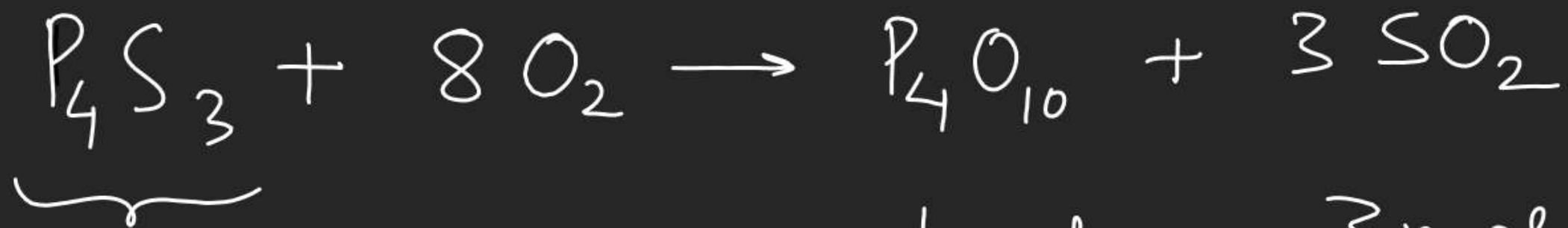


MOLE CONCEPT



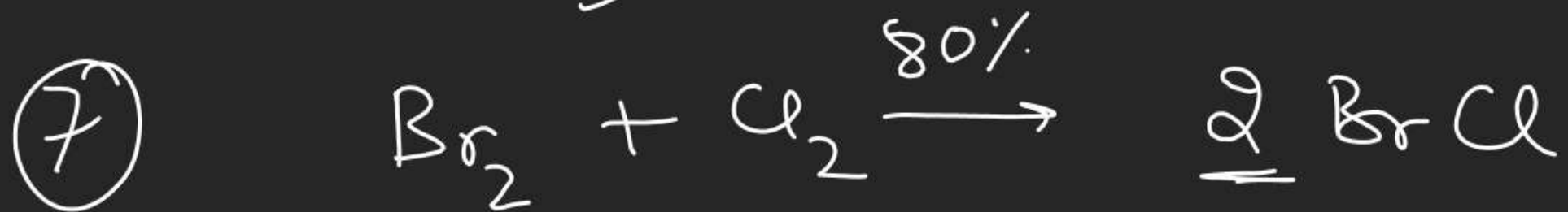
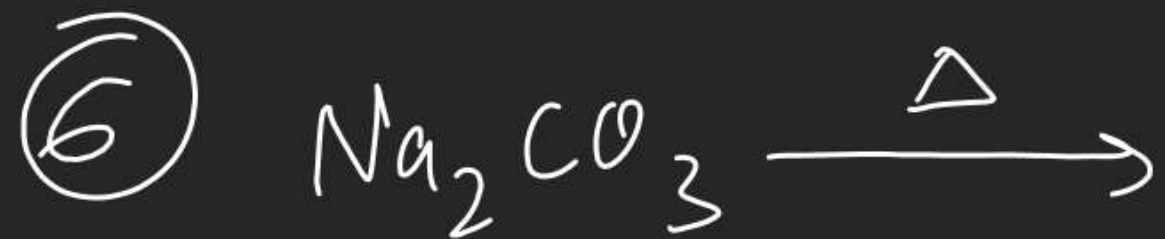
1 mol

3 mol

284 gm

 $3 \times 64 = 192 \text{ gm}$ > 1 gm1 gm $\frac{1}{64} \text{ mol}$

$$\left(\frac{1}{3} \times \frac{1}{64} \text{ mol} \right) \times$$



$$\begin{array}{cc} 0.025 & 0.025 \\ 0.005 & \textcircled{0.005} \end{array}$$

$$\begin{array}{c} 0.025 \times 80 \\ \hline 100 \end{array} \times 2 \quad \textcircled{\quad} \\ \underline{0.04}$$

