

## Neso-, Soro- and Cyclo-silicates

In this lab you will examine specimens of the nesosilicate, cyclosilicate and sorosilicate mineral groups. For each specimen in your trays identify the mineral.

The numbered unknowns in your trays you will need to be able to identify on a quiz or exam, so consider these as practice specimens. You will also need to know either the principle elements that comprise these minerals or the exact formula of the mineral, as noted below. (If the formula is given below is in **bold**, then you must know the formula; if the formula is not in bold, or if no information is given, then you need only know be able to list the elemental constituents of the mineral. For example, for Epidote, you should know that it contains Ca, Al, Fe, Si, and OH).

As you identify your samples, report the geological and/or economic significance of each specimen - use your lecture and lab texts to obtain this information. You should examine all of the minerals set out for display. The samples selected will show a variety of appearances – when appearances strongly vary, as they do for many minerals, it is all the more crucial to identify such minerals based on physical properties (hardness, cleavage, luster, etc.) rather than color. A good strategy would be to test your classmates regarding formulas and identification as you work your way through the mineral sets.

### Nesosilicates

Alumino-silicates:

Andalusite (**Al<sub>2</sub>SiO<sub>5</sub>**)

Sillimanite (**Al<sub>2</sub>SiO<sub>5</sub>**)

Kyanite (**Al<sub>2</sub>SiO<sub>5</sub>**)

Topaz (**Al<sub>2</sub>SiO<sub>4</sub>(F,OH)<sub>2</sub>**)

Olivines:      Fayalite; Fa (**Fe<sub>2</sub>SiO<sub>4</sub>**)  
                  Forsterite; Fo (**Mg<sub>2</sub>SiO<sub>4</sub>**)  
                  Olivine (Fa-Fo mixture)

Titanite (=Sphene) (CaTiO(SiO<sub>4</sub>)).  
Staurolite (Fe<sub>2</sub>Al<sub>9</sub>O<sub>6</sub>(SiO<sub>4</sub>)<sub>4</sub>(O,OH)<sub>2</sub>)  
Zircon (ZrSiO<sub>4</sub>)

Garnets:        Andradite (Ca<sub>3</sub>Fe<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>)  
                  Grossular (Ca<sub>3</sub>Al<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>)  
                  Almandine (Fe<sub>3</sub>Al<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>)  
                  Pyrope (Mg<sub>3</sub>Al<sub>2</sub>Si<sub>3</sub>O<sub>12</sub>)

### Cyclosilicates

Beryl (Be<sub>3</sub>Al<sub>2</sub>Si<sub>6</sub>O<sub>18</sub>)

Tourmaline ((Na,Ca)(Li,Mg,Al)(Al,Fe,Mn)<sub>6</sub>(BO<sub>3</sub>)<sub>3</sub>(Si<sub>6</sub>O<sub>18</sub>)(OH)<sub>4</sub>)

### Sorosilicates

Epidote (Ca<sub>2</sub>(Al,Fe)Al<sub>2</sub>O(SiO<sub>4</sub>)(Si<sub>2</sub>O<sub>7</sub>)(OH))