Jason J. Calvin

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PROFESSIONAL APPOINTMENTS

Assistant Professor of Chemistry 2025 – Present
University of Miami *Coral Gables, Florida*

Postdoctoral Fellow 2022 – 2025
Harvard University *Cambridge, Massachusetts*

EDUCATION

University of California, Berkeley 2022
Doctorate of Philosophy in Chemistry
Organic Ligands and Colloidal Nanocrystal Surface Thermodynamics

Brigham Young University 2018
Major: Chemistry, Bachelor of Science
Minors: Physics, Mathematics

PUBLICATIONS

- Chen, F.E.; Braun, J.D.; Seo, J.; Hurd, H.J.; Wenny, M.B.; Zheng, S.; Calvin, J.J.; Brown, C.M.; Mason, J.M. Manipulating hydrocarbon chain-melting transitions in dialkylammonium halide barocaloric materials through desymmetrization. *J. Am. Chem. Soc.* **2025**, *147*(23), 19788–19795.
- Calvin, J.J.; Brewer, A.S.; Alivisatos, A.P. Thermodynamics and modeling of collective effects in the organic ligand shell of colloidal quantum dots. *Acc. Chem. Res.* **2025**, *58*(2), 271–280.
- Calvin, J.J.; DelRe, C.; Erdosy, D.P.; Cho, J.; Hong, H.; Mason, J.A. Thermodynamics of polyethylene glycol intrusion in microporous water. *Nano Lett.* **2024**, *24*(49), 15896–15903.
- Calvin, J.J.; Sedlak, A.B.; Brewer, A.S.; Kaufman, T.M.; Alivisatos, A.P. Evidence and structural insights into a ligand-mediated phase transition in the solvated ligand shell of quantum dots. *ACS Nano* **2024**, *18*(36), 25257–25270.
- Dahl, J.C.; Curling, E.B.; Loipersberger, M.; Calvin, J.J.; Head-Gordon, M.; Chan, E.M.; Alivisatos, A.P. Precursor chemistry of lead bromide perovskite nanocrystals. *ACS Nano* **2024**, *18*(33), 22208–22219.
- Calvin, J.J.; Brewer, A.S.; Crook, M.F.; Kaufman, T.M.; Alivisatos, A.P. Observation of negative surface and interface energies of quantum dots. *Proc. Natl. Acad. Sci. U.S.A.* **2024**, *121*(18), e2307633121.
- Brewer, A.S.; Calvin, J.J.; Alivisatos, A.P. Impact of uniform facets on the thermodynamics of ligand exchanges on colloidal quantum dots. *J. Phys. Chem. C* **2023**, *127*(21), 10270–10281.
- McKeown-Green, A.S.; Ondry, J.C.; Crook, M.F.; Calvin, J.J.; Alivisatos, A.P. Examining the role of chloride ligands on defect removal in imperfectly attached semiconductor nanocrystals for 1D and 2D attachment cases. *J. Phys. Chem. C* **2023**, *127*(16), 7740–7751.

