

CHAPTER HIGHLIGHTS

The Kinetic-Molecular Theory of Matter

Vocabulary

kinetic-molecular theory	diffusion
ideal gas	effusion
elastic collision	real gas

- The kinetic-molecular theory of matter can be used to explain the properties of gases, liquids, and solids.
- The kinetic-molecular theory of gases describes a model of an ideal gas.
- Gases consist of large numbers of tiny, fast-moving particles that are far apart relative to their size.

Liquids

Vocabulary

fluid	vaporization
surface tension	evaporation
capillary action	freezing

- The particles of a liquid are closer together and more ordered than those of a gas and are less ordered than those of a solid.
- Liquids have a definite volume and a fairly high density, and they are relatively incompressible. Like gases, liquids can flow and thus are considered to be fluids.

Solids

Vocabulary

crystalline solids	melting point
crystal	supercooled liquids
amorphous solids	crystal structure
melting	unit cell

- The particles of a solid are not nearly as free to move about as those of a liquid or a gas are.
- Solids have a definite shape and may be crystalline or amorphous. They have a definite volume and are generally nonfluid.
- A crystal structure is the total three-dimensional array of points that describes the arrangement of the particles of a crystal.
- Unlike crystalline solids, amorphous solids do not have a highly ordered structure or a regular shape.

Changes of State

Vocabulary

phase	freezing point
condensation	molar enthalpy of fusion
equilibrium	sublimation
equilibrium vapor pressure	deposition
volatile liquids	phase diagram
boiling	triple point
boiling point	critical point
molar enthalpy of vaporization	critical temperature
	critical pressure

- A liquid in a closed system will gradually reach a liquid-vapor equilibrium as the rate at which molecules condense equals the rate at which they evaporate.
- When two opposing changes occur at equal rates in the same closed system, the system is said to be in dynamic equilibrium.

Water

- Water is a polar covalent compound.
- The structure and the hydrogen bonding in water are responsible for its relatively high melting point, molar enthalpy of fusion, boiling point, and molar enthalpy of vaporization.