

## Chapter 9, Objectives

### Terms:

dipole-dipole force  
hydrogen bonding  
London dispersion forces  
crystalline solid  
amorphous solid  
crystal lattice  
metallic solid

network (covalent) solid  
boiling point temperature  
molecular solid  
ionic solid  
vaporization  
evaporation  
condensation

freezing  
sublimation  
vapor pressure  
enthalpy (heat) of fusion  
enthalpy (heat) of vaporization

### You should be able to:

1. compare the three physical states of matter,
2. describe the relative strengths of the three types of intermolecular bonds,
3. describe how dispersion forces are affected by molecular shape and size,
4. explain how and why vapor pressure changes with temperature,
5. given a list of compounds be able to list them in order of increasing rate of evaporation, melting point, boiling point, and vapor pressure, and explain your answer,
6. classify each change in state as exothermic or endothermic,
7. explain why liquids evaporate by describing what happens at the molecular level and explain why the liquid gets cooler as it evaporates,
8. explain what is required in order for a liquid to boil,
9. draw a heating curve for a substance such as water; label each part of the curve and describe what's happening at the molecular level at each part of the curve,
10. explain why temperature remains constant during melting and boiling,
11. calculate the energy required to raise the temperature of a given mass of substance from one temperature to another given the specific heat of the solid and liquid, the heat of fusion, and the heat of vaporization,
12. explain why the heat of vaporization for a substance is usually considerably larger than the heat of fusion,
13. given properties for a substance classify it as ionic, molecular, metallic, or network covalent,
14. explain why metallic solids are malleable and good conductors whereas network solids are not,
15. given a list of substances, classify each as ionic, molecular, metallic, or network covalent.