

## Ino- (chain) silicates

In this lab you will examine specimens of the inosilicate or chain silicate minerals. You will need to know the formulas indicated below in bold. For all other minerals, know the elemental constituents. For hornblende, it will be sufficient to know that is a hydrous silicate with very extensive solid solution with many different cations (a 'garbage bag' mineral).

### Inosilicates

A. Pyroxenes (Single Chain silicates); Pyroxenes come in two categories – orthorhombic and monoclinic:

1. Orthopyroxenes (orthorhombic):

Enstatite (**Mg<sub>2</sub>Si<sub>2</sub>O<sub>6</sub>**) -Ferrosilite (**Fe<sub>2</sub>Si<sub>2</sub>O<sub>6</sub>**) solid solution  
(we will use the names Enstatite and Bronzite in this solid solution series; minerals rich in ferrosilite are rare)

2. Clinopyroxenes (monoclinic):

Augite **Ca(Mg,Fe)Si<sub>2</sub>O<sub>6</sub>** (Major components are: Diopside (**CaMgSi<sub>2</sub>O<sub>6</sub>**) –  
Hedenbergite (**CaFeSi<sub>2</sub>O<sub>6</sub>**) solid solution)  
Acmite or Aegirine (**NaFe<sup>3+</sup>Si<sub>2</sub>O<sub>6</sub>**) (*Not in lab mineral set*)  
Jadeite (**NaAlSi<sub>2</sub>O<sub>6</sub>**) (*Not in lab mineral set*)  
Spodumene **LiAl<sub>2</sub>SiO<sub>6</sub>**

B. Pyroxenoids (single chains, but chains are 'twisted' and so these minerals do not show solid solution with ortho-, clino-pyroxenes):

Wollastonite (**Ca<sub>2</sub>Si<sub>2</sub>O<sub>6</sub>**)  
Rhodonite (**Mn<sub>2</sub>Si<sub>2</sub>O<sub>6</sub>**)

C. Amphiboles (Double Chain Silicates)

Anthophyllite **(Mg,Fe)<sub>7</sub>Si<sub>8</sub>O<sub>22</sub>(OH)<sub>2</sub>**  
Hornblende **(Ca,Na)<sub>2-3</sub>(Mg,Fe,Al)<sub>2</sub>Si<sub>6</sub>(Si,Al)<sub>2</sub>O<sub>22</sub>(OH)<sub>2</sub>**  
Tremolite **Ca<sub>2</sub>Mg<sub>5</sub>Si<sub>8</sub>O<sub>22</sub>(OH)<sub>2</sub>**  
Actinolite **Ca<sub>2</sub>(Mg,Fe)<sub>5</sub>Si<sub>8</sub>O<sub>22</sub>(OH)<sub>2</sub>**  
Cummingtonite **Ca<sub>2</sub>(Mg,Fe)<sub>5</sub>Si<sub>8</sub>O<sub>22</sub>(OH)<sub>2</sub>** (*Not in lab mineral set*)  
Glaucophane **Na<sub>2</sub>Mg<sub>3</sub>Al<sub>2</sub>Si<sub>8</sub>O<sub>22</sub>(OH)<sub>2</sub>**