

**Claresta Joe-Wong**  
Lawrence Berkeley National Laboratory  
cjowong@lbl.gov

## EDUCATION

### **Stanford University**

Ph.D. in Geological and Environmental Sciences June 2019

Advisors: Kate Maher and Gordon E. Brown, Jr.

Thesis: Thermodynamic Controls on Redox-Driven Kinetic Stable Isotope Fractionation

### **Princeton University**

A.B. *summa cum laude* in Chemistry June 2014

Certificate in Ancient Roman Language and Culture

Advisor: Satish C. B. Myneni

Thesis: Halogenation of Organic Matter along Climate and Salinity Gradients

## PROFESSIONAL EXPERIENCE

### **Lawrence Berkeley National Laboratory**

National Science Foundation Postdoctoral Fellow 2019-2021

Advisor: Benjamin Gilbert

Project: Light- and Iron-Mediated Oxidation Mechanisms of Organic Matter

## HONORS AND AWARDS

**National Science Foundation Postdoctoral Fellowship** 2019-2021

Awarded to 8-10 fellows nationally per year

**Harriet Benson Fellowship** 2018

Awarded to two graduate students annually in Geological Sciences at Stanford University

**National Defense Science and Engineering Graduate Fellowship** 2014-2017

Provided tuition and a stipend for three years of graduate study

**Anne T. and Robert M. Bass Stanford Graduate Fellowship** 2014-2019

Provided tuition and a stipend for three years of graduate study

**Princeton University Robert Thornton McCay Prize for Physical Chemistry** 2014

Awarded to two seniors in Chemistry

**Princeton University Shapiro Prize for Academic Excellence** 2011-2012

Awarded to fifty juniors for exceptional academic performance during sophomore year

## PUBLICATIONS

**Joe-Wong, C.**; Weaver, K. L.; Brown, S. T.; Maher, K. Thermodynamic Controls on Redox-Driven Kinetic Stable Isotope Fractionation. *Geochem. Persp. Let.* **2019**, *10*, 20–25.

**Joe-Wong, C.**; Schlesinger, D. R.; Chow, A. T.; Myneni, S. C. B. Sea Level Rise Produces Abundant Organobromines in Salt-Affected Coastal Wetlands. *Geochem. Persp. Let.* **2019**, *10*, 31–35.

Nelson, J.; **Joe-Wong, C.**; Maher, K. Cr (VI) Reduction by Fe (II) Sorbed to Silica Surfaces. *Chemosphere* **2019**.

Dustin, M.; Bargar, J. R.; Jew, A. D.; Harrison, A. L.; **Joe-Wong, C.**; Thomas, D. L.; Brown, Jr., G. E.; Maher, K. Shale Kerogen – Hydraulic Fracturing Fluid Interactions and Contaminant Release. *Energy Fuels* **2018**, *32* (9), 8966-8977.

**Joe-Wong, C.**; Brown, G. E.; Maher, K. Kinetics and Products of Chromium(VI) Reduction by Iron(II/III)-Bearing Clay Minerals. *Environ. Sci. Technol.* **2017**, *51* (17), 9817–9825.

Harrison, A. L.; Jew, A. D.; Dustin, M. K.; Thomas, D. L.; **Joe-Wong, C.**; Bargar, J. R.; Johnson, N.; Brown, Jr., G. E.; Maher, K. Element Release and Reaction-Induced Porosity Alteration during Shale-Hydraulic Fracturing Fluid Interactions. *Applied Geochemistry* **2017**, *82*, 47-62.

Jew, A. D.; Dustin, M. K.; Harrison, A. L.; **Joe-Wong, C.**; Thomas, D. L.; Maher, K.; Brown, Jr., G. E.; Bargar, J. R. Impact of Organics and Carbonates on the Oxidation and Precipitation of Iron during Hydraulic Fracturing of Shale. *Energy Fuels* **2017**, *31* (4), 3643-3658.

