**Chapter 15 Solutions Worksheet** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Honors Chemistry

**mass percent** = $\frac{mass solute}{mass solution} x 100$ **molarity(M)** = $\frac{moles solute}{L solution}$ **dilution** M1 x V1 = M2 x V2

**molality(*m*)** = $\frac{moles solute}{kg solvent}$ **ΔTb** = *i* x *Kb* x *m* **ΔTf** = *i* x *Kf* x *m*

 for water: *Kb* = .512°C/*m* and *Kf* = 1.86°C/*m*

1. A 151 g portion of a sodium chloride solution is evaporated, producing 5.35 g of dry solid

 NaCl. Calculate the percentage of NaCl in the original solution.

2. How many grams of KBr are contained in 125 g of 6.25% (by mass) KBr solution?

3. Calculate the molarity of the solution prepared when 2.50 mol of Pb(NO3)2 is dissolved in

 enough water to make 20.0 L of solution.

4. Calculate the molarity of a solution composed of 103 g of Al2(SO4)3 dissolved in 7.00 x 102

 mL of solution.

5. A solution of NaNO3 has a molarity of .830 M. If 212.5 g of sodium nitrate is dissolved in

 the solution, what is the volume in mL and L?

6. Calculate the new molarity if the following dilution is made. Assume the volumes are

 additive. 25.0 mL of water is added to 10.0 mL of .251 M CaCl2 solution.

7. Describe how to prepare 90. mL of a 2.0 M H2SO4 solution from an 18 M stock solution. (A

 stock solution is a solution with a known concentration already on hand in the stock room.)

8. Suppose 325 mL of .150 M NaOH is needed for your experiment. How would you prepare

 this if all that is available is a 1.01 M NaOH solution?

9. Calculate the molality of a solution prepared by dissolving 6.33 moles of KCN in 633 g of

 water.

10. Calculate the molality of a solution containing 6.00 g of sodium hydroxide dissolved in 325

 g of water.

11. At what temperature will a 3.0 m aqueous solution of sodium fluoride freeze? (Remember:

 how many particles does the solute break into when dissolved, *i* ?)

12. Calculate the boiling point elevation, ΔTb, for a solution which contains .325 mol of calcium

 phosphate, Ca3(PO4)2 , dissolved into 240.0 g of water.

13. Calculate **both** the **freezing point** and **boiling point** of a solution containing 2.65 moles of

 methanol, CH3OH, in 622 g of water.

14. The boiling point for water was raised 2.30°C when 12.0 grams of a nonvolatile (a

 substance that does not readily vaporize) solute was dissolved in 650. grams of water.

 Calculate the molecular mass, mm, of the non-dissociating solute.