

Contents

GEO-101L (CSUF) Exam 1 Study Guide	1
Glossary	1
Minerals	2
Orthoclase Feldspar	2
Plagioclase Feldspar	3
Quartz	4
Chert	5
Olivine	5
Halite	6
Calcite	6
Gypsum	7
Talc	7
Muscovite	8
Augite pyroxene	8
Hornblende amphibole	9
Biotite	10
Pyrite	11
Galena	12
Metamorphic Rock Identification	13
Gneiss	13
Schist	13
Slate	14
Quartz	14
Phyllite	15
Marble	15
General Questions	16
External Links	18

GEO-101L (CSUF) Exam 1 Study Guide

Glossary

- Conchoidal : denoting a type of fracture in a solid (such as flint or quartz) that results in a smooth rounded surface resembling the shape of a scallop shell.
- rhombohedral: angled rhombus in \mathbb{R}^3
- basal: forming or belonging to a bottom layer or base.

Minerals

Orthoclase Feldspar

- Colors: white, reddish, pink, yellow
- Luster: glassy
- Hardness: 6
- Streak: white
- Cleavage: $2 \sim 90$ degrees



Figure 1: Orthoclase Feldspar

Plagioclase Feldspar

- Colors: dark grey to almost black
- Hardness: 6 - 6.5
- Streak: white
- Cleavage: 2
- Luster: glassy and pearly on some cleavage faces



Figure 2: Plagioclase Feldspar

Quartz

- Colors: colorless
- Luster: glassy
- Hardness: 7
- Streak: none/white (it is harder than the porcelain)
- Cleavage: poor/indistinct



Figure 3: Quartz

Chert

- Colors: white → black || cream → brown
- Luster: waxy
- Hardness: 6.5 - 7
- Streak: white or lightly colored
- Cleavage: do me daddy



Figure 4: Chert

Olivine

- Colors: olive green
- Luster: glassy
- Hardness: 6.5 - 7.0
- Streak: colorless
- Cleavage: poor cleavage, brittle



Figure 5: Olivine

Halite

- Colors: colorless or white
- Luster: glassy
- Hardness: 2.5
- Streak: white
- Cleavage: Perfect, cubic, three directions at right angles



© geology.com

Figure 6: Halite

Calcite

- Colors: white
- Luster: glassy
- Hardness: 3
- Streak: white
- Cleavage: Perfect, rhombohedral, three directions



© geology.com

Figure 7: Calcite

Gypsum

- Colors: clear, colorless, white, grey (dull colors)
- Luster: silky
- Hardness: 2
- Streak: white
- Cleavage: perfect



© geology.com

Figure 8: Gypsum

Talc

- Colors: green, white, gray, brown
- Luster: Pearly
- Hardness: 1
- Streak: white to pale green
- Cleavage: perfect



© geology.com

Figure 9: Talc

Muscovite

- Colors: when clustered → black, brown, grey. When split → colorless, dull tints of brown
- Luster: Pearly to glassy
- Hardness: 2.5 - 3
- Streak: white (leaves behind tiny flakes)
- Cleavage: perfect



Figure 10: Muscovite

Augite pyroxene

- Colors: dark green, black, brown
- Luster: glassy on cleaved sides but dull otherwise
- Hardness: 5.5 - 6
- Streak: white to grey to very pale green
- Cleavage: prismatic in two directions that intersect at slightly less than 90 degrees



Figure 11: Augite Pyroxene

Hornblende amphibole

- Colors: black, dark green and dark brown
- Luster: glassy
- Hardness: 5 to 6
- Streak: white, colorless
- Cleavage: two directions intersecting at 124 and 56 degrees



Figure 12: Hornblende amphibole

Biotite

- Colors: black, dark green/brown
- Luster: glassy
- Hardness: 2.5 to 3
- Streak: white to grey
- Cleavage: basal, perfect



