**Ge 114**

**Hand Specimen Lab Exercise 5**

Silicates III: Sheet Silicates

**Items in bold type will be written up and handed in as part of the lab report.**

Goals:

* Learn about the silicate classification system for sheet silicates
* Learn about the sheet silicate structural classification
* Identify 10 major minerals in these two groups

I) **Explain the structural characteristics of minerals in this group**. Looking at one or more of the mineralogy textbooks will be helpful.

II) The minerals to be studied in this lab are:

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Sheet Silicates:

*Micas* (muscovite, biotite, phlogopite, lepidolite)

*Chlorite*

*Serpentine* (antigorite, chrysotile)

Kaolinite Montmorillonite Talc

Plus one mineral of your choice from the collection, not on this list

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**Prepare a brief written description of your characterization of these minerals, in the form of a table. This table should include the following:**

- Mineral name, formula, and SiO2 polymerization (i.e., tectosilicate, orthosilicate, etc.). For *mineral groups*, you may list a general formula for the group and distinguish the minerals in that group by noting the elemental substitutions into each site for each mineral.

- Physical properties and attributes such as: cleavage or fracture, crystal form or habit, luster, color, density to the hand, and possibly magnetism, taste, and other properties if relevant. You may describe the general physical properties of all minerals in a *mineral group* once, instead of for each mineral, but be sure to include how to distinguish one mineral from another in a particular group (for example, note color differences)

- Indicate the three most important diagnostic properties of each mineral.

- Include variations in these properties among different specimens of the same mineral in the Dana and working collections.

- Geological occurrences (rock types) and economic importance.

III) **Explain the following features of sheet silicates:**

- What are “T” layers?

- What are “O” layers?

- Which species from this lab are “trioctahedral” micas?

- Which species from this lab are “dioctahedral” micas?

Often, the phrases “sheet silicate” and “mica” are used interchangeably. **Why is this not technically correct?**

Other chain silicates are in the Dana Collection. You may examine these as your time allows and interests dictate!