WS 18.0 *Name:_____p.____*

1. ***Definitions:*** **Compound:** Two or more elements, chemically bonded together in specific proportions.

Mixture: Two or more elements and/or compounds that are mixed together, but not chemically bonded.
* for example, a mixture could contain 2 elements, or 2 compounds, or 2 elements and 1 compound, or 5 compounds and two elements, or ……

Homogeneous mixture: A mixture that is well mixed, and uniform throughout.
Heterogeneous mixture: A mixture that is NOT well mixed; it is NOT uniform throughout.

Solution:_____

Solute:_____

Solvent:_____

If two liquids dissolve together, or if two gases dissolve together,
the _____ will be the substance present in the larger amount, and
the _____ will be the substance present in the smaller amount.

If the solution contains a solid dissolved into a liquid, or a gas dissolved into a liquid, the
the solid/gas will be the _____ and the liquid will be the _____, regardless of the relative amounts.

A **Concentrated** solution has a relatively _____ amount of solute present per volume of solution.

A **Dilute** solution has a relatively _____ amount of solute present per volume of solution.

2. Identify the solute and the solvent in each of these:	solute	solvent
a. 10 grams of sugar dissolved into 100 mL of water	_____	_____
b. a mixture created by mixing 50 mL ethyl alcohol with 20 mL of water	_____	_____
c. $CaCl_{2(aq)}$	_____	_____
d. 10 mL vegetable oil dissolved into 80 mL of liquid hexane	_____	_____
e. Sweat	_____	_____
f. 100 grams of sugar dissolved into 50 grams of water.	_____	_____

3. Molarity =

4. A solution was made by dissolving 11.2 grams of sodium nitrate into 150. mL of water. The total volume of the solution after mixing/dissolving was 153.8 mL. Determine the molarity of $NaNO_3$ in this solution.

5a. What is the formula for magnesium nitrate?_____.
b. Magnesium nitrate is highly soluble into water. At room temperature, 69.5 grams of magnesium nitrate can dissolve per 100. grams of water, to create a solution with a total volume of 137 mL. (This is called a "saturated" solution since it contains as much solute as possible.) Calculate the molarity of magnesium nitrate in this solution.

5c. Another solution contains 0.57 moles of magnesium nitrate dissolve into enough water to make 200. mL of solution. What is the concentration (molarity) of this solution?

d. Which solution was more concentrated: The solution in (b) or the solution in (c)?_____
Which solution was more dilute: The solution in (b) or the solution in (c)?_____

6. If 85.7 grams of sodium chloride are dissolved per 400.0 mL solution, what is the molarity of NaCl?

7. If 2.8 moles of lithium dichromate are dissolved into water, so that the total solution volume is 480 mL, calculate the molarity of $Li_2Cr_2O_7$ in this solution.

8. What mass of potassium chloride (KCl) must be dissolved, in order to make 300. mL of 0.20 M solution?

9. What mass of potassium hydroxide (KOH) must be dissolved, in order to make 2.000 liters of 5.00 Molar KOH solution?

10a. What is the formula for sodium carbonate?_____
b. What is the molarity of a solution with a volume of 750. mL, if it contains 150. grams of sodium carbonate?

11. The most concentrated sulfuric acid (H_2SO_4) we can buy is 98% sulfuric acid and 2% water. A 50.0 mL sample of this solution contains 0.920 moles of H_2SO_4. Calculate the molarity of sulfuric acid in this solution.

12. The most concentrated hydrochloric acid (HCl) solution we can buy is 12.1 Molar. Calculate the moles of HCl that are present in 175 mL of this solution.