**Joe-Wong, C.**; Shoenfelt, E. M.; Hauser, E. J.; Crompton, N. M.; Myneni, S. C. B. Estimation of Reactive Thiol Concentrations in Dissolved Organic Matter and Bacterial Cell Membranes in Aquatic Systems. *Environ. Sci. Technol.* **2012**, *46*, 9854–9861.

### SELECTED PRESENTATIONS

**Joe-Wong, C.**; Weaver, K. L.; Brown, S. T.; Maher, K. “Thermodynamic Controls on Kinetic Stable Isotope Fractionation: Chromium(VI) Reduction by Iron(II).” Oral session at Goldschmidt Conference, Boston, Massachusetts, August 2018.

**Joe-Wong, C.**; Weaver, K. L.; Brown, S. T.; Maher, K. “Applications of Marcus Theory to Stable Metal Isotope Fractionation during Redox Reactions.” Oral session at Goldschmidt Conference, Paris, France, August 2017.

**Joe-Wong, C.**; Maher, K.; Brown, Jr. G. E. “Chromium(VI) Reduction by Mixed Fe(II/III)-Bearing Clay Minerals.” Oral and poster session at ACS, Philadelphia, Pennsylvania, August 2016.

### RESEARCH EXPERIENCE

**Light- and Iron-Mediated Oxidation Mechanisms of Organic Matter** 2019-present

- Investigated role of iron in the photochemical production of carbon dioxide from dissolved organic matter
- Characterized mechanism of photolysis of iron-organic complexes using ultrafast infrared spectroscopy

**Redox Kinetics and Thermodynamics of Iron(II)-Bearing Clay Minerals** 2015-2019

- Quantified kinetics of chromium(VI) reduction by iron(II)-bearing clay minerals in anaerobic conditions
- Determined products of chromium(VI) reduction using X-ray absorption spectroscopy
- Experimentally and theoretically characterized chromium isotope fractionation during chromium(VI) reduction

**Redox-Driven Kinetic Stable Isotope Fractionation** 2015-2019

- Characterized chromium isotope fractionation during chromium(VI) reduction by organically ligated aqueous iron(II) species
- Developed thermodynamic framework for redox-driven kinetic stable isotope fractionation

**Fracture and Matrix Geochemistry and Geomechanics** 2014-2015

- Investigated interactions of fracking fluid with iron-bearing minerals (*e.g.*, pyrite)

**Effects of Climate and Sea Level Rise on Halogen Cycling** 2011-2014

- Studied interactions of natural organic matter with bromine and chlorine using ultrahigh resolution mass spectrometry and X-ray absorption spectroscopy
- Awarded \$6000 by the Princeton Environmental Institute, \$4000 by the Princeton University Fred Fox '39 Fund, and \$1500 from the Office of the Dean of the College

**Addition of Ferrihydrite to Stimulate Iron and Uranium Bioreduction** 2013

- Investigated microbial reduction and immobilization of soluble uranium in groundwater upon stimulation by poly(acrylic acid)-coated ferrihydrite

**Estimation of Thiol Concentrations in Aqueous Natural Samples** 2011-2012

- Developed novel method based on fluorescence spectroscopy to estimate thiol concentrations in aqueous natural samples

**LEADERSHIP AND TEACHING EXPERIENCE****Maher Laboratory Manager** 2017-2019

- Trained new personnel
- Developed safety protocols
- Coordinated labwork and supplies for 4 or more students

**Teaching Assistant, GS 170/270: Environmental Geochemistry** Winter 2016-2017

- Guest lectured on chromium in the environment
- Graded problem sets

**Peer Tutor, General and Organic Chemistry** 2012-2014

- Tutored undergraduate students one-on-one who were at risk of failing the course

**SERVICE**

- Reviewer for *Environmental Science and Technology*, *Chemical Geology*, *Analytical and Bioanalytical Chemistry*