LAB 3-0: Mineral Properties

LaChappelle’s Handy Dandy reference.

What is a mineral? A mineral is an earth material with the following characteristics:

1. naturally occurring
2. inorganic
3. solid
4. an orderly internal structure
5. specific chemical composition

Minerals can be identified by observing certain features:

1. Crystal Habit
2. Hardness
3. Streak
4. Luster
5. Magnetism
6. Cleavage
7. Color
8. Chemical Reaction
9. Fracture
10. Specific Gravity
11. Striations
12. Double refraction
Crystal Habits (Crystal Shapes)
Is the geometric shape of a mineral, the general outward appearance. There are many habits. In this lab, we will encounter only a few. Here are some of them:

- dodecahedron
- cube
- hexagonal prism
- Octahedron (dipyramid)
- pyritohedron
- rhombohedron
Other crystal habits: (numbers refer to examples in “Simon and Schuster’s Guide to Rocks and Minerals”)

- **acicular**: slender, needlelike crystals (28)
- **columnar**: stout, column like individuals (244)
- **capillary**: hairlike (266)
- **fibrous**: slender fibers either radiating or parallel (28)
- **bladed**: elongated crystals, flattened like a knife blade (122)
- **dendritic**: slender divergent branches (28)
- **botryoidal**: globular forms that resemble a bunch of grapes (88, 91)
- **reticulated**: lattice like groups (84)
- **radiated**: radiating outward (28)
- **foliated**: easily separated into plates or leaves
- **micaceous**: splits into very thin sheets (230)
- **drusy**: surface covered with small crystals (162)
- **tabular**: flat, plate like individuals (122)

**Mohs Hardness Scale:**
The resistance of a mineral to scratching.

1: TALC
2: GYPSUM
3: CALCITE
4: FLUORITE
5: APATITE
6: ORTHOCLASE
7: QUARTZ
8: TOPAZ
9: CORUNDUM
10: DIAMOND
Common objects to measure hardness...

Streak:
The color of a finely powdered mineral after it has been rubbed against a ceramic plate. This procedure allows for a mineral to be finely pulverized so that the color of a mineral can be more accurately observed. This is useful when studying minerals with a vitreous or metallic luster.

Luster:
The reflection of light from the surface of a mineral.

- **vitreous**: luster of glass
- **metallic**: shininess that of metal
- **submetallic**: less shiny than metal
- **earthy**: like dirt
- **silky**: silk like...reflection from very finely fibrous minerals...
- **dull**: no shine
- **waxy**: like wax
- **greasy**: like a thin film of oil
- **pearly**: an iridescent pearl-like luster
**Magnetism:**
Minerals that are attracted to a magnet such as magnetite and to some degree hematite.

**Cleavage:**
The breaking of a mineral along its crystallographic planes, revealing crystal structure.

**Color:**
The color of a mineral due to its atomic make up.

**Chemical reactivity:**
The ability to react with acid. Calcite is a good example of this.
Fracture:
Breakage that does not occur along cleavage planes.

- conchoidal: the smooth surface, curved fracture resembling the interior surface of a shell

- fibrous or splintery: fibrous
- hackly: jagged fractures with sharp edges such as wood
- irregular: fractures producing rough or irregular surfaces

Specific Gravity:
Density: the amount of mass per volume.

Striations:
Straight hairline grooves on the cleavage faces of some minerals due to the growth of the mineral and the alignment of atoms.

Double Refraction:
The ability of crystals to split a beam of ordinary light into two beams.

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