

## CHAPTER 10 INTERMOLECULAR FORCES

## Intermolecular Forces

## 1. London forces are:

- A. the attractions between molecules caused by instantaneous dipoles.
- B. the attraction between molecules which have hydrogens connected to a nitrogen, oxygen, or fluorine atom.
- C. the attraction between polar molecules resulting from the attractions of permanent partial positive and partial negative charges.
- D. the attraction between an ion and a polar molecule.
- E. an energy field created by all living things which surrounds us and penetrates us and binds the Galaxy together.

## 2. Which compound, NaCl or KCl has the most negative lattice energy, and what is the reason for your choice?

- A. NaCl has the more negative lattice energy because  $\text{Na}^+$  is larger than  $\text{K}^+$ .
- B. NaCl has the more negative lattice energy because  $\text{Na}^+$  is smaller than  $\text{K}^+$ .
- C. KCl has the more negative lattice energy because  $\text{K}^+$  is larger than  $\text{Na}^+$ .
- D. KCl has the more negative lattice energy because  $\text{K}^+$  is smaller than  $\text{Na}^+$ .
- E. none of the above

3. What intermolecular forces are present in a sample of  $\text{I}_2$ ?

- A. London forces only
- B. Dipole-dipole forces only
- C. Hydrogen bonding only
- D. London forces and dipole-dipole forces
- E. London forces, dipole-dipole forces, and hydrogen bonding.

4. What intermolecular forces are present in a sample of  $\text{CH}_3\text{OH}$ ?

- A. London forces only
- B. Dipole-dipole forces only
- C. Hydrogen bonding only
- D. London forces and dipole-dipole forces
- E. London forces, dipole-dipole forces, and hydrogen bonding.

5. What is the **strongest** intermolecular force present in a sample of  $\text{CH}_3\text{OH}$ ?

- A. London forces
- B. Dipole-dipole forces
- C. Hydrogen bonding
- D. Ion-dipole forces

6. What is the **strongest** intermolecular force present in a sample of  $\text{CH}_3\text{CH}_3$ ?

- A. London forces
- B. Dipole-dipole forces
- C. Hydrogen bonding
- D. Ion-dipole forces

7. Which compound has the higher boiling point,  $\text{CH}_3\text{Cl}$  or  $\text{CH}_3\text{OH}$ ?

- A.  $\text{CH}_3\text{Cl}$
- B.  $\text{CH}_3\text{OH}$
- C. Both compounds have the same boiling point.

## The next two questions relate to the following pair of compounds:



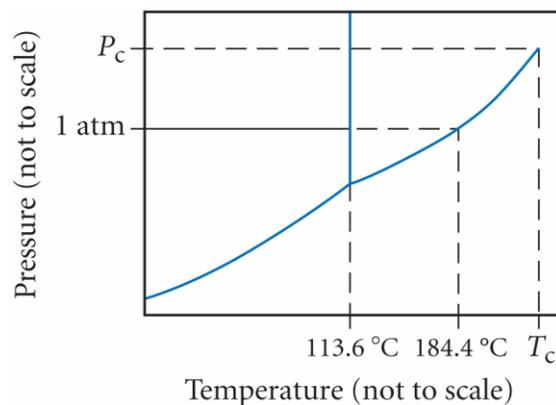
## 8. Which compound has the higher vapor pressure?

- A.  $\text{CH}_3\text{OCH}_3$
- B.  $\text{CH}_3\text{CH}_2\text{OH}$

## 9. Which compound has the higher boiling point?

- A.  $\text{CH}_3\text{OCH}_3$
- B.  $\text{CH}_3\text{CH}_2\text{OH}$

Consider the phase diagram for iodine shown below:

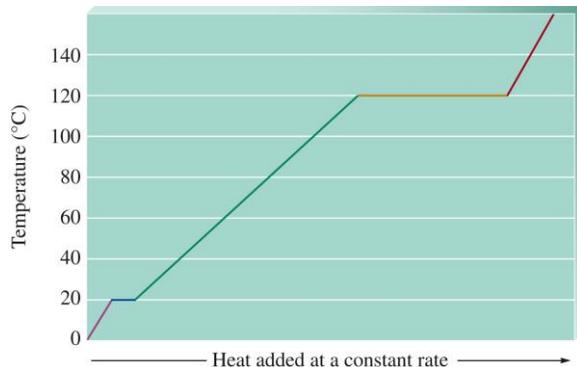


## 10. What is the normal boiling point for iodine?

- A. 113.6°C
- B. 184.4°C
- C. 0.0°C
- D. 100.0°C

11. What is the melting point for iodine at 1 atm?  
A. 113.6°C  
B. 184.4°C  
C. 0.0°C  
D. 100.0°C
12. What phase is present at room temperature (22°C) and normal atmospheric pressure?  
A. solid  
B. liquid  
C. gas
13. What phase is present at 186°C and 1.0 atm?  
A. solid  
B. liquid  
C. gas
14. What process occurs when iodine at 100°C and 1 atm of pressure is heated to 140°C at 1 atm of pressure?  
A. melting  
B. evaporation  
C. condensation  
D. freezing  
E. sublimation

Use the heating-cooling curve shown below to answer the following questions.



15. What is the freezing point of the material?  
A. 0°  
B. 20°  
C. 50°  
D. 100°  
E. 120°
16. What is the boiling point of the material?  
A. 0°  
B. 20°  
C. 50°  
D. 100°  
E. 120°

17. Which part of the curve represents the heat of vaporization of the material?

- A. The rising slope between 0° and 20°.  
B. The flat line at 20°.  
C. The rising slope between 20° and 120°.  
D. The flat line at 120°.  
E. The rising slope from 120° to 140°.