

### 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)                |
| Pandimorphic granular   | Most crystals formed have similar size and are euhedral in perfection                 |
| Hypidiomorphic granular | Most crystals formed have similar size and are subhedral or anhedral 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                          |



### 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          |
| Scoriaceous     | A highly vesicular rock, typically sharp where vesicles meet             |
| Pumaceous       | A highly vesicular rock with a lighter color                             |
| Devitrification | The process of delayed crystallization of a glass on                     |
| 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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