

Minerals

Geology: Slides 11-21

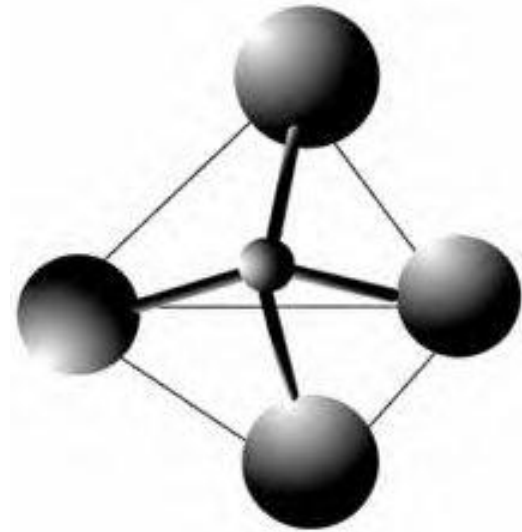
Minerals

- For an object to be considered a mineral it must meet the following criteria:
 - It must be naturally occurring
 - It must be a solid
 - It must have a definite chemical composition
 - It must have a definite crystal structure
 - It must be inorganic (contains nothing that was ever living)

Mineral Types

1.) Silicates

- 90% of all minerals belong to this group
- Silicon + a metal (Al, Fe, etc.)
- Atoms for a silica tetrahedron
- The silica tetrahedron causes the minerals to have their distinct crystal shapes.
- Feldspars – most common type of silicate found in the Earth's crust (Al has replaced some of the Si in the tetrahedron)



Some Silicate Minerals



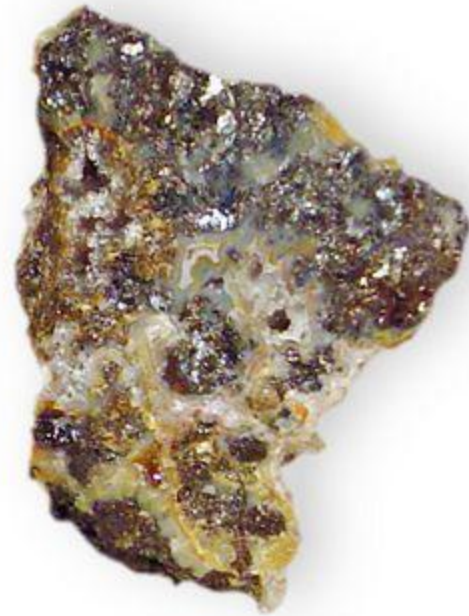
Mineral Types

- 2.) Carbonates
 - CO_3 bonded to a metal (common around here)
 - Generally react to acids (creating rocks that are easily dissolved by acid rain making caves and sink holes)



Mineral Types

- 3.) Iron Oxides and Iron Sulfides
 - Iron combined with oxygen and sulfur
 - Very heavy, dense minerals
 - Resemble a piece of metal



Identifying Minerals

- Minerals are identified using the following properties:

(Some properties will be useful for some minerals and useless for others.)

Identifying Minerals

- 1.) Color – least useful identification property
- 2.) Luster – The way a mineral reflects light
(vitreous [glassy], pearly, metallic, non-metallic [earthy])
- 3.) Crystal Shape – atoms forming distinct
crystal patterns

Identifying Minerals

- 4.) Hardness
 - The resistance of a mineral to being scratched
 - Uses the Mohs Hardness Scale
 - Mohs Scale ranks minerals from 1 – 10 (1 is softest and 10 is the hardest)
 - Talc = 1 and Diamond = 10
(not always whole numbers)

Identifying Minerals

- 5.) Streak
 - The color of a mineral's powder
 - To obtain the mineral's powder you rub the mineral across a Streak Plate (porcelain)
 - Mineral color and the mineral streak are not necessarily the same. (All minerals do not have a streak – some are too hard)

Identifying Minerals

- 6.) Cleavage and Fracture
 - The way in which a mineral breaks or splits
 - Cleavage = smooth break on a flat surface
 - Fracture = rough break with jagged edges

Identifying Minerals

- 7.) Specific Gravity
 - Ratio of the mass of a mineral compared to the mass of an equal volume of water

Identifying Minerals

- 8.) Special Properties

- Taste

- Odor

- Sound

- Radioactivity

- Fluorescence

- Double refraction

- Reacts with acid

- Magnetic