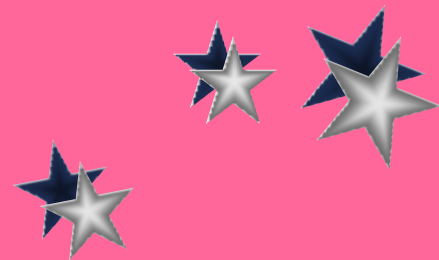


Unit 1 - Matter

III. Properties & Changes in Matter (p.11-14)

- ◆ Extensive vs. Intensive
- ◆ Physical vs. Chemical



A. Extensive vs. Intensive

✦ Extensive Property

- ✦ depends on the amount of matter present

✦ Intensive Property

- ✦ depends on the identity of substance, not the amount

A. Extensive vs. Intensive

✦ Examples:

✦ boiling point

intensive

✦ volume

extensive

✦ mass

extensive

✦ density

intensive

✦ conductivity

intensive

B. Physical vs. Chemical

✦ Physical Property

- ✦ can be observed without changing the identity of the substance

✦ Chemical Property

- ✦ describes the ability of a substance to undergo changes in identity

B. Physical vs. Chemical

✦ Examples:

- | | |
|--------------------|----------|
| ◆ melting point | physical |
| ◆ flammable | chemical |
| ◆ density | physical |
| ◆ magnetic | physical |
| ◆ tarnishes in air | chemical |

B. Physical vs. Chemical

✦ Physical Change

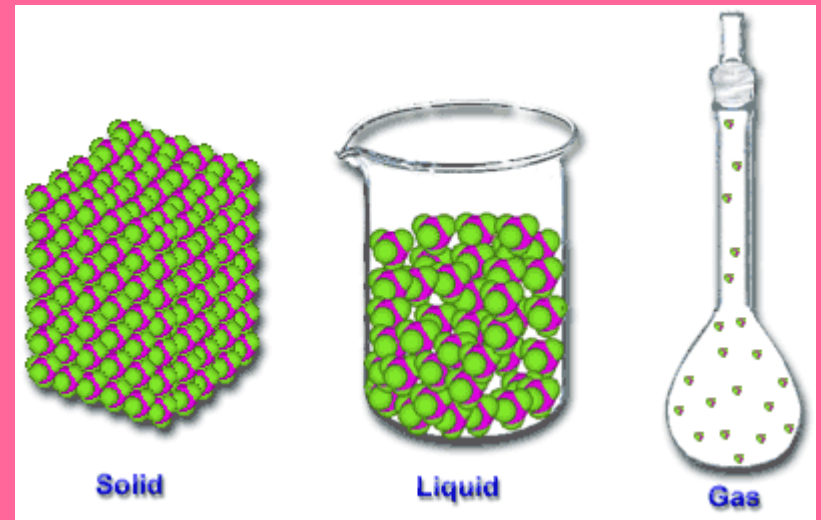
- ◆ changes the form of a substance without changing its identity
- ◆ properties remain the same

✦ Chemical Change

- ◆ changes the identity of a substance
- ◆ products have different properties

Physical Changes in Matter

- ✦ change in a substance that doesn't change the identity of the substance
- ✦ Ex. grinding, cutting, melting, boiling
- ✦ Can be reversible, or irreversible
- ✦ Includes all changes of state (physical changes of a substance from one state to another)



Chemical Changes in Matter

- ✦ a change in which a substance is converted into a different substance
- ✦ same as chemical reaction
- ✦ doesn't change the amount of matter present
- ✦ reactants- substances that react
- ✦ products- substances that form
- ✦ Arrow points from the reactants to the new products

B. Physical vs. Chemical

- ✦ Signs of a Chemical Change (Reaction)
 - ◆ change in color or odor
 - ◆ formation of a gas (bubbling or fizzing)
 - ◆ formation of a precipitate (solid)
 - ◆ change in light or heat

Conservation of Mass

- ✦ During any chemical reaction, the mass of the products is always equal to the mass of the reactants.
- ✦ All the mass can be accounted for:
 - ✦ Burning of wood results in products that appear to have less mass as ashes; where is the rest?
- ✦ Law of conservation of mass

In the pictures how do you know right away that a chemical change took place?

19

Figure 2.15 Conservation of Mass

reactants = product
43.43 g Original mass = 43.43 g Final mass



B. Physical vs. Chemical

✦ Examples:

- | | |
|-----------------------|----------|
| ◆ rusting iron | chemical |
| ◆ dissolving in water | physical |
| ◆ burning a log | chemical |
| ◆ melting ice | physical |
| ◆ grinding spices | physical |