

Name: \_\_\_\_\_  
Blk: \_\_\_\_\_ Date: \_\_\_\_\_

**Chemistry 11**  
**Calculating Percent Composition**

It is sometimes useful to know the percentage, by mass, of a particular element within a chemical compound.

Why?

---

---

---

---

The **FORMULA** for calculating **PERCENT COMPOSITION** is:

**Example 1: What is the percent composition of each ELEMENT in Copper II sulphide?**

**Example 2: What is the percent composition of IRON in Iron III chloride?**

Example 3: What is the percent composition of WATER in Copper II sulphate pentahydrate?

SEATWORK/HOMEWORK:

1. Calculate the percent composition for each element in the following:

- |                        |                           |
|------------------------|---------------------------|
| a. $C_2H_6$            | h. $(NH_4)_3PO_4$         |
| b. $FeCl_2$            | i. $Ag(NH_3)_2Cl$         |
| c. $FeCl_3$            | j. $C_{17}H_{15}N_3O_2Cl$ |
| d. $C_2H_4O_2$         | k. $Sn(S_2O_3)_4$         |
| e. $CaCO_3$            | l. $(NH_4)_2Sn(OH)_6$     |
| f. $NaOH$              | m. $C_2H_4N_2O_4$         |
| g. $CaCl_2 \cdot H_2O$ | n. $K_3Fe(CN)_6$          |

2. Calculate the percentage of the underlined entity contained in one mole of the following:

- |  |   |
|--|---|
| a. $CaCl_2 \cdot 2 \underline{H_2O}$         | e. $Cr(NH_3)_6Cl_3 \cdot H_2O$              |
| b. $CuSO_4 \cdot 5 \underline{H_2O}$         | f. $Cr(NH_3)_6Cl_3 \cdot \underline{H_2O}$  |
| c. $Ce_2(C_2O_4)_3 \cdot 9 \underline{H_2O}$ | g. $Cu(\underline{C_2H_3O_2}) \cdot 2 NH_3$ |
| d. $Al_2(SO_4)_3 \cdot 18 \underline{H_2O}$  | h. $Fe_2(\underline{SO_4})_3 \cdot 9 H_2O$  |

Name: \_\_\_\_\_  
Blk: \_\_\_\_\_ Date: \_\_\_\_\_

## Chemistry 11 Calculating Percent Composition

It is sometimes useful to know the percentage, by mass, of a particular element within a chemical compound.

Why?

Suppose you wanted to decompose a compound to be used as a source of oxygen?

It would be useful to know the percentage of oxygen that a compound contains  
so that you choose the one that will produce the largest amount!

The FORMULA for calculating PERCENT COMPOSITION is:

PERCENT COMPOSITION =	Mass of element present	• 100
	Total mass of the compound	

Example 1: What is the percent composition of each ELEMENT in

Copper II sulphide? CuS

$$1 (\text{Cu}) = 63.5 \text{ g} \div 95.6 \text{ g} \cdot 100 = 66.4 \% \text{ Cu}$$

$$1 (\text{S}) = \frac{32.1 \text{ g}}{95.6 \text{ grams}} \div 95.6 \text{ g} \cdot 100 = 33.6 \% \text{ S}$$

Example 2: What is the percent composition of IRON in Iron III chloride? FeCl<sub>3</sub>

$$1 \text{ Fe} = 55.8 \text{ g} \div 162.3 \text{ g} \cdot 100 = 34.4 \% \text{ Fe}$$

$$3 \text{ Cl} = \frac{106.5 \text{ g}}{162.3 \text{ g}} \div 162.3 \text{ g} \cdot 100 = 65.6 \% \text{ Cl}$$

Example 3: What is the percent composition of WATER in  
Copper II sulphate pentahydrate?  $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$

1 Cu = 63.5 g

1 S = 32.1 g

4 O = 64.0 g

10 H = 10.0 g

90.0 g  $\text{H}_2\text{O} \div 249.6 \text{ g} \cdot 100 = 36.1 \% \text{H}_2\text{O}$

5 O = 80.0 g

249.6 g

SEATWORK/HOMEWORK:

3. Calculate the percent composition for each element in the following:

h.  $\text{C}_2\text{H}_6$

h.  $(\text{NH}_4)_3\text{PO}_4$

i.  $\text{FeCl}_2$

i.  $\text{Ag}(\text{NH}_3)_2\text{Cl}$

j.  $\text{FeCl}_3$

j.  $\text{C}_{17}\text{H}_{15}\text{N}_3\text{O}_2\text{Cl}$

k.  $\text{C}_2\text{H}_4\text{O}_2$

k.  $\text{Sn}(\text{S}_2\text{O}_3)_4$

l.  $\text{CaCO}_3$

l.  $(\text{NH}_4)_2\text{Sn}(\text{OH})_6$

m.  $\text{NaOH}$

m.  $\text{C}_2\text{H}_4\text{N}_2\text{O}_4$

n.  $\text{CaCl}_2 \cdot \text{H}_2\text{O}$

n.  $\text{K}_3\text{Fe}(\text{CN})_6$

4. Calculate the percentage of the underlined entity contained in one mole of the following:

e.  $\text{CaCl}_2 \cdot 2 \underline{\text{H}_2\text{O}}$

e.  $\text{Cr}(\underline{\text{NH}_3})_6\text{Cl}_3 \cdot \text{H}_2\text{O}$

f.  $\text{CuSO}_4 \cdot 5 \underline{\text{H}_2\text{O}}$

f.  $\text{Cr}(\text{NH}_3)_6\text{Cl}_3 \cdot \underline{\text{H}_2\text{O}}$

g.  $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 9 \underline{\text{H}_2\text{O}}$

g.  $\text{Cu}(\underline{\text{C}_2\text{H}_3\text{O}_2}) \cdot 2 \text{NH}_3$

h.  $\text{Al}_2(\text{SO}_4)_3 \cdot 18 \underline{\text{H}_2\text{O}}$

h.  $\text{Fe}_2(\underline{\text{SO}_4})_3 \cdot 9 \text{H}_2\text{O}$