**Quiz 3**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. A solution is prepared by dissolving 5.00 g of barium chloride in 250.00 mL of water (10 points).
	1. What is the molarity of the solution?

$$\frac{5.00 g BaCl\_{2}}{250.00 mL}×\frac{1 mol BaCl\_{2}}{208.233 g BaCl\_{2}}×\frac{1000 mL}{1 L}=0.0960 M BaCl\_{2}$$

* 1. What is the molarity of each ion in the solution?

$$\frac{0.0960 mol BaCl\_{2}}{1 L soln}×\frac{1 mol Ba^{2+}}{1 mol BaCl\_{2}}=0.0960 M Ba^{2+}$$

$$\frac{0.0960 mol BaCl\_{2}}{1 L soln}×\frac{2 mol Cl^{-}}{1 mol BaCl\_{2}}=0.192 M Cl^{-}$$

* 1. If 15.00 mL of this solution is diluted to 50.00 mL what is the molarity of the resulting solution?

$$M\_{1}V\_{1}=M\_{2}V\_{2}⇒M\_{2}=M\_{1}\frac{V\_{1}}{V\_{2}}=\left(0.0960 M\right)\left(\frac{15.00 mL}{50.00 mL}\right)=0.0288 M BaCl\_{2} $$

1. Write the equation for Beer’s Law. Be sure to define your variables (5 points).

$A=ϵbc$, where A = absorbance, $ϵ$ = molar absorptivity, b = path length, c = concentration

1. How do we decide which component of a solution is the solvent (3 points)?

The solvent is usually the liquid component of the solution. If both the solvent and solute are liquids or solids, the solvent is that component present in greatest amount (volume).

1. Define oxidation state (2 points).

The oxidation state is the imaginary charge an atom would have if shared electrons were divided equally between identical atoms bound to one another, or, for different atoms, if electrons were all assigned to the atom in each bond that has the greater attraction for electrons.