

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	ZrSiO_4
Aluminosilicate	Al_2SiO_5
Sphene	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	$\text{Ca}_2\text{FeAl}_2\text{Si}_3\text{O}_{11}(\text{OH})$
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III. Cyclosilicates (ring structure)

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

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	CaSiO_3
Hornblende ^b	$(\text{Ca,Na})_{2-3}(\text{Mg,Fe,Al})_5(\text{Si,Al})_2\text{Si}_6\text{O}_{22}(\text{OH})_2$
Tremolite	$\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$

^aNot responsible for chemical formula

^bNot responsible for chemical formula

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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	SiO_2
K-Feldspar	KAlSi_3O_8
Albite	$\text{NaAlSi}_3\text{O}_8$
Anorthite	$\text{CaAl}_2\text{Si}_2\text{O}_8$
Nepheline	NaAlSiO_4
Leucite	KAlSi_2O_6

VII. Oxides

Magnetite	Fe_3O_4
Ilmenite	FeTiO_3
Rutile	TiO_2
Hematite	Fe_2O_3
Spinel	MgAl_2O_4
Ulvospinel	Fe_2TiO_4

VIII. Phosphates

Apatite	$\text{Ca}_5(\text{PO}_4)_3(\text{F,Cl,OH})$
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IX. Carbonates

Calcite	CaCO_3
Dolomite	$\text{CaMg}(\text{CO}_3)_2$