CW1: Worksheet on molarity, molality, and dilution

NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PERIOD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show your calculations for credit.

**Molarity calculations:**

1.      Determine the molarity of these solutions

a.      4.67 moles of Li2SO3 dissolved to make 2.04 liters of solution.

b.      0.629 moles of Al2O3 to make 1.500 liters of solution

c.      4.783 grams of Na2CO3 to make 10.00 liters of solution

2.      Determine the number of moles of solute to prepare these solutions:

a.      2.35 liters of a 2.00 M Cu(NO3)2 solution

b.      16.00 mL of a 0.415 M Pb(NO3)2 solution

c.      3.00 L of a 0.500 M MgCO3 solution

3.      Determine the grams of solute to prepare these solutions:

a.      0.289 liters of a 0.00300 M Cu(NO3)2 solution

b.      16.00 milliliters of a 5.90 M Pb(NO3)2 solution

c.      508 mL of a 2.75 M NaF solution

**Molality calculations:**

1.      Determine the molality of the following solutions:

a.      2.85 g of Li2SO3 in 1.8 kg of solvent

b.      0.629 g of Al2O3 in 3.100 kg of solvent

c.      4.783 grams of Na2CO3 in 0.500 kg of solvent

2.      Determine the moles of solute to prepare these solutions:

a.      2.00 *m* Cu(NO3)2 with 25.00 kg of solvent

b.      0.415 *m* Pb(NO3)2 with 4.15 kg of solvent

c.      3.58 *m* Na2O with 0.250 kg of solvent

3.      Determine the grams of solute to prepare these solutions:

a.      1.50 *m* MgCO3 solution with 2.8 kg of solvent

b.      17.2 *m* NH3 solution with 14.0 kg of solvent

c.      12.0 *m* HCl solution with 1.00 kg of solvent

**Dilution calculations:**

1.      A stock solution of 1.00 M NaCl is available. How many milliliters are needed to make 100.0 mL of 0.750 M

2.      What volume of 0.250 M KCl is needed to make 100.0 mL of 0.100 M solution?

3.      Concentrated H2SO4 is 18.0 M. What volume is needed to make 2.00 L of 1.00 M solution?

4.      Concentrated HCl is 12.0 M. What volume is needed to make 2.00 L of 1.00 M solution?

5.      A 0.500 M solution is to be diluted to 500.0 mL of a 0.150 M solution. How many mL of the 0.500 M solution are required?