**Quiz 10A**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Calculate the amount of water in grams that can be vaporized at its boiling point with 312 kJ of heat (for water ∆Hvap = 40.7 kJ/mol, ∆Hfus = 6.02 kJ/mol, cwater = 4.184 J/g °C) (6 points).

$$q=m∆H\_{vap}⇒m=\frac{q}{∆H\_{vap}}=312 kJ×\frac{1 mol H\_{2}O }{40. 7 kJ}×\frac{18.015 g H\_{2}O}{1 mol H\_{2}O}=138 g H\_{2}O$$

1. Do the following statements describe the compound Ag2CO3? Answer yes or no (4 points).

|  |  |  |
| --- | --- | --- |
|  | The compound would be expected to be a solid at room temperature and pressure.  | yes |
|  | The compound is ionic. | yes |
|  | If the compound dissolved in water it would be a non-electrolyte. | no |
|  | The compound would be expected to have a relatively low melting point.  | no |

1. Are the following statements true or false (5 points)?

|  |  |  |
| --- | --- | --- |
|  | A substance with a relatively low surface tension usually has a very low boiling point. | True |
|  | All other things being equal, hydrogen bonds are stronger than induced dipole or dipole forces.  | True |
|  | If you break (shatter) an amorphous solid, it will break in straight lines, but if you break a crystalline solid, it will break in curved lines.  | False |
|  | Ionic crystals are generally soluble in water. | True |
|  | The numerical value of heat of vaporization is always larger than the numerical value of heat of fusion.  | True |

1. A solution is prepared with 22.0 g NaOHand 118.0 g water. It has a density of 1.15 g/mL and a total volume of solution of 0.1217 L (5 points).
	1. What is the mass percent of the NaOH solution?

$mass\%=\frac{m\_{solute}}{m\_{solution}}×100\%=\frac{22.0 g NaOH}{22.0 g+118.0 g}×100\%=\frac{22.0 g }{140.0 g}×100\%=15.7\% NaOH$