**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. What kinds of intermolecular forces are present in each substance (5 points)?
	1. NH3 (trigonal pyramidal) \_\_London-dispersion, dipole forces, and hydrogen bonds
	2. NCl3 (trigonal pyramidal) \_\_\_London-dispersion, dipole forces
2. Determine the amount of sucrose in 48.0 g of a solution containing 3.71% sucrose by mass (4 points).

$$48.0 g soln×\frac{3.71 g sucrose}{100 g soln}=1.7808 g sucrose≈1.78 g sucrose$$

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) (5 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. Are the following statements true or false (6 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 |
|  | Iron is a molecular solid.  | False  |