**Concentration Worksheet 2**

**Concentration in Percentage**

* Frequently used with commercial products.

 **Concentration (%) = amount of solute x 100**

 **amount of solution**

**1.** **Percent by mass:**

 **= mass of solute in g x 100**

 **mass of solution in g**

What is the percent-by-mass, **%(m/m),** concentration of sucrose in a solution made by dissolving 7.6 g of sucrose in 83.4 g of water?**(8.4%)**

**2. Percent by volume:**

 **= volume of solute in mL x 100**

 **volume of solution in mL**

Calculate the volume percent, **%(v/v),** of a solute in the following solution: 20.0 mL of methyl alcohol in enough water to give 475 mL of solution. **(4.21%)**

**3. Mass to volume percent**:

 **= volume of solute in mL x 100**

 **mass of solution in g**

 Normal saline solution that is used to dissolve drugs for intravenous use is 0.92 % (m/v) NaCl in water. How many grams of NaCl are required to prepare 35.0 mL of normal saline solution?**(0.32 g)**

**Parts per million (ppm):** Used with very dilute solutions

**Problems**

1. What is the concentration, in ppm, of a solution made with 18.5 g of salt in 125 000 g of water? (Hint: calculate the total mass of the solution first) *(answer: 148 ppm)*
2. What is the concentration, in ppm, if the solubility of NaCl at 25˚C is 36.2 g/100 g solution? *(answer: 3.62 x 105 ppm)*
3. What mass of NaCl can be dissolved in 50.0 g of H2O at the same concentration as the last problem? *(answer: 18.1 g)*