

# Calculating moles

mass (g) © Miss Martins

\* Calculate moles if given mass and the molar mass

$$n = \frac{m}{M}$$

← mass (g)      ← molar mass (g.mol<sup>-1</sup>)

\* Work backwards to get mass or molar mass

## Stoichiometry

$$n = \frac{N}{N_A}$$

← number of particles  
← Avogadro's number 6,02 x 10<sup>23</sup>

\* Calculate moles if number of particles / compounds / formula units / atoms are given

\* Calculate number of particles / compounds formula units or atoms if you have moles

①  $C = \frac{n}{V}$

← concentration (mol.dm<sup>-3</sup>)      ← volume (dm<sup>3</sup>)

OR ②  $C = \frac{m}{MV}$

← mass (g)      ← molar mass (g.mol<sup>-1</sup>)      ← volume (dm<sup>3</sup>)

\* calculate concentration of a solution if you have moles (formula 1) or mass (formula 2)

\* calculate number of moles if you have concentration + volume

$$n = \frac{V}{V_m}$$

← volume (dm<sup>3</sup>)      ← molar volume at STP is 22,4 dm<sup>3</sup>

For gases ONLY

\* Calculate moles of a gas if you are given volume

\* Calculate volume of a gas

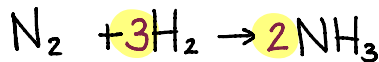
## Other calculations

© Miss Martins

## Empirical formula

# Stoichiometry

### \* Mole ratios \*



### \* Big numbers (coefficients)

in a balanced chemical equation

\* Use mole ratios to go from one compound/molecule to another

### Percentage yield

$$\% \text{ yield} = \frac{\text{Actual yield}}{\text{Theoretical yield}} \times 100$$

what theoretically can be produced

what was actually produced

\* take percentages as mass (g)  
\* convert each elements mass to moles using  $n = \frac{m}{M}$

\* Divide each mole answer by the smallest mole answer  
\* make sure you have whole numbers

### Percentage composition

(percentage by mass)

$$\% \text{ element} = \frac{\text{mass of element (g}\cdot\text{mol}^{-1}) \times 100}{\text{mass of compound (g}\cdot\text{mol}^{-1})}$$

### Percentage purity

$$\% \text{ purity} = \frac{\text{pure mols/mass}}{\text{Impure mols/mass}} \times 100$$

this is the total mass (meaning pure and impure)