Welcome!

RA Session
21/03/2022

Chemistry

Recap

Moles

Avogadro's Constant (N_A)

$1 \text{ mol} = 6.022 \times 10^{23}$ particles

Amount of substance

Base SI Unit (1 of 7)

Unit: mol
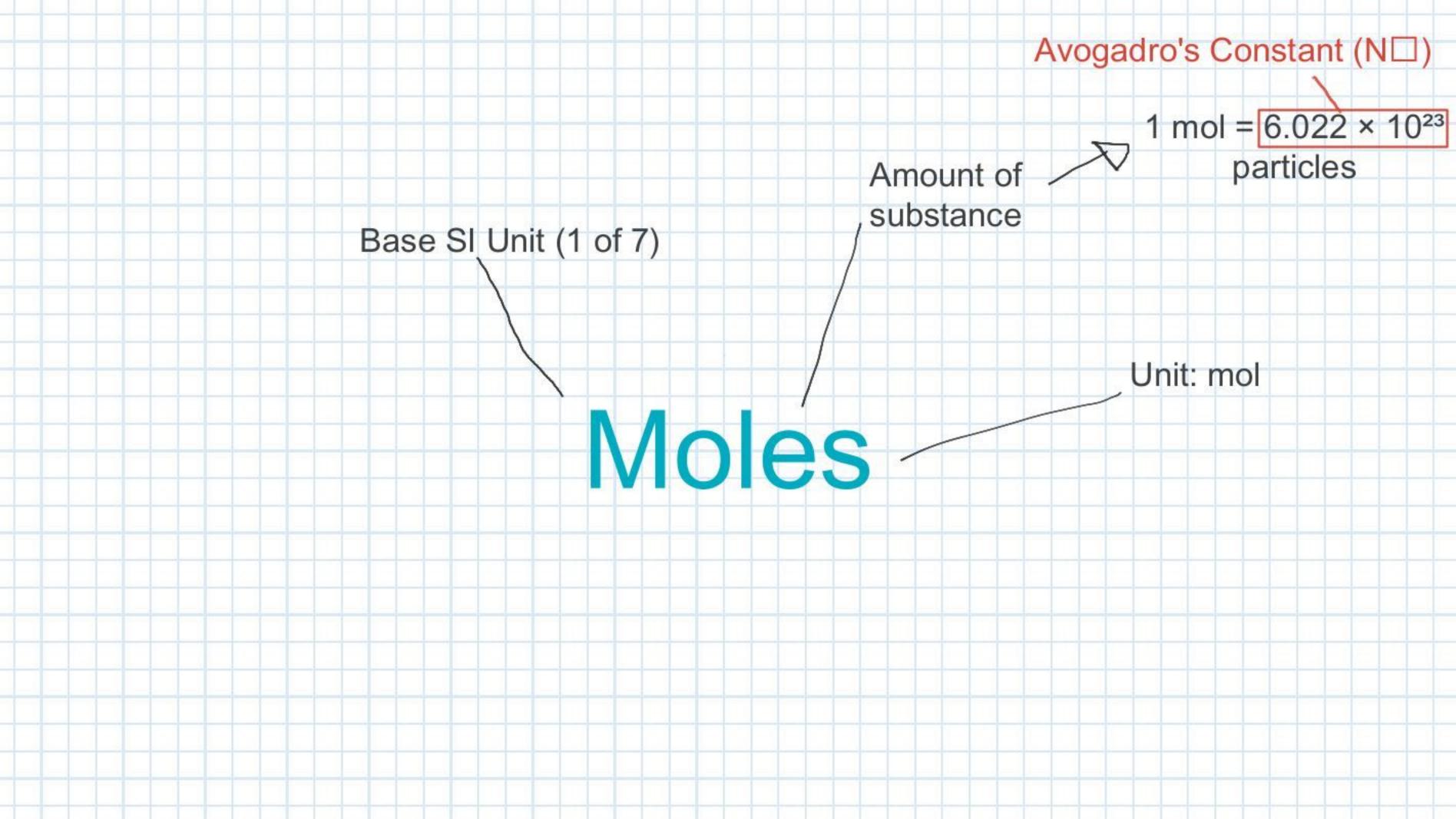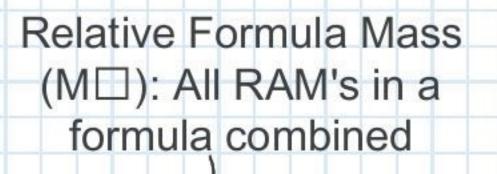
Relative Formula Mass (M☐): All RAM's in a formula combined

Mass of an atom of an element compared to carbon-12

Relative Atomic Mass (A☐)

Mass (in g) of one mol of a substance

Mass number (☐) on PT

amount of
substance

number of moles =

$$\frac{\text{mass}}{A\square \text{ OR } M\square}$$

Worked Examples

ACRONYM
FIFA

Formula

Insert Values

Fine Tune

Answer

Calculate the number of oxygen atoms in 0.5 mol of oxygen molecules, O_2.

6.022×10^{23} atoms in a mol

$$(3.011 \times 10^{23}) \times 2 = 6.022 \times 10^{23}$$

Calculate the mass of 0.10 mol of iron.

Ar of iron = 56

$$mol = mass / Ar$$

$$\times 56 \quad 0.1 = mass / 56 \quad \times 56$$

$$0.1 \times 56 = mass$$

$$0.1 \times 56 = \boxed{5.6 \text{ g}}$$

Calculate the amount of water molecules in 36 g of water.

$M\square$ of water = 18

H_2O = 2 H, 1 O

$A\square$ of H = 1
$M\square$ of H_2 = 1 × 2 = 2

$A\square$ of O = 16
$M\square$ of 1O = 16 × 1 = 16

$M\square$ of H_2O = 18

mol = m / M$\square$

2 = 36 / 18

2 mol

In the reaction shown by the equation below, what mass of nitrogen, N_2, is needed to make 120 g of nitrogen monoxide, NO?

M☐ of NO = 30 and M☐ of N_2 = 28 START with NO

2

$$N_2(g) + O_2(g) \rightarrow 2NO(g)$$

mole ratio { 1 : 1 : 2

mol = m / M☐
4 = 120 / 30

Scale up ratio = 1:1:2 = 2:2:4

2 = ? / 28
? = 2 × 28   56 g
56 = 2 × 28

How to answer reacting masses questions

1. Write the mole equation

2. Insert values for substance with two values (e.g. 12 g and 65 M☐)
REMEMBER: You may have to find or calculate a relative mass

3. Calculate moles

4. Find mole ratio for equation

5. Adjust ratio to fit mole value

6. Insert values for answer into mole equation

7. Calculate answer
REMEMBER: Write units

Practice Questions

Practice questions are available on the Online Quizzing System (OQS) under the title: Online RA Session #01 - Chemistry