

Chapter 12 Lecture Worksheet 3

Name:

UGA ID:

Instructions:

- Please enter your first and last name as it appears on the eLC roster (do not use a nickname).
- Your UGA myID is a combination of letters and numbers (example: mine is sre13137)
- Download and print the worksheet.
- For multiple choice questions: **write** the letter corresponding to your answer in the box.
- For numeric questions: **write** the answer in the box using the correct number of significant figures.
- If you do not have a printer, type the answers and upload the template to Gradescope. On separate sheets of paper, upload your work to eLC.
- Upload this worksheet to Gradescope by 11:59 p.m. on Monday, August 31. **Do not** upload additional pages showing your work to Gradescope.

1. Which of the following phase changes is(are) endothermic?

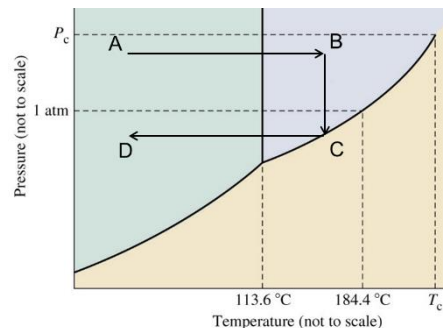
- | | | |
|-----------------|-----------------|---------------|
| 1. melting | 3. sublimation | 5. deposition |
| 2. vaporization | 4. condensation | 6. Freezing |

- A. 1, 2, and 3
B. 4, 5, and 6
C. 1 and 2 only
D. 4 and 6 only
E. some other combination



2. To the right is the phase diagram for iodine. Which of the following transitions occur when the temperature and pressure conditions are changed from A to B to C to D?

- A. $l \rightarrow s \rightarrow g \rightarrow l$
B. $s \rightarrow l \rightarrow g \rightarrow s$
C. $g \rightarrow s \rightarrow l \rightarrow g$
D. $s \rightarrow l \rightarrow g \rightarrow l \rightarrow s$
E. $s \rightarrow g \rightarrow l \rightarrow g \rightarrow s$



3. Calculate the amount of heat that must be released to convert 20.0 g of mercury vapor at 387 °C to liquid mercury at 307 °C (in kJ).

Hg (m.p. -39 °C, b.p. 357 °C)

Heat of fusion = 11.6 J/g @ -39 °C

Heat of vaporization = 292 J/g @ 357 °C

Specific Heat (solid) = 0.141 J/g °C

Specific Heat (liquid) = 0.138 J/g °C

Specific Heat (gas) = 0.104 J/g °C



4. Ethyl chloride, $\text{C}_2\text{H}_5\text{Cl}$, is used as a local anesthetic. It works by cooling tissue as it vaporizes. The heat of vaporization is 26.4 kJ/mol. How much heat could be removed by 60.0 g of ethyl chloride?

5. The intermolecular attractions in liquid A are considerably larger than in liquid B. Which is **not** expected to be larger for A than for B?

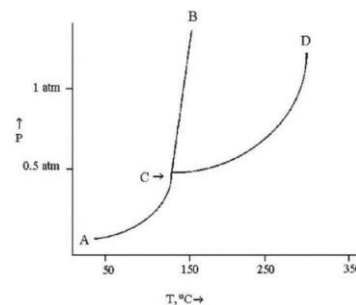
- A. The vapor pressure at 20 °C.
- B. The critical temperature.
- C. The heat of vaporization.
- D. The temperature at which the vapor pressure is 0.5 atm.

6. Which of the following best explains why ΔH_{vap} is usually higher than ΔH_{fusion} ?

- A. Vaporization occurs at high temperature.
- B. Vaporization involves the breaking of bonds within molecules.
- C. Vaporization involves the breaking of all bonds between molecules.
- D. Vaporization increases the entropy of molecules.

7. According to the diagram, the solid phase of this substance

- A. has the same density as the liquid phase.
- B. is less dense than water.
- C. is less dense than the liquid phase.
- D. is more dense than the liquid phase.



8. What is the edge length of a face-centered cubic unit cell made up of atoms having a radius of 200 pm?

9. Which of the following statements is **not** consistent with the properties of a molecular solid?

- A. a compound that conducts electricity when molten
- B. a low melting solid
- C. a solid formed by the combination of two nonmetallic elements
- D. a solid that is a nonconductor of electricity

10. How many unit cells share an atom that is on the edge of a cubic unit cell?

- A. 1
- B. 2
- C. 4
- D. 8

11. From the plot of vapor pressure as a function of temperature shown below, the normal boiling point for tert-butyl alcohol is approximately