/. by mass, % by mol & Mavg: \rightarrow

% by number =

mass of each

mass

% by mass

Apple

3

$$\frac{3}{4} \times 100 = 75\%$$

20 gm

60 gm

60%

Mango

1

$$\frac{1}{4} \times 100 = 25\%$$

40 gm

40 gm

40%

Apple

$3N_A$

75%

3 mol

Mango

N_A

25%

1 mol

% by number = % by mol

Q.% by mol

He

50%

CH₄

50%

let the mol

50 mol

50 mol

1 mol

1 mol

mass

4 gm

16 gm

% by mass

$$\frac{4}{20} \times 100 = 20\%$$

$$\frac{16}{20} \times 100 = 80\%$$

He

50%

CH₄

50%

% by mass

let the mass

50 gm

50 gm

16 gm

16 gm

moles

$$\frac{16}{4} = 4$$

$$\frac{16}{16} = 1$$

% by mol

$$\frac{4}{5} \times 100 = 80\%$$

$$\frac{1}{5} \times 100 = 20\%$$

Ar

Br₂

% by mol

60%

40%

let the
mol

6 mol

4 mol

3 mol

2 mol

mass

120 gm

2 × 160
= 320

% by mass

$$\frac{120}{440} \times 100$$

$$= \frac{30}{11}$$

Ar

Br₂

% by mass

50%

50%

let the
mass

160 gm

160 gm

moles

$$\frac{160}{40}$$

$$\frac{160}{160}$$

= 4

= 1

% by mole

80%20%

$$\begin{array}{cc} n_1 & n_2 \\ M_1 & M_2 \end{array}$$

$$\begin{array}{l} \text{Avg} \\ \text{Marks} \end{array} = \frac{n_1 M_1 + n_2 M_2}{n_1 + n_2} = \frac{\text{Totals Marks}}{\text{Total no of students}}$$

 n_1 atoms n_2 atoms

$$M_{\text{avg}} = \frac{n_1 M_1 + n_2 M_2}{n_1 + n_2} = \frac{\text{Total mass}}{\text{Total moles}} = M_{\text{avg}}$$

 $n_1 = \text{no. of atoms}$

or

no. of moles of atoms

Q.

 Cl^{35} Cl^{37}

75%

25% by molesfind average
atomic masslet the
moles

75 mol

25 mol

3 mol

1 mol

$$M_{\text{avg}} = \frac{3 \times 35 + 1 \times 37}{3 + 1}$$
$$= 35.5$$

H_2 (4)
 80% 20% by mol
 4 mol 1 mol
 $4 \times 2 + 1 \times 4$

 5
 $\frac{12}{5} = 2.4$

Q. He CH₄
 20% 80% by mass
 20 gm 80 gm
 $\frac{20}{4}$ $\frac{80}{16}$
 = 5 mol 5 mol
 $M_{avg} = \frac{5 \times 4 + 5 \times 16}{10}$
 = 10

