

GEO 215 Minerals & Rocks
Review for Igneous-Sedimentary Rock Test

Rock-forming Minerals

1. Know the formulas of all common rock-forming minerals, including:
 - olivine (and, forsterite and fayalite)
 - Plagioclase (and, anorthite and albite)
 - K-spar (microcline, orthoclase, sanidine)
 - Quartz

Pyroxene quadrilateral endmembers: Diopside, Hedenbergite, Enstatite, Ferrossillite, Wollastonite
2. Know the compositions (even if you don't know the precise formulas) of: muscovite, biotite, augite, clay minerals (general composition)
3. Know general temperature of formation information involving feldspars and ferromagnesian minerals (high versus low, etc.)

Igneous

1. Be able to give a name to a rock, given its modal analysis or norm. Understand how calcalkaline rocks are classified, and how we distinguish between alkalic and subalkalic rocks/magmas.
2. Understand igneous differentiation; specifically how various magmas would be expected to change during fractionation of minerals from liquid. Know concepts such as "eutectic", liquidus, etc. that apply to phase diagrams.
3. Understand partial melting processes to produce various types of igneous rock. What role does pressure, temperature, the "eutectic effect", etc. have on melting? What parent materials in the Earth produce various magmas, basaltic, andesitic, granitic, etc.
4. Where on and in the Earth would various igneous rocks be expected to occur? Ex: What kind of lava (specifically) is produced at mid-oceanic ridges?
5. Know about and be able to identify various igneous bodies, volcanoes, batholiths, dikes, sills, etc. Where in the world or the USA would you go to find these features – and why do they occur where they do?
6. What kinds of minerals and texture would you expect to see in a pegmatite? in a kimberlite diatreme? in milky quartz veins of the Sierra Nevada?

Sedimentary

1. Be able to identify a sandstone or other sedimentary rock given a description of its composition, texture, etc.
2. Be able to assess maturity in sandstones and other clastic rocks.
3. Understand the concept of “provincance” and be able to determine the provincance of a sedimentary rock given its composition. How do “heavy mineral suites” help in that determination?
4. Understand the concept of “diagenesis” and be able to describe aspects of it.
5. Understand weathering processes: which minerals are most susceptible to chemical weathering, and to what do they weather? What is Goldich’s Weathering Series?
6. Be able to identify various tectonic or depositional environments given the kinds of sedimentary rocks found there. Ex: outward from a beach => sandstone, shale, limestone, would be a neritic (shelf) environment. Ex: Dune fields, alluvial fans, bajadas, and playa lakes are things found in the basin-range province (continental rift environment)
7. What is an argillite, arenite, rudite? a marl, dolostone, arkose, evaporite, siltstone? How would you define a sandstone using the Wentworth scale?
8. Know a bit about the local (Dunkirk-Fredonia) sedimentary geology: Local bedrock formation names, period of deposition (Devonian), most common rock types?

READING: Read all assigned chapters

Check out these things in particular:

Page 24; Fig. 15

Page 25; Fig. 16

Page 54; Fig. 41

Page 55; Fig. 42 (also Figs. 43, 44)

ALL Chapters 5, 7 ... and any other material discussed in class

TEST FORMAT

An eclectic blend of fill-in-blanks, short answer, definitions, true-false, matching, multiple choice