

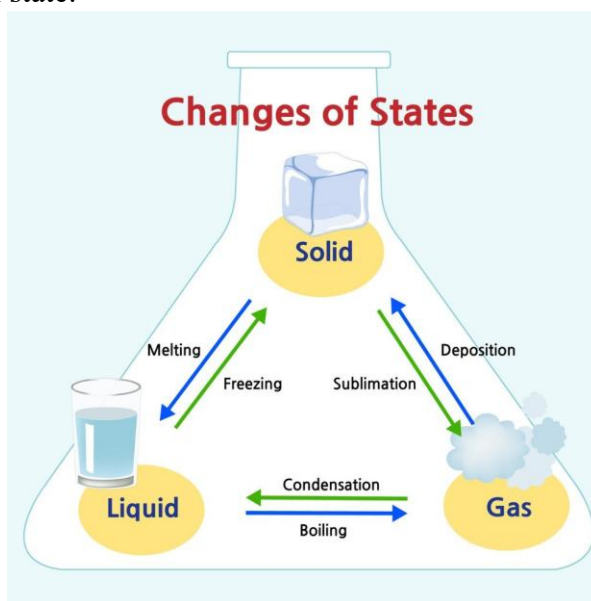
Chemical and Physical Changes

Key Concepts

- Matter can be described based on physical and chemical changes it undergoes
- Matter can be classified by how it responds to physical and chemical changes

Physical Changes

- a change that alters a substance without changing its chemical identity or composition
- when a substance is altered but the properties of the substance remain the same. A change of state due to melting or boiling does not produce a new substance
- diagram of change of state:



Chemical Change

- when one type of matter changes to produce one or more different types of matter
- the matter that is produced has a different identity and different properties from the original matter.
- Some chemical changes are difficult to reverse
- Ex. Turning ash from a fire back into wood
- Some chemical changes are easy to reverse (ie recharging a battery)

Chemical Reactions

- One or more pure substances interact to form a different substance or substances
- Elements can react to form compounds
- Compounds and elements can react to form new compounds
- Compounds can break apart to form elements and simpler compounds
- Ex fire:

Evidence that a chemical change may have occurred

- Change of colour (not due to mixing 2 colours)
- Formation of a new substance (a precipitate -solid, gas (bubbles forming)
- Heat or light is released or absorbed
- A change of state may occur

Demo: Carbon Tree

Law of Conservation of Mass

- Antoine Lavoisier performed experiments measuring the mass of substances before (reactants) and after (the products)
- Reactants -substances taking part in the chemical change
- Products – substances formed by the chemical change.
- Over and over he saw that the mass of reactants was equal to the mass of products
- This was summarized as the law of conservation of mass
- According to this law, mass is neither was created nor destroyed during a chemical reaction – it is conserved
- Mass of reactants = mass of products