© geology.com

Figure 13: Biotite

Pyrite

- Colors: brass yellow,
- Luster: metallic
- Hardness: 6 - 6.5
- Streak: greenish black → brownish black
- Cleavage: breaks with conchodial fracture



Figure 14: Pyrite

Galena

- Colors: fresh surfaces are bright silver with bright metallic luster, tarnished samples have a dull grey appearance
- Luster: ↑
- Hardness: 2.5+
- Streak: lead grey to black
- Cleavage: perfect, cubic, three directions at right angles



Figure 15: Galena

Metamorphic Rock Identification

Gneiss

- Parent Rock: Shale
- Texture: Foliated
- Major Minerals: Quartz and Feldspar



Figure 16: Gneiss

Schist

- Parent Rock: Shale
- Texture: Foliated
- Major Minerals: Muscovite and biotite



Figure 17: Schist

Slate

- Parent Rock: Shale
- Texture: Foliated
- Major Minerals: not visible to naked eye



Figure 18: Slate

Quartz

- Parent Rock: Sandstone
- Texture: Non-foliated
- Major Minerals: Quartzite



Figure 19: Quartz

Phyllite

- Parent Rock: Shale
- Texture: Foliated
- Major Minerals: not visible to the naked eye



Figure 20: Phyllite

Marble

- Parent Rock: Limestone
- Texture: Non-foliated
- Major Minerals: Calcite



Figure 21: Marble

General Questions

1. What is the definition of a mineral? Provide an example:

Naturally occurring, inorganic, solids, distinct chemical composition, crystalline structure. Ice is an example.

2. Define:

Luster: how it shines

Cleavage: Planes in which the rock/mineral break

Fracture: yeah I don't know

Hardness: how strong are the chemical bonds in the mineral.

Streak: the color it leaves when scraped on porcelain.

3. What mineral effervesces when HCl (Hydrochloric Acid) is dropped on it?:

Calcite

4. Igneous Rocks

Define: Rocks that have completely melted

Aphanitic texture: cannot see individual minerals

Phaneritic texture: Coarse grained texture

Porphyritic texture: Fine-grained texture

What 3 criteria are used to identify igneous rocks?

Texture

Composition

Mineralogy

5. What is a divergent plate boundary and how does it relate to igneous rock?

Two plates move apart and lava comes up from the cracks that form.

6. What is a convergent plate boundary and how does it relate to igneous rocks?

Two plates going head on with one another and if one is lighter than the other it can get trapped underneath the dominant plate. This subduction results in the melting of the submissive plate, creating new igneous rock.

7. Intrusive:

Cooled inside the Earth

8. Extrusive:

Cooled on Earth's surface

9. Sedimentary Rocks

How are sedimentary rocks formed: Rocks and sediments layered ontop of each other.

Three types of sedimentary rocks:

Clastic

Chemical

Biogenic

How are clastic sedimentary rocks commonly classified?: Their grain size, mineralogy, grain/mineral shape and sorting.

What are the three clast particle size and classifications: Gravel, sand, mud.

How would you tell the difference between chalk and diatomite?: Diatomite is made of diatoms which have a Silica skeleton. Chalk is made of coccolithophores which have a calcite skeletons. Since we know that calcite will react with HCl, we can test by checking for fizz on both samples.

10. Metamorphic Rocks

How do metamorphic rocks form?: High heat and/or pressure. Any combination of the two.

The type of metamorphic rock that forms is dependent on which three factors?: Parent rock, temperature, and pressure.

Define regional metamorphism ↑ pressure, ↓ temperature

Defined contact metamorphism: Hot magma burns but does not completely melt surrounding rock.

Define foliated texture: Banded appearance

Shale is the parent rock of which four metamorphic rocks?: Slate, schist, gneiss, phyllite

What is the parent rock of quartzite?: Sandstone

What is the parent rock of marble?: Limestone

External Links

- Mineral Categorization
- Mineral Catalog