

Unit B: Components of Soil

Lesson 2: Minerals of Soil

Terms

- Sand
- Silt
- Clay
- Triangle
- Tetrahedron
- Octahedron
- Cube
- Dodecahedron

- I. Chemical formation of soil minerals differ due to the general make up of each mineral.
 - A. Sand formation is very large with a lot of surface area. This causes the particles to lose water quickly and not form any bonds to one another.
 - B. Silt is small and can form some bonds. However, these bonds can be easily broken and do not hold water in place for long periods of time.
 - C. Clay is so small that the chemical formation causes the particle to form very tight bonds to water and to one another. These bonds are so strong that it will hold water in place for long periods of time and can prevent water from passing through.

II. Minerals come in many different shapes. These shapes are caused by how the mineral is formed. The common shapes are as follows:

A. Triangle

1. 2 sides

B. Tetrahedron

1. 4 sides

C. Octahedron

1. 8 sides

D. Cube

1. 6 sides

E. Dodecahedron

1. 12 sides

III. Minerals crack for one reason, water.

- A. Sand minerals are broken down rock due to the rain hitting on the rock for many years. These minerals break down smaller and smaller until they become sand, and there are variations in sizes of sand from larger sand to very small sand, almost like silt.
- B. Silt minerals crack just like the sand, due to the rain. However, it does not start as a rock, it starts as silt. These silt particles will crack from the rain and the loss of other ions. These ions like aluminum and iron will move from one particle to another due to the movement of water. When the ions move, they can cause the mineral they left to crack due to the missing piece.
- C. Clay cracks more often than the other two. They crack so easily because their structure is based on the very strong bond they have with the water. If the water is moved from the mineral, that mineral will crack.

IV. Mineral color seen by the naked eye varies from location to location. Natural mineral color is relatively the same, however.

A. Mineral color you can see with your eye is based on age of soil, organic matter, and what is found in the soil.

1. Red soil minerals are very old and have oxidized.
2. Dark minerals have a lot of organic matter found in the soil.
3. Other colored soil has different minerals found in it, such as salt.

B. Natural soil color is gray.

1. The only way natural soil color is found in poorly or somewhat poorly drained soil. This soil has the inorganic substances, like iron and aluminum, removed from the soil in concentrated in other areas, leaving the natural soil mineral color of gray revealed

Review/Summary

1. Name three different shapes that minerals can come in.
2. What is the NATURAL color of soil minerals?
3. Which mineral forms the strongest bonds?
4. Which mineral forms the weakest bonds?
5. Which mineral holds the middle strength bond?
6. What is the main reason minerals crack?
7. How do each of the minerals crack differently?