

Unit 8: Solids, Liquids, Changes in Phase, and Intermolecular Forces

adapted from http://www.phschool.com/advanced/lesson_plans/chem_brown_2003/index.html

Objectives:

- Understand the kinetic molecular theory explanation of physical states.
- Describe the types of intermolecular force and be able to state the type expected for a substance knowing its molecular structure.
- Know the meaning of viscosity, surface tension, critical temperature, and critical pressure, and how they relate to the intermolecular force.
- Understand how vapor pressure depends on intermolecular attraction and temperature.
- Define boiling point.
- From the heat capacities and enthalpies of state change needed, be able to calculate the amount of heat to change a substance from one temperature and state to another.
- Predict the type of solid (ionic, molecular, metallic, or covalent network) a substance is and the properties it has because of this.

Key Words:

intermolecular force	viscosity	critical temperature	triple point
condensed phase	surface tension	critical pressure	crystalline solid
ion-dipole force	capillary action	vapor pressure	amorphous solid
dipole-dipole force	phase change	dynamic equilibrium	crystal lattice
London dispersion force	heat (enthalpy) of fusion	volatile	molecular solid
polarizability	heat (enthalpy) of vaporization	boiling point	covalent network solid
hydrogen bonding	heat (enthalpy) of sublimation	phase diagram	ionic solid
		normal melting point	metallic solid

Tips:

- Covalent bonds are not intermolecular forces.
- Hydrogen bonds are intermolecular, not intramolecular, forces.
- Ionic substances do not have molecules.
- Ion-dipole occurs only in mixtures.