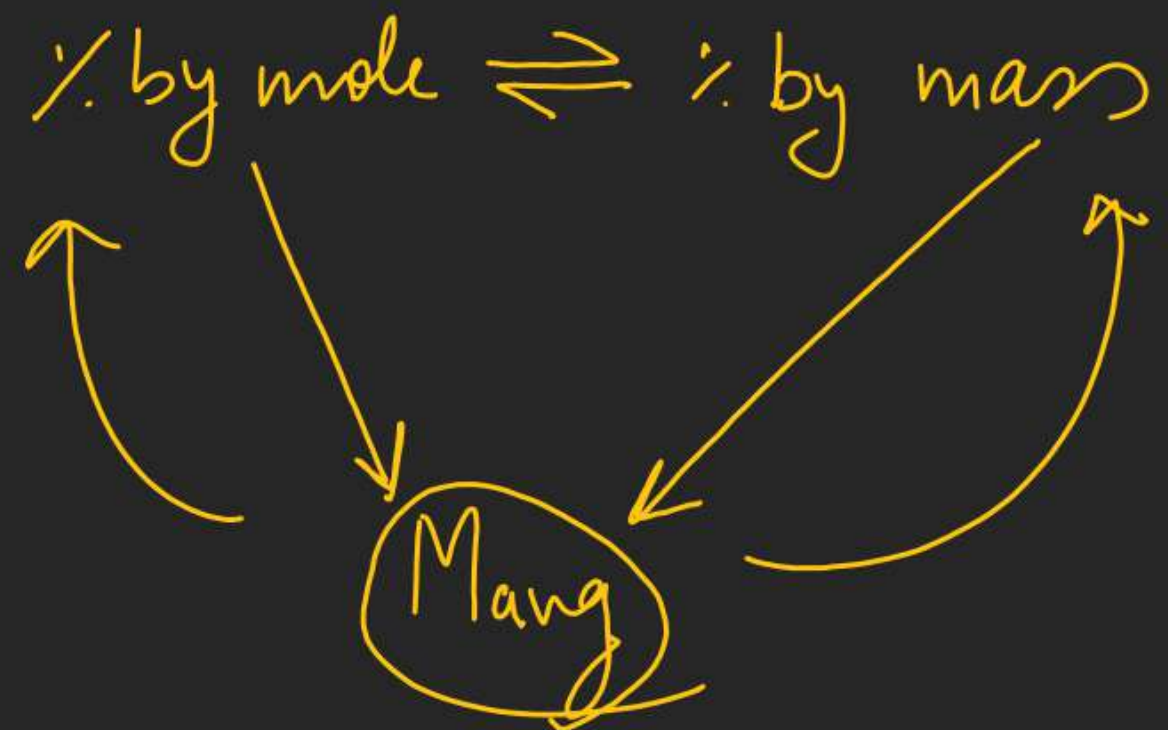
$$M_{avg} = \frac{\text{Total mass}}{\text{Total moles}}$$

$$M_{avg} = \frac{W_1 + W_2}{\frac{W_1}{M_1} + \frac{W_2}{M_2}}$$

$$\begin{aligned}
 &= \frac{20 + 80}{\frac{20}{4} + \frac{80}{16}} \\
 &= \frac{100}{5 + 5} = 10
 \end{aligned}$$

$$M_{\text{avg}} = \frac{\text{Total mass}}{\text{Total moles}}$$
$$= \frac{n_1 M_1 + n_2 M_2}{n_1 + n_2}$$

$$= \frac{w_1 + w_2}{\frac{w_1}{M_1} + \frac{w_2}{M_2}}$$



A mixture of N_2 and O_2 has avg molecular 29.

find % by mol of N_2 & O_2 .

let the moles of $N_2 = x$

" " " " $O_2 = 100 - x$

$$M_{avg} = \frac{n_1 M_1 + n_2 M_2}{n_1 + n_2}$$

$$29 = \frac{x \times 28 + (100 - x) 32}{100 - \cancel{x} + \cancel{x}}$$

$$2900 = -4x + 3200$$

$$4x = 300$$

$$x = 75 \%$$

= % by mol N_2

A mixture of CH_4 & O_2 has average molar mass 24

find (i) % by moles

(ii) % by mass

let the mass of $\text{CH}_4 = x$
 " " " $\text{O}_2 = 100 - x$

$$24 = \frac{16x + (100 - x)32}{100}$$

$$\underline{x = 50\%}$$

→ let the mass of $\text{CH}_4 = x$
 " " " $\text{O}_2 = 100 - x$

$$24 = \frac{w_1 + w_2}{\frac{w_1}{M_1} + \frac{w_2}{M_2}} = \frac{x + 100 - x}{\frac{x}{16} + \frac{100 - x}{32}}$$

$$\frac{x}{16} + \frac{100 - x}{32} = \frac{100}{24}$$

$$\frac{2x + 100 - x}{32} = \frac{100}{24}$$

$$3x + 300 = 400$$

$$\underline{x = \frac{100}{3}}$$

$$\frac{100}{3}\%$$

$$\frac{200}{3}\%$$

J-Mains

5, 6, 7, 8, 10, 11

14-16, 18, 21

J-Adv

1-4

11th