

Facilities, Equipment and Other Resources —Yale University Isotope Geochemistry and Geochronology Center

Lab Description

The Isotope Geochemistry and Geochronology Center at Yale University is a world-class facility for the analysis of sedimentary rocks and sulfides using the rhenium-osmium (Re-Os) isotope system. The facility is housed in 1000+ ft² of clean lab space which includes two separate, metal-free Picotrace class 100 clean rooms. These spaces were specifically designed for low-blank dissolution, ion chromatographic separation and climate-controlled mass spectrometry. The center houses two Thermo-Fisher multi-collectors; a Neptune-Plus and a Triton-Plus, as well as two quadrupole ICP-MS; an Element XR and a TQ-iCAP.

Isotope dilution analytical procedures are in place for Re-Os geochronology, as well as osmium isotope stratigraphy. The department maintains a standard sample preparation facility, which contains saws, a SPEX Shatterbox with multiple dishes, powdering mills and equipment for petrographic thin section preparation.

Timeframe

Visiting students can successfully generate data in approximately 7-14 days. This requires samples to be shipped to Yale prior to the student's arrival for cutting, polishing and powdering, so that Re tests can be performed in order to assess elemental concentrations. Samples must be sent no less than 4 weeks before the scheduled visit. We recommend contacting the lab PI 2-3 months in advance of a prospective visit. Batches of 6-8 samples (one isochron) are put through full carius tube chemistry and TIMS work per week.

Preparation for visit

Samples shipped ahead of time will be prepared (cutting, powdering and Re testing) for complete Re-Os chemistry and analysis during the student's visit. During the student's visit she/he can cut and prep additional samples for Re tests in order to gain a complete overview of the Re-Os procedure.

Data Processing and Interpretation

During their visit to the lab, students will learn how to process and reduce data along every step of procedure. This includes correction of raw data for oxide fractionation, reduction of spiked sample data, generation of a Re-Os age or Os isotope profile and uncertainty and error propagation using data regression software. Professor Alan Rooney (PI) will be available for post-visit consults with students through email and/or videoconferencing until they are satisfied with their understanding of the results.

Analytical costs

Sample preparation (cutting Full analysis of 6-10 samples for an isochron age is \$2000. This cost includes all analytical procedures, sample preparation and data processing.

Laboratory Availability

The Yale facilities are generally available with an expected lead time of no less than 2 months.

Contact information

Please contact lab PI Professor Alan Rooney: alan.rooney@yale.edu (Tel. 203-432-3761) for more information, or with any questions.