

One-hour Directed Study, Fall 2019

GEOL 4166 — CRN 19512

Instructor: Dr. Benjamin Brunner

August 30, 2019

COURSE DESCRIPTION

Development of a method for the precipitation of silver phosphate for subsequent oxygen isotope analysis of phosphate

Aim: scientific method development/research

Oxygen isotope analysis of phosphate is done by conversion of phosphate into silver phosphate, which then can be analyzed for its oxygen isotope composition. The currently employed process to produce silver phosphate is a tedious and error-prone precipitation process that involves silver nitrate. For oxygen isotope analysis of sulfate, a different process is known, which does not suffer from the same shortcomings. We would like to test if we can adapt the protocol for silver sulfate precipitation to work for phosphate.

The directed study would pilot this research and development project and involve laboratory work and literature research.

COURSE OBJECTIVES

- 1) Development of skills in design and execution of a research project
- 2) Gaining hands-on experience in electrochemistry approaches
- 3) Ability to take accurate and complete laboratory notes
- 4) Writing of a short and concise project report, with suggested action items for project continuation.
- 5) Learning the use of citation software

MEETING TIMES: TBD – in blocks

NO TEXTBOOK REQUIRED; Prerequisite: Laboratory Safety Training

Papers from the scientific literature will be provided by instructor, e.g.

Savarino, J., Alexander, B., Darmohusodo, V., and Thiemens, M.H., 2001, Sulfur and Oxygen Isotope Analysis of Sulfate at Micromole Levels Using a Pyrolysis Technique in a Continuous Flow System: *Analytical Chemistry*, v. 73, p. 4457–4462, doi:10.1021/ac010017f.

GRADE

20% Mid-term report

30% Lab notes

50% Final report

Accommodations are possible for active duty military and others, but arrangements must be made in a timely manner. If you are in the military with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact the instructor as soon as possible.

If you think you may have a *disability or if you are experiencing learning difficulties*, please contact the Center for Accommodations and Support Services (CASS), East Union Bldg, Room 106:

Office: 915-747-5148 / Email: cass@utep.edu / <https://www.utep.edu/student-affairs/cass/>