**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 ice in grams that, upon melting (at 0°C), absorbs 114 kJ of heat (for water ∆Hvap = 40.7 kJ/mol, ∆Hfus = 6.02 kJ/mol, cwater = 4.184 J/g °C) (6 points).

$$q=m∆H\_{fus}⇒m=\frac{q}{∆H\_{fus}}=114 kJ×\frac{1 mol H\_{2}O }{6.02 kJ}×\frac{18.015 g H\_{2}O}{1 mol H\_{2}O}=341 g H\_{2}O$$

1. For each pair of solids, determine which solid has the higher melting point and explain why (4 points).
	1. Ne (s) and Xe (s)

Xe (s); xenon has a higher molar mass and thus more London dispersion forces.

* 1. NaCl (s) and CH4 (s)

NaCl (s); NaCl (s) is an ionic solid, and CH4 (s) is a molecular solid.

1. Calculate the molarity of 315 g C12H22O11 in 0.238 L of solution (5 points).

$$M=\frac{n\_{solute}}{L\_{solution}}=\frac{315 g C\_{12}H\_{22}O\_{11}}{0.238 L}×\frac{1 mol C\_{12}H\_{22}O\_{11}}{342.297 g C\_{12}H\_{22}O\_{11}}=3.87 M C\_{12}H\_{22}O\_{11}$$

1. Determine the concentration of Cl- in 0.15 M AlCl3 (4 points).

$$\frac{0.15 mol AlCl\_{3}}{1 L}×\frac{3 mol Cl^{-}}{1 mol AlCl\_{3}}=0.45 M Cl^{-}$$

1. An \_\_indicator\_\_\_\_ is a substance that changes color when a solution changes from acidic to basic (1 point).

**Quiz 10B**

# 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. A \_\_buret\_\_\_\_ is a hollow, graduated cylindrical tube equipped with a regulating device for controlling the flow of a liquid (1 point).
2. Calculate the amount of water in grams that can be vaporized at its boiling point with 257 kJ of heat (for water ∆Hvap = 40.7 kJ/mol, ∆Hfus = 6.02 kJ/mol, cwater = 4.184 J/g °C) (6 points).

$$q=m∆H\_{vap}⇒m=\frac{q}{∆H\_{vap}}=257 kJ×\frac{1 mol H\_{2}O }{40. 7 kJ}×\frac{18.015 g H\_{2}O}{1 mol H\_{2}O}=114 g H\_{2}O$$

1. For each pair of solids, determine which solid has the higher melting point and explain why (4 points).
	1. H2O (s) and H2S (s)

H2O (s); while both are molecular solids, water has strong hydrogen bonding.

* 1. Kr (s) and Xe (s)

Xe (s); xenon has a higher molar mass and thus more London dispersion forces.

1. Calculate the molarity of 22.6 g C12H22O11 in 0.442 L of solution (5 points).

$$M=\frac{n\_{solute}}{L\_{solution}}=\frac{22.6 g C\_{12}H\_{22}O\_{11}}{0.442 L}×\frac{1 mol C\_{12}H\_{22}O\_{11}}{342.297 g C\_{12}H\_{22}O\_{11}}=0.149 M C\_{12}H\_{22}O\_{11}$$

1. Determine the concentration of Cl- in 0.15 M CuCl2 (4 points).

$$\frac{0.15 mol CuCl\_{2}}{1 L}×\frac{2 mol Cl^{-}}{1 mol AlCu}=0.30 M Cl^{-}$$