Quiz
Chemistry 121 **Name** Key

1. Determine the molar mass to the nearest 100th place (two places past the decimal point) for the following compounds:

   a. $(NH_4)_3PO_4$ ammonium phosphate 149.12 g/mol

   3 x 14.01
   12 x 1.01
   1 x 30.97
   4 x 16.00
   149.12

   b. $(CH_3)_2CHOH$ (isopropyl alcohol / rubbing alcohol) 60.11 g/mol

   3 x 12.01
   8 x 1.01
   1 x 16.00
   60.11

2. Find the percentage:

   a. **Iron** in iron (III) sulfate $Fe_2(SO_4)_3$ 27.93%

   2 x 55.84 → 111.68
   3 x 32.07
   12 x 16.00
   399.89

   b. **Copper** in copper (II) nitrate $Cu(NO_3)_2$ 33.88%

   Cu 63.55
   28.02
   96.00
   187.57

3. Carry out the following conversions:

   a. 63.9 g NaCl is how many moles? $63.9 \times \frac{1 mol}{58.44} = 1.09 mol NaCl$

   b. 5.4 moles of $Ba(OH)_2$ is how many grams? $5.4 mol \times \frac{171.35 g}{mol} = 925.29 g$

   137.33
   32.00
   2.02
   171.35

4. If one mole contains 6.022×10^{23} objects – how many atoms of oxygen are in 4.0 moles of oxygen gas? (note: oxygen is a diatomic molecule).

   $6.022 \times 10^{23} \times 4.0 \times 2 = 48. \times 10^{23} = 4.8 \times 10^{24}$ atoms O

5. Given the following percentage composition – find the empirical formula:

   38.9% Ba
   29.4% Cr
   31.7% O

   $38.9 g Ba \times \frac{1 mol}{137.33} = 0.28326 / .28326 = 1$

   $29.4 g Cr \frac{1 mol}{52.00} = 0.56538 / .28326 = 2$

   $31.7 g O \frac{1 mol}{16.00} = 1.98125 / .28326 = 7$

   $BaCr_2O_7$