- Calvin, J.J.; Ben-Moshe, A.; Curling, E.B.; Brewer, A.S.; Sedlak, A.B.; Kaufman, T.M.; Alivisatos, A. P. Thermodynamics of the adsorption of cadmium oleate to cadmium sulfide quantum dots and implications of a dynamic ligand shell. *J. Phys. Chem. C* **2022**, *126*(30), 12958–12971.
- Calvin, J.J.; Brewer, A.S.; Alivisatos, A.P. The role of organic ligand shell structures in colloidal nanocrystal synthesis. *Nat. Synth.* **2022**, *1*(2), 127–137.
- Calvin, JJ.; Ondry, J.C.; Dahl, J.C.; Sedlak, A.B.; McKeown-Green, A.S.; Wang, X.; Crook, M.F.; Gleason, S.P.; Hauwiller, M.R.; Baranger, A.M.; Alivisatos, A.P. Research group-led undergraduate research program: Analyzing and improving a versatile springboard for first-year undergraduates. *J. Chem. Ed.* **2022**, *99*(2), 799–809.
- Dickson, M.S.; Rosen, P.F., Neilsen, G.; Calvin, J.J.; Navrotsky, A.; Woodfield, B.F. Heat capacity and thermodynamic functions of partially dehydrated sodium and zinc zeolite A (LTA). *Am. Mineral.* **2022**, *106*(8), 1341–1348.
- Calvin, J.J.; Kaufman, T.M.; Sedlak, A.B.; Crook, M.F.; Alivisatos, A.P. Observation of ordered organic capping ligands on semiconducting quantum dots via powder X-ray diffraction. *Nat. Commun.* **2021**, *12*, 2663.
- Rosen, P.F.; Calvin, J.J.; Woodfield, B.F.; Smolyaninova, V.N.; Prestigiacomo, J.C.; Osofsky, M.S.; Smolyaninov, I.I. Normal state specific heat of a core-shell aluminum-alumina metamaterial composite with enhanced T_c. *Phys. Rev. B* **2021**, *103*(2), 024512.
- Calvin, J.J.; O'Brien, E.A.; Sedlak, A.B.; Balan, A.D.; Alivisatos, A.P. Thermodynamics of coverage dependent ligand exchange on the surfaces of colloidal InP quantum dots. *ACS Nano* **2021**, *15*(1), 1407–1420.
- Calvin, J.J.; Swabeck, J.K.; Sedlak, A.B.; Kim, Y.; Jang, E.; Alivisatos, A.P. Thermodynamic investigation of increased luminescence in indium phosphide quantum dots by treatment with metal halide salts. *J. Am. Chem. Soc.* **2020**, *142*(44), 18897–18906.
- Hauwiller, M.R.; Ye, X.; Jones, M.R.; Chan, C.M.; Calvin, J.J.; Crook, M.F.; Zheng, H.; Alivisatos, A.P. Tracking the effects of ligands on oxidative etching of gold nanorods in graphene liquid cell electron microscopy. *ACS Nano* **2020**, *14*(8), 10239–10250.
- Rosen, P.F.; Dickson, M.S.; Calvin, J.J.; Ross, N.L.; Friščić, T.; Navrotsky, A.; and Woodfield, B.F. Thermodynamic evidence of structural transformations in CO_2-loaded metal–organic framework $Zn(MeIm)_2$ from heat capacity measurements. *J. Am. Chem. Soc.* **2020**, *142*(10), 4833–4841.
- Chen, J.; Calvin, J.J.; King, S.W.; Woodfield, B.F.; Navrotsky, A. Energetics of porous amorphous low-k SiOCH dielectric films. *J. Chem. Thermodyn.* **2019**, *139*, 105885.
- Dickson, M.S.; Calvin, J.J.; Rosen, P.F.; Woodfield, B.F. Low-temperature heat capacity measurements on insulating powders sealed under pressure. *J. Chem. Thermodyn.* **2019**, *136*, 170–179.
- Rosen, P.F.; Calvin, J.J.; Dickson, M.S.; Katsenis, A.D.; Friščić, T.; Navrotsky, A.; Ross, N.L.; Kolesnikov, A.I.; Woodfield, B.F. Heat capacity and thermodynamic functions of crystalline forms of the metal–organic framework zinc 2-methylimidazolate, $Zn(MeIm)_2$. *J. Chem. Thermodyn.* **2019**, *136*, 160–169.
- Hauwiller, M.R.; Ondry, J.C.; Calvin, J.J.; Baranger, A.M.; Alivisatos, A.P. Translatable research group-based undergraduate research program for lower-division students. *J. Chem. Ed.* **2019**, *96*(9), 1881–1890.
- Asplund, M.; Calvin, J.J.; Zhang, Y.; Huang, B.; Woodfield, B.F. Heat capacity and thermodynamic functions of γ-Al_2O_3 synthesized from $Al(NO_3)_3$. *J. Chem. Thermodyn.* **2019**, *132*, 295–305.

