

Chemistry - The Mole

Empirical and Molecular Formulas

Percent Composition

Example:

Calculate the percent composition of each element in water, H_2O

Example:

What is the percent composition of the elements in Sodium Hydrogen Sulfate (NaHSO_4)

Empirical formulas

Let's see this in reverse

Using the results we had for water, "A compound is found to be 88.8% by mass oxygen and 11.2% hydrogen. Calculate the chemical empirical formula

Note: The empirical formula is the lowest ***whole number*** ratio

Using the percents from sodium hydrogen sulfate, calculate the empirical formula

19.15% sodium, 0.849% hydrogen, 26.69% sulfur, and 53.29% oxygen

Try this on your own.

A compound is found to contain 63.16% oxygen and 36.84% nitrogen.

Calculate the empirical formula.

Try this one as well

A 13.7 g sample contains 4.93 g of aluminum and 8.77 g of sulfur. Calculate the formula of the compound.

Determining the molecular formula from empirical formula and the molar mass

Watch this:

A compound contains only hydrogen and oxygen and has a molar mass of 34.0 g/mol. If the compound is 94.1% oxygen, what is the molecular formula?

Note: The empirical formula is the lowest whole number ratio, and the real molecule may be larger by a factor of “n”

You try this one:

A molecular compound with a molar mass of 78.0 g/mol has the following percents by mass; 92.3% carbon, 7.69% hydrogen. What is the actual chemical formula for the compound?