HW12 - Solids and Liquids

1 1 point

Which of the following statements regarding intermolecular forces (IMF) is/are true?
1. IMF result from attractive forces between regions of positive and negative charge density in neighboring molecules.
2. The stronger the bonds within a molecule are, the stronger the intermolecular forces will be.
3. Only non-polar molecules have instantaneous dipoles.

- 2 and 3
- 3 only
- 1, 2, and 3
- 1 and 2
- 2 only
- 1 only
- 1 and 3

2 1 point

Put the following compounds in order of increasing melting points.
LiF, HF, F_2, NF_3

- LiF, HF, NF_3, F_2
- LiF, HF, F_2, NF_3
- F_2, NF_3, HF, LiF
- F_2, NF_3, LiF, HF

3 1 point

What type of intermolecular forces would you expect to find in a pure liquid sample of carbon tetrachloride?

- interionic (ionic)
- hydrogen bonding
- dipole-dipole
- London

4 1 point

A drop of liquid tends to have a spherical shape due to the property of...

- surface tension.
- close packing.
- viscosity.
- capillary action.
- vapor pressure.

5 1 point

Surface tension describes...

- the forces of attraction between the surface of a liquid and the air above it.
- the resistance to flow of a liquid.
- the forces of attraction between surface molecules of a solvent and the solute molecules.
- capillary action.
- the inward forces that must be overcome in order to expand the surface area of a liquid.
- adhesive forces between molecules.

6 1 point

Predict which of butane (C_4H_{10}) or propanone (CH_3COCH_3) has the greater viscosity. Assume that they are both at the same temperature and in their liquid form.

- propanone
- It's impossible to know.
- butane
- They have equal viscosities.

7 1 point

Which would you expect to be the most viscous?

- C_4H_8 at 30°C
- C_8H_{18} at 50°C
- C_4H_8 at 50°C
- C_8H_{18} at 30°C

8 1 point

The vapor pressure of all liquids...

- decreases if the volume of the container increases.
- is the same at their freezing points.
- is the same at 100°C.
- increases with temperature.

9 1 point

Based on the general concepts that govern intermolecular attractions, which of the following orderings of fluorocarbons is correct when going from highest to lowest boiling point?
1. CF_4
2. $F_3C\text{-}(CF_2)_4\text{-}CF_3$
3. $F_3C\text{-}(CF_2)_2\text{-}CF_3$

- 1, 3, 2
- 1, 2, 3
- 3, 2, 1
- 3, 1, 2
- 2, 3, 1
- 2, 1, 3

10 1 point

Tetrabromomethane has a higher boiling point than tetrachloromethane.

- It's impossible to know.
- True
- False

11 1 point

Which of KBr or CH_3Br is likely to have the higher normal boiling point?

- They will have the same boiling point.
- KBr
- CH_3Br
- It is impossible to tell.

12 1 point

Which of the following would you expect to boil at the lowest temperature?

- C_8H_{18}
- KF
- PCl_3
- C_3H_6
- CH_4

13 1 point

A liquid with a high vapor pressure is called...

- viscous.
- volatile.
- hot.
- cold.

14 1 point

Which would you expect to have the highest vapor pressure at a given temperature?

- SBr_4
- C_5H_{12}
- NaCl
- C_2H_6

15 1 point

Rank the following in order of increasing vapor pressure at a fixed temperature: H_2O, CH_3Cl, He, NaCl

- $H_2O < NaCl < CH_3Cl < He$
- $He < CH_3Cl < H_2O < NaCl$
- $He < H_2O < CH_3Cl < NaCl$
- $H_2O < CH_3Cl < He < NaCl$
- $NaCl < H_2O < CH_3Cl < He$

16 1 point

Which of the following solids is a covalent network?

- $H_2O(s)$
- $CaCO_3(s)$
- $SiO_2(s)$
- Ni(s)

17 1 point

Which of the following, in the solid state, would be an example of a covalent crystal?

- iron
- carbon dioxide
- barium fluoride
- water
- diamond

18 1 point

Diamond and graphite are two crystalline forms of carbon. In which form are the C atoms arranged in flat sheets with one C bonded to three nearby C atoms?

- diamond
- graphite
- neither of these

19 1 point

Which of the following, in the solid state, would be an example of a molecular crystal?

- carbon dioxide
- iron
- calcium fluroide
- diamond

20 1 point

Which of the following, in the solid state, would be an example of an ionic crystal?

- copper
- carbon dioxide
- diamond
- sodium nitrate

21 1 point

Metallic solids are solids composed of metal atoms that are held together by metallic bonds. They also tend to be good conductors because...

- the electrons in metallic solids are delocalized.
- the electrons in metallic solids are tightly bound allowing other electrons to flow freely.
- metals are malleable and can be pounded into sheets.
- metals are ductile and can be pulled into wires.