- Calvin, J.J.; Rosen, P.F.; Smith, S.J.; Woodfield, B.F. Heat capacities and thermodynamic functions of the ZIF organic linkers imidazole, 2-methylimidazole, and 2-ethylimidazole. *J. Chem. Thermodyn.* **2019**, *132*, 129–141.
- Skotnicki, M.; Drogoń, A.; Calvin, J.J.; Rosen, P.F.; Woodfield, B.F.; Pyda, M. M. Heat capacity and enthalpy of indapamide. *Thermochim. Acta* **2019**, *647*, 36–43.
- Calvin, J.J.; Rosen, P.F.; Ross, N.L.; Navrotsky, A.; Woodfield, B.F. Review of surface water interactions with metal oxide nanoparticles. *J. Mat. Res.* **2019**, *34*(3), 416–427.
- Chen, J.; Calvin, J.J.; Asplund, M.; King, S.W.; Woodfield, B.F.; Navrotsky, A. Heat capacities, entropies, and Gibbs free energies of formation of low-k amorphous Si(O)CH dielectric films and implications for stability during processing. *J. Chem. Thermodyn.* **2019**, *128*, 320–335.
- Chen, J.; Niu, M.; Calvin, J.J.; Asplund, M.; King, S.W.; Woodfield, B.F.; Navrotsky, A. Thermodynamics of amorphous SiN(O)H dielectric films synthesized by plasma-enhanced chemical vapor deposition. *J. Am. Ceram. Soc.* **2018**, *101*(5), 2017–2027.
- Calvin, J.J.; Asplund, M.; Zhang, Y.; Huang, B.; Woodfield, B.F. Heat capacity and thermodynamic functions of boehmite (AlOOH) and silica-doped boehmite. *J. Chem. Thermodyn.* **2018**, *118*, 338–345.
- Asplund, M.; Calvin, J.J.; Zhang, Y.; Huang, B.; Woodfield, B.F. Heat capacity and thermodynamic functions of silica-doped γ-Al_2O_3. *J. Chem. Thermodyn.* **2018**, *118*, 165–174.
- Calvin, J.J.; Asplund, M.; Akimbekov, Z.; Ayoub, G.; Katsensis, A.D.; Navrotsky, A.; Friščić, T.; Woodfield, B.F. Heat capacity and thermodynamic functions of crystalline and amorphous forms of the metal organic framework zinc 2-ethylimidazolate, $Zn(EtIm)_2$. *J. Chem. Thermodyn.* **2018**, *116*, 341–351.
- Calvin, J.J.; Asplund, M.; Zhang, Y.; Huang, B.; Woodfield, B.F. Heat capacity and thermodynamic functions of γ-Al_2O_3. *J. Chem. Thermodyn.* **2017**, *112*, 77–85.

PRESENTATIONS

- Organic Ligands and Colloidal Nanocrystal Surface Thermodynamics
  Harvard University, Chemistry and Chemical Biology Chem Talks *September 2024*
- Synthesis of Biocompatible Microporous Water and Application to Organ Perfusion
  American Chemical Society Fall 2024 *August 2024*
- Polymer Interactions with Microporous Water and the Role of Framework Defects
  American Chemical Society Fall 2024 *August 2024*
- Elimination of Structural Defects in Microporous Water and their Impact on Oxygen Capacity and Guest Interactions
  Harvard University, Chemistry and Chemical Biology Symposium *May 2024*
- Thermodynamic Driving Forces for Polymer Infiltration of Microporous Water
  American Chemical Society Fall 2023 *August 2023*
- Observation of Negative Surface and Interface Energies of Quantum Dots
  Materials Research Society Fall 2022 *December 2022*
- Organic Ligands and Colloidal Nanocrystal Surface Thermodynamics
  The University of California, Berkeley, Kavli ENSI Research Seminar *April 2022*
- Organic Ligand Shell Structure in Colloidal Quantum Dots Revealed Through Isothermal Titration Calorimetry, Quantitative ^{1}H NMR, and X-ray Diffraction
  American Chemical Society Fall 2021 *August 2021*

- GURPs: Group-based Undergraduate Research Programs as an Alternative Introduction to Undergraduate Research
  American Chemical Society Fall 2020 *August 2020*
- Thermodynamic Investigation of the Reaction of Metal Halide Salts with Indium Phosphide Quantum Dots and the Role that Inter-ligand Interactions Play
  American Chemical Society Fall 2020 *August 2020*
- Heat Capacity of $Zn(EtIm)_2$ Polymorphs
  Brigham Young University, Student Research Conference *March 2018*
- Heat Capacity and Amorphous Silicon Films
  Brigham Young University, Student Research Conference *March 2017*

AWARDS

- Chemistry Instructional Achievement Award 2021
- Outstanding Graduate Student Instructor Award 2021
- Certificate in Teaching & Learning in Higher Education 2021
- Kavli ENSI Philomathia Graduate Student Fellow 2021–2022
- Certificate in Remote Instruction 2020
- Graduate Remote Instruction Innovation Fellow 2020
- National Science Foundation Graduate Research Fellow 2019–2022
- Graduated BYU Magna Cum Laude
- Outstanding Senior Analytical Chemistry 2018
- Garth L. Lee Undergraduate Teaching Award Winter 2018
- 2nd Place Presenter Student Research Conference 2017
- Winter 2017, Spring/Summer 2017, Fall 2017, Winter 2018 Undergraduate Research Award
- 1st Place Physical and Mathematical Sciences Undergraduate Poster Competition 2016

PROFESSIONAL ACTIVITIES

- Member of Materials Research Society 2022-Present
- Member of Sigma Xi Scientific Research Honor Society 2019-Present
- Member of American Chemical Society 2016-Present
- Member of Phi Eta Sigma National Honor Society 2016-Present