

GY303 Petrology Laboratory  
Mineral Names and Formulae

Below are the names and chemical formulae for common rock-forming minerals that you are responsible for knowing for the laboratory portion of this course. In general, you should know the name and formula of a specific mineral when it is an important component of any specimen in the current weekly laboratory set. Note that the silicate minerals are broken down into the various groups of silicate structures.

I. Nesosilicates (single tetrahedra structure)

|                 |  |
|-----------------|--|
| Olivine         | $(\text{Mg,Fe})_2\text{SiO}_4$                                     |
| Garnet          | $(\text{Ca,Mg,Fe,Mn})_3\text{Al}_2\text{Si}_3\text{O}_{12}$        |
| Zircon          | $\text{ZrSiO}_4$   |
| Aluminosilicate | $\text{Al}_2\text{SiO}_5$  |
| Sphene          | $\text{CaTiSiO}_5$   |
| Staurolite      | $\text{Fe}_2\text{Al}_9\text{Si}_4\text{O}_{22}(\text{OH})_2$      |
| Chloritoid      | $(\text{Fe,Mg})_2\text{Al}_4\text{Si}_2\text{O}_{10}(\text{OH})_4$ |

II. Sorosilicates (double tetrahedra structure)

|         |   |
|---------|---|
| Epidote | $\text{Ca}_2\text{FeAl}_2\text{Si}_3\text{O}_{11}(\text{OH})$ |
|---------|---|

III. Cyclosilicates (ring structure)

|                         |  |
|-------------------------|--|
| Cordierite              | $(\text{Mg,Fe})_2\text{Al}_4\text{Si}_5\text{O}_{18} \cdot n(\text{OH})$                                   |
| Tourmaline <sup>a</sup> | $(\text{Na,Ca})(\text{Li,Mg,Al})(\text{Al,Fe,Mn})_6(\text{BO}_3)_3(\text{Si}_6\text{O}_{18})(\text{OH})_4$ |

IV. Inosilicates (single and double chain structure)

|                             |  |
|-----------------------------|--|
| Hypersthene (orthopyroxene) | $(\text{Mg,Fe})\text{SiO}_3$   |
| Diopside                    | $\text{Ca}(\text{Mg,Fe})\text{Si}_2\text{O}_6$   |
| Hedenbergite                | $\text{CaFeSi}_2\text{O}_6$  |
| Augite                      | $(\text{Ca,Na})(\text{Mg,Fe,Al})(\text{Si,Al})_2\text{O}_6$                                    |
| Jadite                      | $\text{NaAlSi}_2\text{O}_6$  |
| Wollastonite                | $\text{CaSiO}_3$   |
| Hornblende <sup>b</sup>     | $(\text{Ca,Na})_{2-3}(\text{Mg,Fe,Al})_5(\text{Si,Al})_2\text{Si}_6\text{O}_{22}(\text{OH})_2$ |

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<sup>a</sup>Not responsible for chemical formula

<sup>b</sup>Not responsible for chemical formula

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|               |  |
|---------------|--|
| Tremolite     | $\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$            |
| Actinolite    | $\text{Ca}_2(\text{Mg,Fe})_5\text{Si}_8\text{O}_{22}(\text{OH})_2$       |
| Glaucophane   | $\text{Na}_2\text{Mg}_3\text{Al}_2\text{Si}_8\text{O}_{22}(\text{OH})_2$ |
| Anthophyllite | $(\text{Mg,Fe})_7\text{Si}_8\text{O}_{22}(\text{OH})_2$                  |

V. Phyllosilicates (sheet structure)

|              |   |
|--------------|---|
| Muscovite    | $\text{KAl}_3\text{Si}_3\text{O}_{10}(\text{OH})_2$               |
| Biotite      | $\text{K}(\text{Mg,Fe})_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$ |
| Serpentine   | $\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$                   |
| Pyrophyllite | $\text{Al}_2\text{Si}_4\text{O}_{10}(\text{OH})_2$                |
| Talc         | $\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$                |
| Chlorite     | $(\text{Mg,Fe})_6(\text{Al,Si})_4\text{O}_{10}(\text{OH})_8$      |

VI. Tectosilicates (framework structure)

|            |                                      |
|------------|--------------------------------------|
| Quartz     | $\text{SiO}_2$                       |
| K-Feldspar | $\text{KAlSi}_3\text{O}_8$           |
| Albite     | $\text{NaAlSi}_3\text{O}_8$          |
| Anorthite  | $\text{CaAl}_2\text{Si}_2\text{O}_8$ |
| Nepheline  | $\text{NaAlSi}_3\text{O}_8$          |
| Leucite    | $\text{KAlSi}_2\text{O}_6$           |

VII. Oxides

|            |                           |
|------------|---------------------------|
| Magnetite  | $\text{Fe}_3\text{O}_4$   |
| Ilmenite   | $\text{FeTiO}_3$          |
| Rutile     | $\text{TiO}_2$            |
| Hematite   | $\text{Fe}_2\text{O}_3$   |
| Spinel     | $\text{MgAl}_2\text{O}_4$ |
| Ulvospinel | $\text{Fe}_2\text{TiO}_4$ |
| Corundum   | $\text{Al}_2\text{O}_3$   |

VIII. Phosphates

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

IX. Carbonates

|         |                 |
|---------|-----------------|
| Calcite | $\text{CaCO}_3$ |
|---------|-----------------|

GY-233  
Major Rock-forming Minerals

Dolomite

