Percent Composition II Name Key - Mr. Smithey Peiod _____

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.)

GFM
K = 2 × 39 = 78
O = 1 × 16 = +16
94 g/mol

% K = $\frac{78}{94}$ × 100 = 83 %

% O = $\frac{16}{94}$ × 100 = 17 %

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

GFM
Sr = 3 × 88 = 264
P = 2 × 31 = +62
326 g/mol

% Sr = $\frac{264}{326}$ × 100 = 81%

% P = $\frac{62}{326}$ × 100 = 19 %

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

Na^+ OH^- = NaOH

GFM
Na = 1 × 23 = 23
O = 1 × 16 = 16
H = 1 × 1 = + 1
40 g/mol

% Na = $\frac{23}{40}$ × 100 = 57.5 %

% O = $\frac{16}{40}$ × 100 = 40 %

% H = $\frac{1}{40}$ × 100 = 2.5%

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

GFM
C = 6 × 12 = 70
H = 12 × 1 = 12
O = 6 × 16 = 96
+
178 g/mol

%C = $\frac{70}{178}$ × 100 = 39.3 %

% H = $\frac{12}{178}$ × 100 = 6.7%

%O = $\frac{96}{178}$ × 100 = 53.9 %

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

Cu^{2+} SO_4^{2-} ⇒ $CuSO_4$

criss-cross & reduce

GFM
Cu = 1 × 64 = 64
S = 1 × 32 = 32
O = 4 × 16 = + 64
160 g/mol

% Cu = $\frac{64}{160}$ × 100 = 40%

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

Al^{3+} OH^-

⇒ $Al(OH)_3$

GFM
Al = 27 × 1 = 27
O = 3 × 16 = 48
H = 3 × 1 = + 3
78 g/mol

% H = $\frac{3}{78}$ × 100 = 3.8 %

7. What is the percentage of carbon in carbon dioxide (CO_2)?

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

GFM
C = 1 x 12 = 12
O = 2 x 16 = +32
44 g/mol

8. If you have a 25 gram sample of carbon dioxide (CO_2), how many grams of that is carbon?

$0.272 \times 25g = 6.8g\ Carbon$

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

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

GFM
Na = 1 x 23 = 23
Cl = 1 x 35 = +35
58 g/mol

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

$0.396 \times 75.0g = 29.7g\ Na$

11. What is the percentage of oxygen in aluminum phosphate ($AlPO_4$)?

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

GFM
Al = 1 x 27 = 27
P = 1 x 31 = 31
O = 4 x 16 = +64
122 g/mol

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

$0.525 \times 25.0g = 13.1g\ O$

13. What is the percentage of silver in silver (II) nitrate ($Ag(NO_3)_2$)?

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

GFM
Ag = 1 x 108 = 108
N = 2 x 14 = 28
O = 6 x 16 = +96
232 g/mol

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

$0.466 \times 125.0g = 58.25g\ Ag$

15. What is the percentage of gold in $AuCl_3$?

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

GFM
Au = 1 x 197 = 197
Cl = 3 x 35 = +105
302 g/mol

16. If you have 35.0 grams of $AuCl_3$, how much gold can be recovered?

$0.652 \times 35.0g = 22.8g\ Au$