

What I Know

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. Liquids can form spherical elastic film to minimize surface area. What intermolecular forces are responsible for the formation of this film in water?
   a. dipole-induced dipole
   b. H-bonding
   c. ion-induced dipole
   d. London dispersion forces

2. Which among the following is the amount of energy required to stretch or increase the surface of a liquid by a unit area (ex., 1 cm^2)?
   a. heat of vaporization
   b. specific heat
   c. surface tension
   d. vapour pressure

3. How is the ability of water molecules to move against gravity referred to?
   a. capillary action
   b. surface tension
   c. temperature
   d. viscosity

4. Substances like heavy syrup and molasses flow slower than water. How is the ability of these substances to resist flow called?
   a. capillary action
   b. pressure
   c. surface tension
   d. viscosity

5. What is the term that pertains to the pressure exerted by the vapor from the evaporation of a liquid or solid above a sample of the liquid or solid in a closed container?
   a. boiling point
   b. capillary action
   c. surface tension
   d. vapour pressure

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6. What is true about liquids with strong intermolecular forces?
   a. Vapour pressure is low.
   b. Vapour pressure is high.
   c. Viscosity is low.
   d. Viscosity is immeasurable.

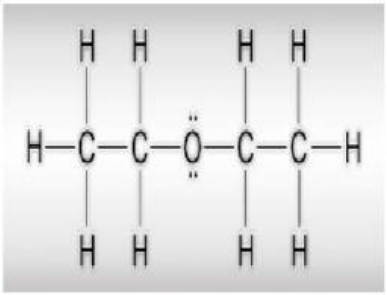
7. What happens when the vapour pressure of a liquid becomes equal to the atmospheric pressure?
   a. The liquid will boil.
   b. The vapour will condense.
   c. Melting of the solid form will start.
   d. There will be freezing of the liquid.

8. Using the chart on the vapour pressure of the four substances, which among them has the lowest boiling point?

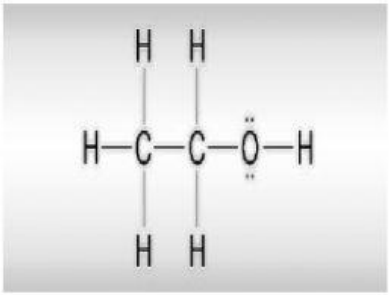
Substance	Vapour Pressure @ 25°C, atm
Diethyl ether $(C_2H_5)_2O$	0.7
Bromine (Br_2)	0.3
Ethyl alcohol (C_2H_5OH)	0.08
Water (H_2O)	0.03

   a. water
   b. bromine
   c. ethyl alcohol
   d. diethyl ether

9. Based on the LEDS below, which has a lower boiling point and what accounts for the difference based on the intermolecular forces present in each species?



Diethyl ether



Ethyl alcohol

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a. Ethyl alcohol has a lower boiling point due to the dispersion forces present among the molecules.
b. Ethyl alcohol has a higher boiling point because of the predominant H-bonding present among the molecules.
c. Diethyl ether has a lower boiling point due to dipole-dipole interaction.
d. Diethyl ether has a higher boiling point because it is capable of forming H-bond.

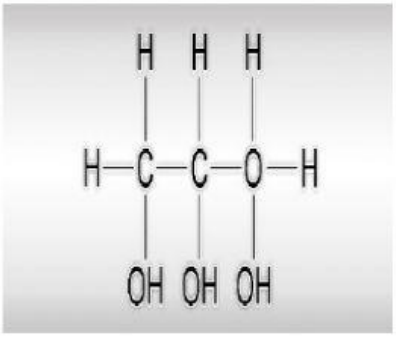
10. The atmospheric pressure on top of a mountain is lower than at sea level. As a consequence, what will happen to the cooking time of an egg on top of the mountain?
    a. The egg will cook faster since the boiling temperature will be lower.
    b. The egg will cook at a shorter time since the boiling temperature will be higher.
    c. The egg will cook at a longer time due to a lower boiling temperature.
    d. The egg will cook at a shorter time due to higher boiling temperature.

11. Sodium chloride is completely soluble in water. What is responsible for its solubility in water?
    a. Na^+ and Cl^- ions are favorable sites for H-bonding to form.
    b. The ions in NaCl participate in ion-induced dipole attractions with water.
    c. The presence of charged ends in NaCl enables ion-dipole interaction with water.
    d. London dispersion forces in NaCl predominate leading to strong dipole interactions with water.

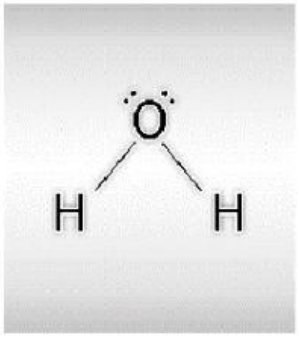
12. Xenon has a greater atomic weight than neon. Xe has 131.3 amu while Ne has 20.2 amu. The boiling points are 166.1K and 27.3K, respectively. How do intermolecular forces account for the difference?
    a. Dipole- dipole interaction is greater in Xe than Ne so more energy is needed to break the bonds.
    b. H-bonding is greater for substances with higher atomic weight so greater energy is needed to change Xe to vapour.
    c. Atomic weight increases the chance of lesser dispersion forces so greater energy is needed to separate Xe atoms to change to vapour
    d. London dispersion forces are greater in substances with heavier atomic weight so greater energy is needed to separate the atoms of Xe than Ne.

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13. Which is more viscous between glycerol and water based on their LEDS and intermolecular forces?



Glycerol



Water

a. Glycerol because it has more OH^- groups that form London dispersion forces among the molecules.
b. Glycerol because it has more OH^- groups that form H-bonding among the molecules.
c. Glycerol because it has less OH^- groups that form London dispersion forces among the molecules.
d. Glycerol because it has less OH^- groups that form H-bonding forces among the molecules.

14. Cohesive forces bring about capillary action. What do these forces do to molecules?
a. They pull molecules towards gravity.
b. They draw the same kind of molecules together.
c. They trigger interactions among polar molecules.
d. They hasten attractions among different molecules.

15. What is expected of the boiling point when intermolecular forces are high? It will be
a. dependent on the kinds of atoms.
b. dependent on the number of atoms.
c. high.
d. low.

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