

Name: _____

Percent Composition Worksheet

1) What is the percent composition of each element in AgNO_3 ?

$\text{Ag} = 107.87$
 $\text{N} = 14.01$
 $3\text{O} = 48.00$

$\left. \begin{array}{l} 107.87 \\ 14.01 \\ 48.00 \end{array} \right\} 169.88$

$\% \text{Ag} = \left(\frac{107.87}{169.88} \right) \times 100 = 63.49\%$
 $\% \text{N} = \left(\frac{14.01}{169.88} \right) \times 100 = 8.25\%$
 $\% \text{O} = \left(\frac{48}{169.88} \right) \times 100 = 28.26\%$

2) What is the percent composition of carbon in $\text{C}_2\text{H}_5\text{O}$?

$2\text{C} = 2(12.01) = 24.02$
 $5\text{H} = 5(1) = 5.00$
 $\text{O} = 16$

$\left. \begin{array}{l} 24.02 \\ 5.00 \\ 16.00 \end{array} \right\} 45.02$

$\left(\frac{24.02}{45.02} \right) \times 100 = 53.35\%$

3) What is the percent composition of hydrogen in H_2SO_4 ? Is this the empirical formula? Yes

$2\text{H} = 2$
 $\text{S} = 32.06$
 $4\text{O} = 64$

$\left. \begin{array}{l} 2 \\ 32.06 \\ 64 \end{array} \right\} 98.06$

$\left(\frac{2}{98.06} \right) \times 100 = 2.04\%$

4) What is the percent composition of sulfur in sulfur hexafluoride?

32.06
 $6(19) = 114$

$\left. \begin{array}{l} 32.06 \\ 114 \end{array} \right\} 146.06$

$\left(\frac{32.06}{146.06} \right) \times 100 = 21.95\%$

5) What is the percent composition of iron in iron (II) sulfide?

55.85
 $+ 32.06$
 $\hline 87.91$

$\left(\frac{55.85}{87.91} \right) \times 100 = 63.53\%$

6) What is the percent composition of lithium in lithium phosphate?

$\text{Li}: 3(6.939) = 20.817$
 $\text{P}: 30.97$
 $\text{O}: 4(16) = 64$

$\left. \begin{array}{l} 20.817 \\ 30.97 \\ 64 \end{array} \right\} 115.79$

$\left(\frac{20.817}{115.79} \right) \times 100 = 17.98\%$

7) What is the percent of water in magnesium chloride dihydrate?

$\text{Mg}: 24.31$
 $\text{Cl}: 2(35.45) = 70.9$
 $4\text{H}_2\text{O} = 18 \times 2 = 36$

$\left. \begin{array}{l} 24.31 \\ 70.9 \\ 36 \end{array} \right\} 131.21$

$\left(\frac{36}{131.21} \right) \times 100 = 27.41\%$

8) A compound has the following percentage composition, 26.7% carbon, 2.2% hydrogen, 71.1% oxygen. The molecular weight of this composition is 90. What is the compound's true formula?

Sample 100g

26.7g C	$\frac{26.7\text{g C}}{12.01\text{g C}} = 2.22 \text{ moles C}$	2	2:2:4
2.2g H	$\frac{2.2\text{g H}}{1\text{g H}} = 2.2 \text{ moles H}$	2	↓
71.1g O	$\frac{71.1\text{g O}}{16\text{g O}} = 4.44 \text{ moles O}$	4	1:1:2

$\frac{90}{45} = 2$
 $\text{C}_2\text{H}_2\text{O}_4$
 $2(\text{CH}_2\text{O}_2) = \text{C}_2\text{H}_2\text{O}_4$
 EF
 $12.01 + 1 + 32 = 45.01\text{g}$

~~C₂H₆~~

9) The percentage composition of ethane gas is 80.0% and carbon and 20.0% hydrogen. The molecular weight for ethane is 30. What is the correct formula for this compound?

100g sample

~~80.0g C~~

20.0g H

~~$\frac{80.0g C}{12.01g} = 6.66 \text{ moles C}$~~

~~$\frac{20.0g H}{1.0g} = 20 \text{ moles H}$~~

~~20~~

On a scale from 1-10 (1 being not good at all and 10 being confident), how do you feel about percent composition? _____

Molecular and Empirical formulas? _____

$0.80(30) = 24g C$

$0.20(30) = 6g H$

$\frac{24g C}{12g} = 2 \text{ mole}$

$\frac{6g H}{1g} = 6 \text{ mole}$

⇒

C₂H₆

2:6