Mineral Groups in the Earths Crust

- Minerals that belong to the Earths Crust belong to 7 main groups.
 - 1. Silicates
 - 2. Sulfates
 - 3. Carbonates
 - 4. Oxides
 - 5. Halides
 - 6. Sulfides
 - 7. Native

Hints on Classifying Mineral Groups

- Mineral groups that end with "ate" and have an oxygen group in its chemical formula are one of the following;
- Silicates = Si + O_x; example Olivine (Mg,Fe)₂SiO₄
- Sulfates = $S + O_x$; example **Barite BaSO**₄
- Carbonates = $C + O_x$; example Calcite CaCO₃

Hints on Classifying Mineral Groups

- Minerals that end with 'ide' and have a metal (ie Na, K) in it's chemical formula are one of the following:
- Oxides = Metal + O; example Hematite Fe₂O₃
- Sulfides = Metal + S; example **Pyrite** FeS₂
- Halides = Metal + Cl, Br, F; example Fluorite CaF₂

Mineral Groups - Silicates

- Silicates
 - A mineral group that has silicon and oxygen as part of the atomic structure
 - More than 96% of the earths crust





- Silicates that form rocks are split into 2 groups
 - Sialic Silicates (Aluminosilicates)
 - Rich in silicon and aluminum
 - Main rock type in continents and makes up 85% of the crust
 - Light in color
 - Simatic Silicates
 - Rich in silicon and magnesium
 - Main rock type in the ocean floor, and make up less than 15% of the earths crust
 - Minerals are dark in color

Carbonates

- Compounds consisting of an atomic structure of one carbon and 3 oxygen (CO₃)
- The most common Carbonate is Calcite which makes up the rock Limestone (CaCO₃)
- Look for CO₃



Sulfates

- Compounds consisting of an atomic structure of one Sulfur and four Oxygen.
- Gypsum is an example of a sulfate.
 - $-(CaSO_4 \bullet 2H_2O)$
- Look for SO_x



Oxides

- compounds consisting of an atomic structure of oxygen combined with one or more metals.
- most common oxides are those of iron (Fe₂O₃) and aluminum (Al₂O₃), referred to as <u>Ore -</u> <u>Minerals</u>.
- Look for O plus Metal



Halides

- Compounds consisting of an atomic structure of chlorine or fluorine with sodium, potassium, or calcium.
- Halite (NaCl) is the most common halide. Often referred to as table salt.
- Look for CI, FI, Na, K, Ca



Sulfides

- Compounds consisting of an atomic structure of one or more metals combined with sulfur.
- common ore mineral.
- Examples: Pyrite (FeS₂), Galena (PbS), Sphalerite (ZnS).
- Look for S



Native Elements

- elements that occur uncombined in nature.
- commonly called native elements.
- Examples: Gold (Au), Silver (Ag), Copper (Cu), & Sulfur (S)
- These 'stand alone'



Sample Problem



• These are common Multiple Choice Questions

http://www.heartland.edu/divisions/ms/easc/rocksmins/rock_and_mineral_photo_index.htm