

CLASSIFICATION OF MINERALS BASED ON COMPOSITION.

1. Native Elements (By Itself)

Diamond - C  
Graphite - C  
Sulfur - S

2. Sulfides (Metal + Sulfur)

Chalcopyrite -  $\text{CuFeS}_2$   
Galena -  $\text{PbS}$   
Pyrite -  $\text{FeS}_2$   
Sphalerite -  $\text{ZnS}$

3. Oxides (Metal + Oxygen or Hydroxyl)

Quartz -  $\text{SiO}_2$  (see silicates)  
Bauxite -  $\text{Al}_2\text{O}_3$  + impurities  
Corundum -  $\text{Al}_2\text{O}_3$   
Hematite -  $\text{Fe}_2\text{O}_3$   
Limonite -  $\text{FeO}(\text{OH}) \cdot n\text{H}_2\text{O}$   
Magnetite -  $\text{Fe}_3\text{O}_4$   
Pyrolusite -  $\text{MnO}_2$

4. Carbonates (Metal + Carbonate)

Calcite -  $\text{CaCO}_3$   
Dolomite -  $\text{CaMg}(\text{CO}_3)_2$   
Siderite -  $\text{FeCO}_3$

5. Halides (Metal + Halogen)

Fluorite -  $\text{CaF}_2$   
Halite -  $\text{NaCl}$

6. Sulfates (Metal + Sulfate)

Barite -  $\text{BaSO}_4$   
Gypsum -  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

7. Phosphates (Metal + Phosphate)

Apatite -  $\text{Ca}_5(\text{PO}_4)_3(\text{F}, \text{Cl})$

8. Silicates (Metal + Silicate)

Amphibole Group  
Hornblende - Hydrous silicate of  
Ca, Na, Mg, Fe, Ti, & Al

Beryl -  $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$

Biotite - Hydrous silicate of  
Al, K, Mg, Fe

Chlorite - Mg, Fe, Al Silicate

Garnet - Fe Aluminosilicate

Kaolinite -  $\text{Al}_2(\text{Si}_4\text{O}_{10})(\text{OH})_2$

Kyanite -  $\text{Al}_2\text{SiO}_5$

Montmorillonite - Complex  
Ca, Na, Mg Aluminosilicate

Muscovite - Hydrous Silicate of  
Al, K

Olivine -  $(\text{Mg}, \text{Fe})_2\text{SiO}_4$

Plagioclase Feldspar Group

Anorthite Ca-Rich

Bytownite

Labradorite

Andesine

Oligoclase

Albite Na-Rich

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Aluminosilicate  
Na-Ca

Potash Feldspar Group

Orthoclase -  $\text{KAlSi}_3\text{O}_8$

Pyroxene Group

Augite - Ca, Fe, Mg Aluminosilicate

Quartz -  $\text{SiO}_2$

Serpentine (Asbestos) -

$\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$

Staurolite - Complex Fe

Aluminosilicate

Talc - Hydrous Mg - silicate

Topaz -  $\text{Al}_2(\text{SiO}_4)(\text{OH}, \text{F})_2$

Tourmaline - Complex silicate