

Chemistry 102 Winter 2010

Announcements

1. First midterm exam on Jan. 27, Wednesday over Chapter 9 and Chapter 10.1-10.5 and 10.7.

Arrive early to find your assigned seat.

Bring a calculator.

Today

1. Phase changes

Phase change between liquid and gas

Fig. 11.16, p. 391.

dynamic equilibrium: forward and reverse processes occur simultaneously and at the same rates.

liquid and gas (vapor) in dynamic equilibrium
Fig. 11.19, p. 383.

vaporization (evaporation): molecules at the surface of a liquid gain energy and move into the gas phase (become gaseous molecules).

condensation: molecules in the gas phase lose energy and enter the liquid phase (become liquid molecules).

vaporization-condensation equilibrium

Example: capped water bottle

equilibrium vapor pressure (vapor pressure): the pressure due to molecules leaving the liquid state and entering the gaseous state.

When saying “vapor pressure,” a person is actually saying “vapor pressure of a liquid.” The presence of a liquid is implied by the term vapor pressure.

What is the difference between evaporation and boiling?

evaporation

boiling

boiling: the condition of the vapor pressure of a liquid being equal to the external pressure above the liquid's surface; molecules throughout the liquid gain energy and move into the gas phase (bubbles). Fig. 11.6, p. 380.

normal boiling point: the temperature at which boiling occurs with 1 atm of external pressure.

Fig. 11.5, p. 380.

Why does rubbing alcohol evaporate so quickly as compared to water?

Rubbing alcohol, aka, C_3H_7OH , $CH_3C(OH)CH_3$, $(CH_3)_2COH$, and isopropyl alcohol.

What IMF's exist? What happens to vapor pressure?

See Fig. 11.5, p. 380.

Properties of a liquid due to IMF's

cohesion: attractive forces between molecules in a substance. Impacts boiling point, spherical droplets surface tension

viscosity (has shape/entanglement factors, too)

adhesion: attractive forces between molecules of different substances. Impacts ...

Gecko sticky forces
(dispersion, London)

capillary action
and meniscus

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OWL HW deadlines

Due Date	Assignment
1/27/10	9 – Molecular Structures
1/27/10	10 – Gases and the Atmosphere
2/10/10	11 – Liquids, Solids, and Materials
2/24/10	12 – Chemical Kinetics
3/15/10	13 – Chemical Equilibrium

Exam review

1. Lecture notes and examples.
2. OWL HW.
3. Recitation HW and quizzes.
4. Extra Chapter 9 Problems: 1-12, 22-29, 31-34, 37-39, 43-52.
5. Extra Chapter 10 Problems: 16, 20-43, 68-80.

Before next lecture (Feb. 1),

1. Read and study Chapter 11.1-11.3