Two Postdoc positions in molecular complexation of rare earth elements (REE) in high temperature and pressure supercritical geologic fluids

We seek motivated candidates with a strong interest in high-temperature hydrothermal experimental geochemistry, EXAFS and Raman/UV-Vis spectroscopy, chemical thermodynamics and computational geochemistry. These positions are part of the new collaborative U.S. geoscience critical minerals experimental – thermodynamic research hub between New Mexico Tech (NMT), Los Alamos National Laboratory (LANL), and Indiana University Bloomington (IUB), which is a Department of Energy (DOE), Basic Energy Sciences, funded project (https://www.energy.gov/articles/doe-announces-30-million-research-secure-domestic-supply-chain-critical-elements-and). The two Postdoc positions are expected to be filled as soon as possible starting November 2021.

1) Postdoctoral Fellow in Experimental Geochemistry, New Mexico Tech

**JOB DUTIES:** The Postdoctoral Fellow will conduct hydrothermal laboratory experiments using X-ray absorption spectroscopic (XAS) techniques combined with hydrothermal diamond anvil cells (HDAC) and Raman/UV-Vis flow-through experiments to determine the speciation of REE in high temperature supercritical fluids. The Postdoctoral Fellow will design and test new laboratory experiments, conduct spectroscopic analyses, train students in the laboratory experiments and conduct data interpretation, analyze experimental solutions using ICP-MS, ICP-OES and minerals using XRD and SEM. This work will be complemented with molecular dynamic simulations and the development of thermodynamic and experimental databases. The Postdoctoral Fellow will also be writing research publications for peer-reviewed journals and present at conferences. This position is hosted at New Mexico Tech with Alexander Gysi as supervisor, but includes collaborations with our partners in the new U.S. geoscience critical minerals experimental – thermodynamic research hub between New Mexico Tech (NMT), Los Alamos National Laboratory (LANL), and Indiana University Bloomington (IUB). As such, the Postdoctoral Fellow will be expected to travel yearly with up to 5 months internships at LANL and apply for beamline time and travel to the GSECARS facility in Chicago for XAS-HDAC experiments.

**REQUIRED/DESIRED QUALIFICATIONS:** Ph.D. or other doctorate level equivalent. Required areas of study include Geochemistry/Chemistry/Geosciences. X-ray absorption (XAS) spectroscopy and hydrothermal diamond anvil cell (HDAC) required. UV-Vis and/or Raman spectroscopy required. Analytical chemistry (ICP-OES, ICP-MS) and mineralogy (XRD, SEM)
desired. Molecular simulations and thermodynamic modeling desired. Coding of python and/or C++ desired.

**APPLICATION:** For additional questions about this project please email alexander.gysi@nmt.edu. Applications will be reviewed starting immediately until positions are filled. Starting salary is 50k/yr, and employment renewable each year contingent on satisfactory progress for up to 34 months.

Applicants are expected to submit a CV, academic transcripts, a cover letter and obtain three reference letters. Please apply here

- **2) Postdoctoral Fellow in Computational Geochemistry, New Mexico Tech**

**JOB DUTIES:** The Postdoctoral Fellow will conduct ab initio molecular dynamic (MD) simulations to determine the speciation of REE in high temperature supercritical fluids. This work includes the use of high performance computing facilities at LANL in close collaboration with Dr. Dub. This Postdoctoral Fellowship has the option to include hydrothermal laboratory experimental work using X-ray absorption spectroscopic (XAS) techniques combined with hydrothermal diamond anvil cells (HDAC), and apply for beamline time and travel to the GSECARS facility in Chicago for XAS-HDAC experiments. The Postdoctoral Fellow will also be writing research publications for peer-reviewed journals and present at conferences. This position is hosted at New Mexico Tech with Alexander Gysi as supervisor, but includes collaborations with our partners in the new U.S. geoscience critical minerals experimental – thermodynamic research hub between New Mexico Tech (NMT), Los Alamos National Laboratory (LANL), and Indiana University Bloomington (IUB). As such, the Postdoctoral Fellow will be expected to travel yearly with up to 5 months internships at LANL.

**REQUIRED/DESIRED QUALIFICATIONS:** Ph.D. or other doctorate level equivalent. Required areas of study include Geochemistry/Chemistry/Geosciences/Computer science. Molecular simulations and thermodynamic modeling required. Coding of python and/or C++ required. X-ray absorption (XAS) spectroscopy and hydrothermal diamond anvil cell (HDAC), UV-Vis and/or Raman spectroscopy desired.

**APPLICATION:** For additional questions about this project please email alexander.gysi@nmt.edu. Applications will be reviewed starting immediately until positions are filled. Starting salary is 50k/yr, and employment renewable each year contingent on satisfactory progress for up to 34 months.

Applicants are expected to submit a CV, academic transcripts, a cover letter and obtain three reference letters. Please apply here