Igneous Petrology (WWU) Cheat Sheet

by Rachel (Aliemah) via cheatography.com/76959/cs/18909/

Common Igneous Minerals (Thin Section)

Amphibole (Hornblende)	Irregular fractures, pale yellow pleochroism, 1st order yellow to 2nd order pink birefringence
Biotite	Light brown to yellow pleochroism, 2nd order yellow birefringence
Clinopyroxene (Augite)	Weakly pleochroic, pale green or brown pleochroism, 2nd order green to yellow birefringence, inclined extinction
Olivine	High relief, high birefringence, conchoidal fracture
Orthoclase (K-Feldspar)	No pleochroism/translucent in plane light, 1st order gray to yellow birefringence, can display twinning
Orthopyroxene (Enstatite)	Pink to green pleochroism, 1st order gray to purple birefringence, parallel extinction
Plagioclase	No pleochroism, 1st order gray to yellow birefringence, twinning common and simple
Quartz	Translucent in plane light, 1st order gray to yellow birefringence, conchoidal fracture

Common Igneous Minerals (Hand sample)

Amphibole (Hornblende)	Black to brown, vitreous, elongate columnar, cleavage at 60 and 120
Biotite	Black to brown, vitreous, flaky sheets,
Clinopyroxene (Augite)	Green to black or pale green, stubby columnar, vitreous, stair-step cleavage
Olivine	Green, vitreous, granular texture, conchoidal fracture
Orthoclase (K-Feldspar)	Pink or white, tabular, vitreous, lamellae
Orthopyroxene	Brown, shreddy texture, elongate columnar, resinous
Plagioclase	White, vitreous, massive
Quartz	White to gray or translucent, vitreous, massive granular texture, conchoidal fracture

QAPF Minerals

Alkali-feldspars	**Feldspathoids**
K-Feldspar	Nepheline
Albite	Leucite

Rock Textures & Structures

Phaneritic	Grains are visible without assistance
Aphanetic	Grains seen with a microscope, but not glassy
Porphyritic	Large crystals surrounded by smaller ones
Phenocryst	A large crystal in comparison to others
Microcrystalline	A hand lens is needed to discern grains
Groundmass/Matrix	Surrounding crystals of similar size
Cryptocrystalline	Grains unable to be seen with a microscope, but not glassy
Holocrystalline	Entirely made of formed crystals
Hypocrystalline	Some crystals and some glass
Holohyaline	Entirely glass
Cumulus	Euhedral (perfect) crystals surrounded by other material
Intercumulus	Subhedral to anhedral crystals grown secondary to the crystals enclosed in its matrix
Vesicular	Rounded, hollow cavities in the rock (caused by gas bubbles typically)
Pandiomorphic granular	Most crystals formed have similar size and are euhedral in perfection
Hypidiomorphic granular	Most crystals formed have similar size and are subhedral or anhedreal in perfection
Poikilitic	Phenocrysts surround other crystals entirely
Rapakivi	A corona effect of specifically plagioclase surrounding K-spar
Pyroclastic	Fragments of crystals formed together
Tuffaceous	Mostly ash instead of crystals
Trachytic	Crystals are aligned parallel or sub-parallel to one another

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Rock Textures & Structures (cont)

Welded	Any vesicles in the rock have been deformed to look cigar-shaped
Amygdule	Cavities/vesicles in a rock that have been filled with minerals
Scoria-ceous	A highly vesicular rock, typically sharp where vesicles meet
Pumaceous	A highly vesicular rock with a lighter color
Devitrifi-cation	The process of delayed crystallization of a glass
Flow banding	Wavy layers in a glassy rock; gives evidence of variable devitrification

How to Write Rock Descriptions

1. Rock name + color

2. Textures in the rock

- Degree of crystallinity
- Grain size

3. Mineral modes present

4. Mineral descriptions

- Groundmass
- Vesicles
- Crystal perfection
- Noteable mineral textures

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