Chemistry.Unit VII. Solutions Worksheet   **Show all your work**.

1. Calculate the mass percentage of $CaCl_2$ in a solution containing 16.5 g of $CaCl_2$ in 456 g of water.

2. An ore of silver contains 83.5 g of Ag per ton of ore. What is the concentration of silver in ppm?

3. What is the mass percentage of iodine, I_2, in a solution containing 0.065 mol I_2 in 120g of CCl_4?

4. Calculate the mole fraction of methyl alcohol in a solution that contains 8.5 g of CH_3OH in 224 g of H_2O.

5. Calculate the molarity of a solution containing 10.5 g of NaCl in 359.0 mL of solution.

6. How many grams of H_2SO_4 is dissolved in 2.00L of 18.5 M $H_2SO_{4(aq)}$?

7. Find the molality of 46.85 g of codeine, $C_{18}H_{21}NO_3$, in 125.5 g of ethanol, C_2H_5OH

8. A 13.0% K_2CO_3 by mass has a density of 1.09 g/cm^3. Calculate the molarity of the solution

9. Describe how you would prepare 425 mL of 0.100 M $C_6H_{12}O_6$ starting with 2.00 L of a 1.50 M solution.

10. What volume of 0.600 M HCl is required to react completely with 2.50 g of sodium bicarbonate?
    $NaHCO_3$ + HCl → NaCl + CO_2 + H_2O

11. Ethylene Glycol ($C_2H_6O_2$), a non-ionizable solute, is added to water to produce automotive antifreeze. Calculate the boiling point and freezing points, at standard pressure, of a 25.0 mass percent solution ethylene glycol in water.

12. How many liters of HCl gas, measured at 30.0°C and 745 torr, are required to prepare 2.50 L of a 1.60 M solution of Hydrochloric acid?

Answers
1. 3.49%   2. 91.9ppm   3. 12%   4. 0.021   5. 0.500 M   6. 3630 g   7. 1.247 m   8. 1.03 M
9. 28.3 mL of 1.5M & 396.7 mL of H_2O 10. 49.6 mL   11. 102.8 oC & –9.99oC   12. 102 L