

Answer Key

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Nomenclature Worksheet

1. Using the periodic table as a guide, predict the chemical formula and name of the compound formed by the following elements:

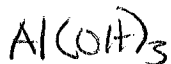
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|-----------------------|-------------------|----------------------|----------------|
| a. Ga and F | GaF_3 | b. Li and H | LiH |
| Gallium Fluoride | | Lithium hydride | |
| c. Al and I | AlI_3 | d. K and S | K_2S |
| Aluminum Iodide | | Potassium sulfide | |
| e. Ca and Br | $CaBr_2$ | f. K and CO_3 | K_2CO_3 |
| Calcium Bromide | | Potassium carbonate | |
| g. Al and $C_2H_3O_2$ | $Al(C_2H_3O_2)_3$ | h. NH_4 and SO_4 | $(NH_4)_2SO_4$ |
| Aluminum Acetate | | Ammonium sulfate | |
| i. Mg and PO_4 | $Mg_3(PO_4)_2$ | | |
| Magnesium Phosphate | | | |

2. Name the following compounds

- | | |
|----------------------|---------------------------|
| a. $LiNO_3$ | b. Sc_2O_3 |
| Lithium Nitrate | Scandium Oxide |
| c. $CsBr$ | d. NF_3 |
| Cesium Bromide | Nitrogen trifluoride |
| e. Ag_2SO_4 | f. PF_5 |
| Silver(I) Sulfate | Phosphorous pentafluoride |
| g. NaI | h. SCl_2 |
| Sodium Iodide | Sulfur dichloride |
| i. $Ca(NO_3)_2$ | j. $FeCl_3$ |
| Calcium Nitrate | Iron(III) Chloride |
| k. $CoCO_3$ | l. N_2O_4 |
| Cobalt(II) Carbonate | dinitrogen tetroxide |

3. Write the chemical formulas for the following compounds

a. aluminum hydroxide



c. copper (I) oxide



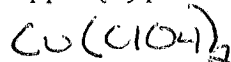
e. mercury (II) bromide



g. sodium phosphate



i. copper (II) perchlorate



k. chromium (III) acetate



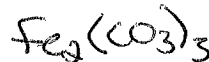
b. potassium sulfate



d. zinc nitrate



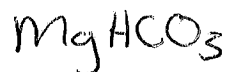
f. iron (III) carbonate



h. cobalt (II) nitrate



j. magnesium hydrogen carbonate



4. Calculate the following quantities

a. mass, in grams, of 0.773 mol of CaH_2

$$\frac{0.773 \text{ mol } \text{CaH}_2}{1 \text{ mol}} \times \frac{42.0958 \text{ g}}{1 \text{ mol}} = 32.5 \text{ g } \text{CaH}_2$$

b. moles of $\text{Mg}(\text{NO}_3)_2$ in 5.35 g of this substance

$$\frac{5.35 \text{ g } \text{Mg}(\text{NO}_3)_2}{148.3148 \text{ g/mol}} = 0.0361 \text{ mol } \text{Mg}(\text{NO}_3)_2$$

c. number of molecules in 0.0305 mol CH_3OH

$$\frac{0.0305 \text{ mol } \text{CH}_3\text{OH}}{1 \text{ mol}} \times \frac{6.022 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = 1.84 \times 10^{22} \text{ molecules } \text{CH}_3\text{OH}$$

d. number of C atoms in 0.585 mol C_4H_{10}

$$\frac{0.585 \text{ mol } \text{C}_4\text{H}_{10}}{1 \text{ mol } \text{C}_4\text{H}_{10}} \times \frac{4 \text{ mol C}}{1 \text{ mol } \text{C}_4\text{H}_{10}} \times \frac{6.022 \times 10^{23} \text{ atoms}}{1 \text{ mol}} = 1.41 \times 10^{24} \text{ atoms C}$$

e. Mass in grams, of 1.906×10^{-2} mol BaI_2

$$\frac{1.906 \times 10^{-2} \text{ mol } \text{BaI}_2}{1 \text{ mol } \text{BaI}_2} \times \frac{391.139 \text{ g}}{1 \text{ mol } \text{BaI}_2} = 7.455 \text{ g } \text{BaI}_2$$

f. number of moles of NH_4Cl in 48.3 g of this substance

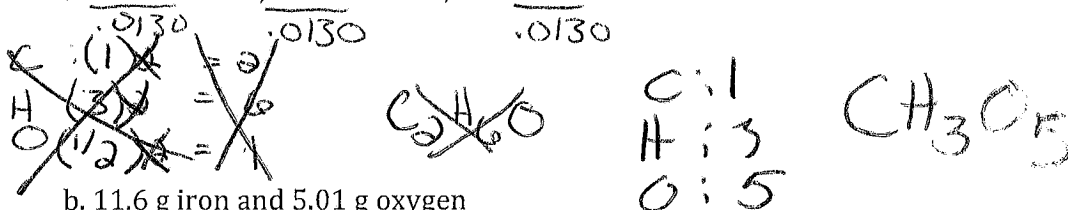
$$\frac{48.3 \text{ g}}{53.4913 \text{ g/mol}} = 0.903 \text{ mol } \text{NH}_4\text{Cl}$$

g. number of molecules of 0.05752 mol HCHO_2

$$\frac{0.05752 \text{ mol HCHO}_2}{1 \text{ mol}} \times \frac{6.022 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = 3.464 \times 10^{22} \text{ molecules}$$

5. Give the empirical formula of each of the following compounds if a sample contains

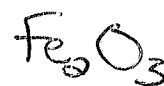
a. 0.0130 mol C, 0.0390 mol H, and 0.065 mol O



b. 11.6 g iron and 5.01 g oxygen

$$\text{Fe: } \frac{11.6 \text{ g Fe}}{55.847 \text{ g/mol}} = 0.208 \text{ mol Fe} = (1)2 = 2$$

$$\text{O: } \frac{5.01 \text{ g O}}{15.9994 \text{ g/mol}} = 0.313 \text{ mol O} = (1.5)2 = 3$$



c. 40.0% C, 6.7% H, and 53.3% O by mass

$$\text{C: } \frac{40.0 \text{ g C}}{12.011 \text{ g/mol}} = 3.33 \text{ mol C} = 1$$

$$\text{H: } \frac{6.7 \text{ g H}}{1.0079 \text{ g/mol}} = 6.65 \text{ mol H} = 2$$

$$\text{O: } \frac{53.3 \text{ g O}}{15.9994 \text{ g/mol}} = 3.33 \text{ mol O} = 1$$

