- n=Number of moles
- N=Number of particles
- N_A or L =Avogadro's constant→ 6.02×10^{23}
- M=Molar mass $(g\ mol^{-1})$
- m=mass (g)
- Relative atomic mass= Ar or RAM
- Relative formula mass= Mr
- P=Pressure (Kpa)
- T=Temperature (K)
- V=volume (dm^3)
- R=8.31(a constant)
- C=Concentration ($moldm^{-3}$)

- Avogadro's constant: 6.02×10^{23}
- One mole contains 6.02×10^{23} particles
- Number particles (N) ÷Avogadro's constant=Number of moles (n)
- Number of moles (n) x Avogadro's constant=Number particles(N)

- Molar mass is the mass of one mole of a substance (use the relative atomic mass values to calculate the relative formula mass
- No. of moles x M= mass
- Mass ÷M=No. of moles
- n=$\frac{m}{M}$
- n=$\frac{m\ (g)}{M\ (g\ mol^{-1})}$

Empirical formula-Simplest whole no.ratio of the elements in a compound

1. the mass or the % mass of each element
2. Convert the mass of each element to moles by dividing by its Molar mass (M)
3. Divide by smallest no. to give the ratio
4. Approx. to the nearest who number

Composition by mass

1. Calculate total mass of compound
2. Calculate mass of each element
3. Find % mass

Molecular formula

- x(mass of empirical formula)=M

Reacting masses

1. Write the balanced equation
2. Work out the mole ratio for the species in the question
3. Work out the reacting ratio by mass for these species
4. Insert data from the question and solve the ratio

Limiting reactant-determines the amount of products that can form

1. Write a balanced equation
2. Convert given mass to moles
3. Compare given moles with ratio coefficients in the equation
4. Identify limiting reactant
5. Calculate moles of product from given moles of limiting reactant

Percentage yield

- Percentage yield= $\frac{Experimental\ yield}{Theoretical\ yield} \times 100\%$

Gas Calculation

- Equal volumes of all gases when measured at the same temp and pressure contain an equal no. of particles
- n=$\frac{Volume(v)}{Molar\ volume}$
- At standard temperature and pressure, one mole of gas has a volume of 22.7 dm^3 mol^{-1}
- Temp=0° C=273k
- Pressure=100kPa
- cm^3 – x1000→ dm^3 – x1000→m^3

Relationship between pressure, volume and temperature

- p× v =Constant
- $\frac{V}{T}$=Constant
- $\frac{P}{T}$=Constant
- $P \propto \frac{1}{v}$
- $\frac{P_1V_1}{T_1}=\frac{P_2V_2}{T_2}$
- PV= nRT
- R=8.31 JK^{-1}

Concentration of a solution

- N=CV
- Amount solute (mol)=concentration(moldm^{-3})x volume(dm^{3})