemistry I, Fall 2011, Harvard University

Chemistry S-20a: Organic Chemistry I, Summer 2011, Harvard University

Chemistry S-20b: Organic Chemistry II, Summer 2011, Harvard University

OUTREACH ACTIVITIES

Project SHORT, Mentor, 2021–Present

"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

OTHER EXPERIENCE

Cleantech to Market, University of California, Berkeley Haas School of Business and Opus 12, 2016
Topic: Performed market research for the Bay area-based startup Opus 12 for emerging electrochemical CO_2 reduction technology

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