

Minerals Topic 3



Minerals are naturally-occurring substances that combine to make up rocks. Rocks, therefore, are mixtures of one or several minerals cemented together in various ways.

Mineral characteristics:

- ❖ Naturally-occurring solids
- ❖ Inorganic
- ❖ Solidify into crystals when melted
- ❖ Have a definite chemical composition

Minerals are identified using several properties: color, streak, luster, hardness, cleavage or fracture, crystal form, chemical composition, specific gravity.

COLOR

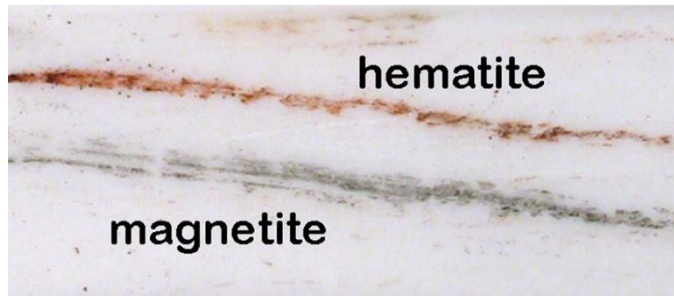
A specific mineral may come in more than one color. For example, quartz comes in many different colors; it can be rose-colored, yellow, purple, white or clear. Thus, color alone cannot identify a mineral. Mineral identification must be supported using other characteristics as well.



QUARTZ COMES IN MANY DIFFERENT COLORS

STREAK

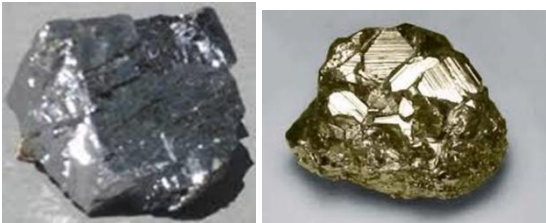
Streak is the powdery residue left behind when a mineral is scraped over a rough surface. A mineral's streak may not match its color. For example, pyrite (Fool's Gold) looks like gold, but its streak is black.



Streaks of two different minerals

LUSTER

Luster is the way the surface of a mineral reflects light. Minerals can have either a metallic or non-metallic luster. Non-metallic minerals can look glassy, pearly, earthy or dull.



Metallic luster



Non-metallic luster

HARDNESS

The Mohs hardness scale ranks ten specific minerals on a scale from 1 to 10, where 1 is the softest mineral on the scale and 10 is the hardest.

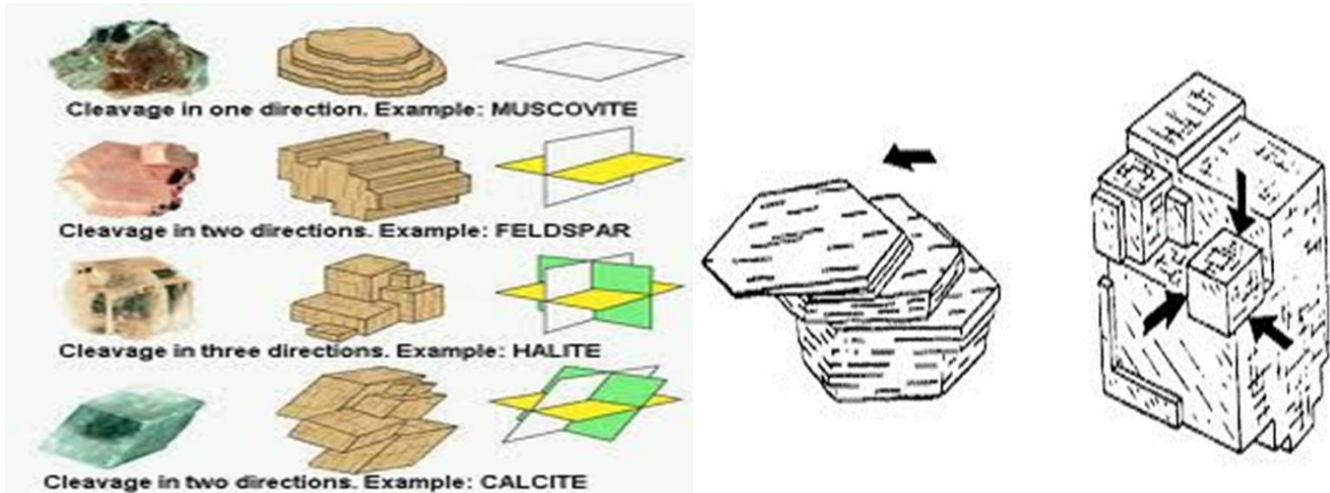
Mohs Hardness Scale →

1	TALC		6	FELDSPAR	
2	GYPSUM		7	QUARTZ	
3	CALCITE		8	TOPAZ	
4	FLOURITE		9	CORUNDUM	
5	APATITE		10	DIAMOND	

CLEAVAGE AND FRACTURE

Cleavage is a mineral's ability to split easily along flat planes. Minerals may split along one, two, three or four planes of weakness. Mica has one cleavage plane; halite has three. **Fracture** is when a mineral breaks unevenly in an irregular way.

Cleavage



Fracture



CRYSTAL FORM

When a mineral melts, it forms crystals with a specific shape as it solidifies.

cubic	tetragonal	hexagonal	orthorhombic	monoclinic	triclinic
examples: halite galena	examples: zircon chalcopyrite	examples: quartz calcite	examples: sulfur staurolite	examples: mica gypsum	examples: feldspar rhodonite



CHEMICAL COMPOSITION

There are 8 elements that combine to form minerals. **Oxygen, the most abundant element found in Earth's crust, is also the most common element found in minerals.** Silica is the second most common element. Copper is an example of a mineral made from one element.

SPECIFIC GRAVITY

Specific gravity is found by comparing a mineral's density to the density of water (which is 1.0 g/cm^3). Specific gravity is most often used to identify minerals during field work.

MINERALS ARE USED FOR:

- Medicines
- Building materials (gypsum)
- Toothpaste (fluorite)
- Baby powder (talc)
- Electronics (quartz)
- Pencils (graphite)

...just to name a few! See the ESRT for more.