

Chapter 4: Minerals

Section 1: Properties of Minerals

What are the characteristics of a mineral?

- A mineral must be:
 - Naturally occurring: Substance must be natural not man made, including construction materials made from minerals
 - Inorganic: Substance can not come from materials that were once living
 - Solid: Substance must have a definite volume and shape with tightly packed particles

What are the characteristics of a mineral?

- **A mineral must have:**
 - **Crystal Structure:** The particles line up in a unique pattern that repeats over and over again
 - The repeating pattern forms a crystal that has definite flat sides called faces that meet at sharp edges or corners
 - **Definite Chemical Composition:** A mineral always contains the same elements in the same proportion
 - These elements bond together to form compounds in which the elements lose their identities

How are minerals identified?

- Each mineral has its own specific properties that can be used to identify it. These properties include:
 - Hardness/Mohs Hardness Test
 - A mineral can scratch any other mineral that is softer than itself
 - If a mineral is not on the scale, a mineral on the scale is used to scratch the unknown mineral
 - Color
 - Color can be used to identify only those few minerals that always have their own characteristic color

How are minerals identified?

- Streak: The streak of a mineral is the color of its powder
 - The streak of a mineral can be observed by rubbing the mineral on a unglazed tile
 - The color of a mineral may vary, but its streak does not
- Luster: Describes how a mineral reflects light from its surface
 - Minerals that contain metal or a glassy finish have luster

How are minerals identified?

- Density: Each mineral has a characteristic density, meaning it does not change for that substance
- Crystal Shape: Minerals are classified into six groups depending on the number and angle of the crystal faces

How are minerals identified?

- Cleavage & Fracture: The way a mineral breaks apart can help to identify it
 - Cleavage characterizes a mineral that breaks evenly
 - Fracture describes a mineral that breaks in a unusual way
- Special Properties
 - Magnetism
 - Fluorescence
 - Radioactive
 - Electrical