Edward L. Vinis

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Professional Summary

Multidisciplinary Geochemist and Geologist with an M.S. in Environmental Studies and over 5 years of experience spanning analytical chemistry, high-pressure/temperature geochemical research, and environmental laboratory analysis. Expert in hands-on work in and out of the laboratory, with a proven track record of publishing high-impact research in *Nature Communications* and *Scientific Reports*. Committed to leveraging geochemical expertise to solve complex environmental challenges, from decarbonization strategies to sustainable resource management.

Core Competencies

- **Geochemical Analysis:** High-temperature/pressure flow-through experiments (>380°C, 25 MPa), supercritical fluid behavior, and silica-sealing zone dynamics.
- **Analytical Instrumentation:** X-Ray CT, ICP-AES, SEM-EDS, EPMA, Raman Spectroscopy, μ-XRF, NMR, and Mass Spectrometry.
- **Environmental Lab Techniques:** Wet chemistry, leachate extraction (TCLP), organic synthesis, and titration.
- **Software & Data:** Python (Matplotlib, Numpy), ArcGIS/QGIS, LIMS, and Dragonfly CT modeling.
- **Project Leadership:** Managing multi-disciplinary teams, international conference presentations, and government-funded research.

Education

- **M.S. in Environmental Studies** | Tohoku University, Japan | Sept. 2024
  - Recipient of the Japanese Government (MEXT) Scholarship.
- **B.S. in Geology** | University of Oregon, USA | Sept. 2021
  - Earth Science GPA: 3.94; Commencement Speaker.
- **B.S. in Chemistry** | University of Puget Sound, USA | May 2014

Research & Geothermal Experience

Graduate Student Researcher | Tohoku University, Japan | Sept. 2022 – Sept. 2024

- **Geothermal Focus:** Performed geochemical experiments on silica precipitation to understand its role in geothermal energy potential and seismic activity.

- **Experimental Design:** Constructed and operated high-pressure flow-through apparatus using stainless-steel Swagelok equipment and titanium autoclaves.
- **Advanced Characterization:** Utilized X-ray CT and SEM-CL to analyze fluid pressure oscillations caused by fracture sealing in granite.
- **Impact:** Published findings on silica behavior in crustal environments in *Nature Communications* and presented at six international conferences.

Undergraduate Research Assistant | University of Oregon | Nov. 2020 – Aug. 2021

- Investigated $CaCO_3$ precipitation related to the direct air capture of CO_2.
- Conducted multi-day reactions using auto-titrators and Environmental SEM (ESEM) to study isotopic fractionations.

Undergraduate Researcher | University of Puget Sound | May 2013 - May 2014

- Performed organic synthesis experiments to investigate more efficient liquid crystal molecules to be used in potential LCD applications.

Environmental & Professional Experience

Organic Prep Analyst I | TestAmerica (Eurofins), USA | Mar. 2016 – June 2017

- Extracted and concentrated environmental samples for organic contaminant analysis following strict SOPs and EPA methods.
- Performed TCLP leachate extraction to simulate long-term environmental leaching of contaminants.
- Managed data reporting and sample tracking within LIMS software.

Project Administrator | Kimball Construction, USA | Jan. 2019 – Aug. 2022

- Managed logistics and business development for residential and commercial remodeling projects.
- Collaborated with trade contractors and carpenters, gaining practical knowledge of trades and building construction.

Publications

- **Nature Communications (2025):** *"Oscillations in fluid pressure caused by silica precipitation in a fracture"*. https://doi.org/10.1038/s41467-025-57199-6
- **Scientific Reports (2025):** *"Flow boiling-driven intensive growth of critical minerals during short-lived events"*. https://doi.org/10.1038/s41598-025-32193-6
- **Ore Geology Reviews (2024):** *"Fluid overprints and mineralization of the Zhuguangshan granite-related U district in China"*. https://doi.org/10.1016/j.oregeorev.2024.106256

Field Skills

- Geologic mapping of stratigraphic units, paleo channels in Oregon and Montana.
- Assisted graduate students in sample collection and geologic mapping across Oregon and Washington utilizing GIS software.