

Percent Composition II

Name Key-Mr. Smully Period _____

Answer the following questions related to the gram formula mass and the percent composition of the element in the compounds.

1. Calculate the percent composition of K_2O . (Show the % O and the %K.)

$$\%K = \frac{78}{94} \times 100 = 83\%$$

$$\%O = \frac{16}{94} \times 100 = 17\%$$

$$\begin{array}{r} \text{GFM} \\ K = 2 \times 39 = 78 \\ O = 1 \times 16 = 16 \\ \hline 94 \text{ g/mol} \end{array}$$

2. Find the percent composition of Sr_3P_2 . (Show the % Sr and the %P.)

$$\%Sr = \frac{264}{326} \times 100 = 81\%$$

$$\%P = \frac{62}{326} \times 100 = 19\%$$

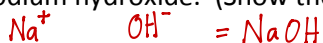
$$\begin{array}{r} \text{GFM} \\ Sr = 3 \times 88 = 264 \\ P = 2 \times 31 = 62 \\ \hline 326 \text{ g/mol} \end{array}$$

3. Find the percent composition of sodium hydroxide. (Show the % Na, %O and the %H.) (Write the formula first.)

$$\%Na = \frac{23}{40} \times 100 = 57.5\%$$

$$\%O = \frac{16}{40} \times 100 = 40\%$$

$$\%H = \frac{1}{40} \times 100 = 2.5\%$$



$$\begin{array}{r} \text{GFM} \\ Na = 1 \times 23 = 23 \\ O = 1 \times 16 = 16 \\ H = 1 \times 1 = 1 \\ \hline 40 \text{ g/mol} \end{array}$$

4. Find the percent composition of glucose, $C_6H_{12}O_6$. (Show the % C, %H and the %O.)

$$\%C = \frac{72}{178} \times 100 = 39.3\%$$

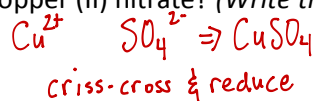
$$\%H = \frac{12}{178} \times 100 = 6.7\%$$

$$\%O = \frac{96}{178} \times 100 = 53.9\%$$

$$\begin{array}{r} \text{GFM} \\ C = 6 \times 12 = 72 \\ H = 12 \times 1 = 12 \\ O = 6 \times 16 = 96 \\ \hline 178 \text{ g/mol} \end{array}$$

5. What is the percentage of copper in a compound called copper (II) nitrate? (Write the formula first.)

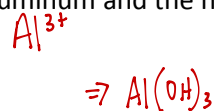
$$\%Cu = \frac{64}{160} \times 100 = 40\%$$



$$\begin{array}{r} \text{GFM} \\ Cu = 1 \times 64 = 64 \\ S = 1 \times 32 = 32 \\ O = 4 \times 16 = 64 \\ \hline 160 \text{ g/mol} \end{array}$$

6. Determine the percentage of hydrogen in a compound composed of aluminum and the hydroxide ion. (Write the formula first.)

$$\%H = \frac{3}{78} \times 100 = 3.8\%$$



$$\begin{array}{r} \text{GFM} \\ Al = 27 \times 1 = 27 \\ O = 3 \times 16 = 48 \\ H = 3 \times 1 = 3 \\ \hline 78 \text{ g/mol} \end{array}$$

7. What is the percentage of carbon in carbon dioxide (CO₂)?

$$\%C = \frac{12}{44} \times 100 = 27.2\% C$$

$$\begin{array}{r} \text{GFM} \\ C = 1 \times 12 = 12 \\ O = 2 \times 16 = +32 \\ \hline 44 \text{ g/mol} \end{array}$$

8. If you have a 25 gram sample of carbon dioxide (CO₂), how many grams of that is carbon?

$$0.272 \times 25 \text{ g} = 6.8 \text{ g Carbon}$$

9. What is the percentage of sodium in sodium chloride (NaCl)?

$$\% Na = \frac{23}{58} \times 100 = 39.6\% \text{ Sodium}$$

$$\begin{array}{r} \text{GFM} \\ Na = 1 \times 23 = 23 \\ Cl = 1 \times 35 = +35 \\ \hline 58 \text{ g/mol} \end{array}$$

10. How many grams of sodium are in 75.0 g of NaCl?

$$0.396 \times 75.0 \text{ g} = 29.7 \text{ g Na}$$

11. What is the percentage of oxygen in aluminum phosphate (AlPO₄)?

$$\% O = \frac{64}{122} \times 100 = 52.5\% O$$

$$\begin{array}{r} \text{GFM} \\ Al = 1 \times 27 = 27 \\ P = 1 \times 31 = 31 \\ O = 4 \times 16 = +64 \\ \hline 122 \text{ g/mol} \end{array}$$

12. How many grams of oxygen can be obtained from 25.00 grams of aluminum phosphate?

$$0.525 \times 25.0 \text{ g} = 13.1 \text{ g O}$$

13. What is the percentage of silver in silver (II) nitrate (Ag(NO₃)₂)?

$$\% Ag = \frac{108}{232} \times 100 = 46.6\% Ag$$

$$\begin{array}{r} \text{GFM} \\ Ag = 1 \times 108 = 108 \\ N = 2 \times 14 = 28 \\ O = 6 \times 16 = +96 \\ \hline 232 \text{ g/mol} \end{array}$$

14. How many grams of silver can be recovered from 125.0 grams of silver (II) nitrate?

$$0.466 \times 125.0 \text{ g} = 58.25 \text{ g Ag}$$

15. What is the percentage of gold in AuCl₃?

$$\% Au = \frac{197}{302} \times 100 = 65.2\%$$

$$\begin{array}{r} \text{GFM} \\ Au = 1 \times 197 = 197 \\ Cl = 3 \times 35 = +105 \\ \hline 302 \text{ g/mol} \end{array}$$

16. If you have 35.0 grams of AuCl₃, how much gold can be recovered?

$$0.652 \times 35.0 \text{ g} = 22.8 \text{ g Au}$$