

RESUME

Zelong (Eric) Zhang

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<https://er1czz.github.io>

Core Competency

- Characterizations on solution-solid interactions
- Experimental: ICP-MS, IR, solid-state NMR, Raman, SEM/ EDS, XRD, etc.
- Computational: molecular modeling using MD and DFT simulations, Jupyter Notebook, etc.

Education

Louisiana State University, Geology & Geophysics, Baton Rouge, LA Anticipated Dec 2019

- Ph. D. Geochemistry (Earth Materials) Advisor: Dr. Jianwei Wang GPA: 3.9 / 4.0
Dissertation: Investigating geochemical processes of fluid-rock interactions of materials relate to energy and environment

Stony Brook University, Department of Geosciences, Stony Brook, NY May 2014

- M. Sc. Geochemistry (Biomaterial) Advisor: Dr. Brian L. Phillips
Thesis: NMR Investigation of Organic Phosphorus in Calcite, 117 p.

China University of Geosciences, School of Earth Sciences, Wuhan, China Jul 2010

- B. Sc. Geochemistry (Biomarker) Advisor: Dr. Shucheng Xie & Dr. Junhua Huang

Research Experience

Louisiana State University, Geology & Geophysics, Baton Rouge, LA Sep 2014 – Present

Research Assistant:

- 1) Study the degradation of iodine nuclear waste form in geological settings
 - Adopt ASTM standard leach test method to evaluate chemical durability of iodoapatite
 - Perform SEM/EDS, Raman, IR, XRD, ICP-MS, ICP-OES to characterize surface alterations
 - Predict long-term behaviors of iodine nuclear waste based on numerical and theoretical models
- 2) Investigate hydrocarbon interactions with shale media by Molecular Dynamics modeling
 - Calculate the free energy changes of oil desorption from different surfaces by Umbrella Sampling

Lawrence Berkeley National Lab, Deep Learning for Science School, Berkeley, CA Jul 2019

Trainee: Gained hands-on experience using TensorFlow 2.0 on Kera at NERSC HPC

Stony Brook University, Department of Geosciences, Stony Brook, NY Jul 2011 – May 2014

Research Assistant: Developed methodology with NMR to study organophosphates in calcite matrix

- Independently performed solid-state NMR experiments and spectral data analysis
- Applied wet chemistry method to coprecipitate lipid phosphate with calcite CaCO_3

Wuhan Polytechnic University, School of Chemistry, Hubei, China Jan 2009 – Oct 2009

Research Assistant: Developed methodology to test the viscosity of liquid crystal

Awards

[People's Choice Award, Best Writing Award](#), US D.O.E. Video Contest II Jul 2019

The New Orleans Geological Society Memorial Foundation Scholarship May 2019

Laura Cordell & John P "Jay" Moffitt Scholarship Jan 2018

Goldschmidt 2016 Travel Grant May 2016

LSU Graduate School Dean's Travel Awards May 2016

Leadership LSU 2015 Apr 2015

Teaching Experience

Louisiana State University, Geology & Geophysics, Baton Rouge, LA Aug 2017 – Dec 2017

- Student mentor: Supervised research of undergraduate student

Stony Brook University, Department of Geosciences, NY Sep 2010 – Jul 2011

- Teaching Assistant: Assisted in three undergraduate courses

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Patent and Publication

- Zhang, Z., **Zhang, Z.**, Deng, M., Dai, Z., & Zhan, Z. [The Preparation and use of low viscosity liquid crystal materials at low-temperature](#), China Patent 200910273196.0, issued Dec 2009.
- Zhang, Z.**, Liu, H., & Wang, J. (2019). [Free Energy Changes during Fluid-rock Interactions at Oil-shale Interfaces by Molecular Dynamics Simulation](#). *EarthArXiv Preprints* July 31. doi:10.31223/osf.io/sfhqn.
- Zhang, Z.**, Gustin, L., Xie, W., Lian, J., Valsaraj, K. T., & Wang, J. (2019). [Effect of solution chemistry on the iodine release from iodoapatite in aqueous environments](#). *Journal of Nuclear Materials*, 525, 161-170
- Zhang, Z.**, Ebert, W. L., Yao, T., Lian, J., Valsaraj, K. T., & Wang, J. (2019). [Chemical durability and dissolution kinetics of iodoapatite in aqueous solutions](#). *ACS Earth and Space Chemistry*, 3 (3), 452-462
- Zhang, Z.**, Heath, A., Valsaraj, K. T., Ebert, W. L., Yao, T., Lian, J., & Wang, J. (2018). [Mechanism of iodine release from iodoapatite in aqueous solution](#). *RSC advances*, 8(8), 3951-3957.
- Yao, G., **Zhang, Z.**, & Wang, J. (2017). [Beta transmutations in apatites with ferric iron as an electron acceptor—implication for nuclear waste form development](#). *Physical Chemistry Chemical Physics*, 19(37), 25487-25497.
- Phillips, B. L., **Zhang, Z.**, Kubista, L., Frisia, S., & Borsato, A. (2016). [NMR spectroscopic study of organic phosphate esters coprecipitated with calcite](#). *Geochimica et Cosmochimica Acta*, 183, 46-62.
- Zhang, Z.**, Deng, M., Zhang, Z., Wei, B., & Xuan, L. [Study on the synthesis of difluorooxymethylene alkybenzene and the properties of low temperature viscosity](#) *Digest of Technical Paper, ASID' 09*, (2009)190-194.

Professional Communication (Talk, Video, and Poster)

- Life at the Frontiers of Energy Research Video Contest II**, US D.O.E. Jul 2019
- Video: [Nuclear Energy Waste and WastePD](#) (People's Choice, Best Writing Awards)
- Deep Learning for Science School**, Lawrence Berkeley National Lab, Berkeley, CA Jul 2019
- Poster: An integrated approach to study the iodine immobilization in apatite ceramic waste forms - from Artificial Neural Network to First Principle Calculation
- Goldschmidt Conference**, Boston, MA Aug 2018
- Poster: Energetics of the Oil Interaction with Calcite and Kerogen – Implication for Hydrocarbon Transport and Storage in Shale
- D.O.E. EFRC Mid-term Review Meeting**, Gaithersburg, MD Apr 2018
- Poster: Long-term Chemical Duration of Iodine-bearing Apatite in Aqueous Environments
- MRS Spring**, Phoenix, AZ Mar 2018
- Poster: Release Mechanism of Iodine Retained by Apatite Structure Waste Form in Aqueous Environments
- AGU Fall**, New Orleans, LA Dec 2017
- Talk: [Mechanisms of iodine release from iodoapatite in aqueous solution](#)
 - Poster: The interfacial energetics of the oil molecules interactions with shale media using molecular dynamics simulation

Volunteer Experience

- Cat Haven, Baton Rouge, LA May 2019 - Present
- Companion Animal Alliance, Baton Rouge, LA Jul 2018 – May 2019
- Louisiana Children's Museum, 15th Super Saurus Saturday, New Orleans, LA Apr 2015
- Habitat for Humanity, Baton Rouge, LA Mar 2015
- Super Science Saturday, LSU, Baton Rouge, LA Oct 2014