

Lecture 9

Silicate Minerals

- Known as the rock forming minerals
- Dominate the Earth's crust
- The anionic unit is the silica-oxygen tetrahedron

Double-chain Silicates

- Double chain of Silica tetrahedral bonded together

Single-chain silicates

- Single chain structures bonded with Fe and Mg

Sheet Silicates

- 2 dimensional sheets of linked tetrahedral
- Characterized by one direction of perfect cleavage

Framework silicates

- All 4 oxygen's in the Silica tetrahedral are shared

Silicate Minerals

- Silica tetrahedral link together by sharing oxygen's
- More shared oxygen = higher Si:O ratio

Non-Silicate Minerals

Native Metals

- Solids composed of metal atoms

Oxides

- Metal cations bonded to oxygen anions

Sulfides

- Metal cation bonded to a sulfate anion

Halides

- Cation bonded to halogen anion

Carbonates

- Cation bonded to CO_3^{2-} anion group

Gems

- Gems are cut and polished to be used in jewelry
- Minerals with special value
- Rarity
- Beauty

Diamonds

- Diamonds originate under extremely high pressure
- Rifting causes deep mantle rock to move upward
- Diamonds are found in kimberlite pipes

Other Earth Materials

Organic compounds

- Organic carbon containing compounds

Glasses

- Solid substance in which atoms are not arranged in an orderly fashion

Melts

- Solid material heated to form liquids. Magma rock melt below Earth's surface. Lava -rock melt at Earth's surface

Volatiles

- Materials easily transformed into gas at Earth surface

What you should know

- The definition of a mineral
- How chemical bonds influence mineral properties
- Mineral characteristics
- Basic mineral groups