Introduction to Isotope Geochemistry  
SIO 144/252A  
Winter 2016

Location: Vaughan Hall, Rm. No. 100
Time: Tuesday-Thursday: 12:30 - 1:50 p.m.
Instructors: Pat Castillo (3131 Sverdrup Hall, pcastillo@ucsd.edu)
Jeff Severinghaus (211 Vaughan Hall, jseveringhaus@ucsd.edu)

References*: (on reserve in Rm 10, Old Scripps Building):
Also, see notes of individual instructors

Grading (Letter grade):
30%  Homework
30%  Midterm
40%  Final Exam

Tentative class schedule:
5 Jan  PC  Intro to isotope geology, nucleosynthesis, radioactive decay and growth
7 Jan  PC  Trace element geochemistry, mass spectrometry
12 Jan PC  Radiogenic isotope geochemistry, Rb-Sr isotope systematics
14 Jan PC  Sm-Nd isotope systematics
19 Jan PC  Two-component mixtures
21 Jan PC  K-Ar and $^{40}$Ar/$^{39}$Ar methods of dating, extinct radionuclides
26 Jan PC  Lu-Hf & Re-Os isotope systematics
28 Jan PC  Pb isotope systematics
2 Feb  PC  The Sr-Nd-Pb-He isotopic signature of oceanic rocks
4 Feb  PC  Pb paradoxes and mantle geodynamics
9 Feb  JS  Mid-term
11 Feb JS  Noble gases as tracers in the solid earth, ocean, and atmosphere
16 Feb JS  Cosmogenic isotopes I – Surface exposure dating, $^{10}$Be and $^{36}$Cl
18 Feb JS  Cosmogenic isotopes II – Carbon-14 as tracer and clock
23 Feb JS  Principles of isotope fractionation and water isotopes
25 Feb JS  Oxygen isotopic composition of carbonate shells/paleothermometry
1 March JS  Carbon isotopes; photosynthetic fractionation; major reservoirs
3 March JS  Carbon isotopes; applications
8 March JS  Nitrogen Isotopes
10 March JS  Sulfur Isotopes
**Final exam:** Tuesday, 11:30 a.m. – 2:29 p.m., 15 March

* References:
QE501.4.N9 F38 2005

Allègre, Claude J., Isotope geology Cambridge University Press, 2008
QE501.4.N9 A45 2008

Dickin, Alan P., Radiogenic isotope geology, Cambridge University Press, 2005
QE501.4.N9 D53 2005


Robert Bowen, Isotopes in the earth sciences
QE501.4.N9 B69 1988