

Amounts of substance Knowledge organiser



Vocabulary

Relative Atomic Average mass of an atom 1/... th Carbon 12 Mass: (Ar)

Relative Molecular Average mass of a molecule

1/13 th Carbon 12 Mass: (Mr)

Relative Isotopic

stant

Average mass of an isotope

¹/₁₃ th Carbon 12 Mass:

Avogadro's con-The number of particles that make up

1 mole of a substance.

Mole The unit the amount of a substance is

measured in. The number of particles need to make 12.00g of Carbon-12

Concentration The amount of particles in a fixed vol-

ume. Measured in moles per litre (Mol

dm⁻³)

Ideal gas Idea gases are any gas which behaves

in accordance with the ideal gas equation. It does not matter what substanc-

es are in the gas.

Empirical formula Simplest whole number ratio of the

elements in a compound

Molecular formula The actual ratio of elements in a specif-

ic compound. Should add up to the Mr.

Balanced full A balanced chemical equation showing all atoms and their relative amounts equation

and states

Ionic equation An equation which only shows the spe-

cies which change during a chemical

reaction

The ions omitted from an ionic equa-Spectator ions

tions because they are not involved

Atom economy Mr desired product x100

Mr of all reactants

Calculating moles

$Mass = Mr \times moles$

Mass

g mole-1

moles moles

Calculating concentration

Concentration = moles/Volume

Mol dm⁻³ Concentration

moles moles

 dm^3 Volume

Ideal gas equation

pV = nRT

р	Pressure	Pa (pascals)	$1 \text{ atm} = 1 \times 10^5 \text{ pa}$
V	Volume	m ³	$1m^3 = 1x10^6 cm^3$
n	No. of moles	Moles	
R	Boyles gas const.	J/mol K.	8.314
Т	Temperature	K (kelvin)	T °C + 273

Method for calculations

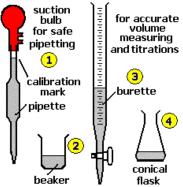
- Calculate the number of moles of the know substance
- Identify the moles of the unknown using the molar ratio
- Use the number of moles for the final calculation

atom economy =

Note: Don't forget to use any associated balancing numbers.

percentage yield =

Note: Often the theoretical mass is not given directly in the question and will need to be calculated.



A variety of apparatus used for measuring liquid volumes and for preparing and manipulating solutions

