General Chemistry
Mr. MacGillivray
Quiz #31:
Molarity & Dilution

Solve the following problems. Show all work.

1. Another name for a homogeneous mixture is a(n) solution.
2. A solution of two metals is called a(n) alloy.
3. A solution in which alcohol is the solvent is called a(n) tincture.
4. A solution in which water is the solvent is called a(n) aqueous solution.
5. Determine the concentration of a solution in which 1.50 mol of $BaCl_2$ is dissolved in enough water to make 12.0 L of solution.

$$M = \frac{1.50\ mol}{12.0\ L} = 0.125\ M$$

6. Determine the concentration of a solution in which 1.50 g of $BaCl_2$ is dissolved in enough water to make 12.0 L of solution.

$$137.3 + 2 \times 35.45 = 208.2$$

$$1.50\ g \times \frac{1\ mol}{208.2\ g} = 0.00720\ mol$$

$$M = \frac{0.00720\ mol}{12.0\ L} = 0.000600 = 6.00 \times 10^{-4}\ M$$

7. A chemistry student needs 50.0 ml (V_2) of 0.035 M (M_2) $BaCl_2$ (aq) in order to carry out a lab experiment. However, the only solution available in the lab is 0.100 M (M_1) $BaCl_2$ (aq). Explain how she would make the dilute solution that is needed for her experiment. Show calcs clearly and use one sentence.

$$M_1V_1 = M_2V_2$$

$$V_1 = \frac{M_2V_2}{M_1} = \frac{(0.035)(50)}{0.1} = 17.5\ ml$$

Deliver 17.5 ml to a 50 ml volumetric flask. Add water up to the 50.0-ml mark. Invert 10 to 20 times to mix thoroughly.