## FQ: What is percent composition by mass?

A compound can be described by how much of each element is in its makeup. If you look at it in terms of mass, this is called percent composition by mass.

For example, if you have an unknown compound, break it into its elements and then find the mass of each element, if would be possible to identify it by its percent composition. (Think CSI)

Water is 11.2% hydrogen by mass and 88.8% oxygen.

If you had 50g of water, 11.2% of that weight (5.6g) would be due to hydrogen and 88.8% of it (44.4g) would be due to oxygen.

## How do I find what percent of $H_2O$ is oxygen?

find the molar mass: $2(1.01g) + 16.00g = 18.02g$

use formula: $\frac{\text{part}}{\text{whole}} \times 100 =$

$$\frac{16.00g}{18.02g} \times 100 = 88.8\%$$

This is to say, if you had 100g of water then 88.8g of it would be due to oxygen.

Or, if you were to decompose water into its elements, you would have 88.8g of $O_2$.

**What is the percent composition of each element in $AlCl_3$?**

**find molar mass:** $26.98\text{g}_{Al} + 3(35.45\text{g})_{Cl} = 133.33\text{g}$

**use formula:**

$$Al: \frac{26.98\text{g}}{133.33\text{g}} \times 100 = 20.24\%$$

$$Cl: \frac{3(35.45\text{g}) = 106.35}{133.33\text{g}} \times 100 = 79.76\%$$

$$100.0\%$$