



# Avg Atomic Mass & Avg Molecular Mass

Course on Mole Concept for Class XI

$$\left( \frac{2}{3} \times 15 \times 10^{-3} \right)$$

$$= \frac{0.101}{300}$$

$$\frac{1}{122.5} - \frac{1}{300}$$

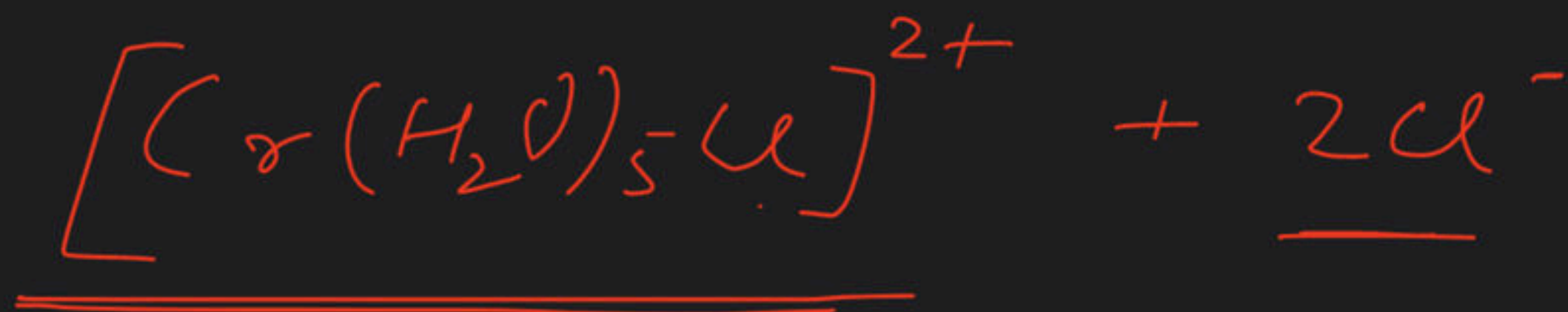
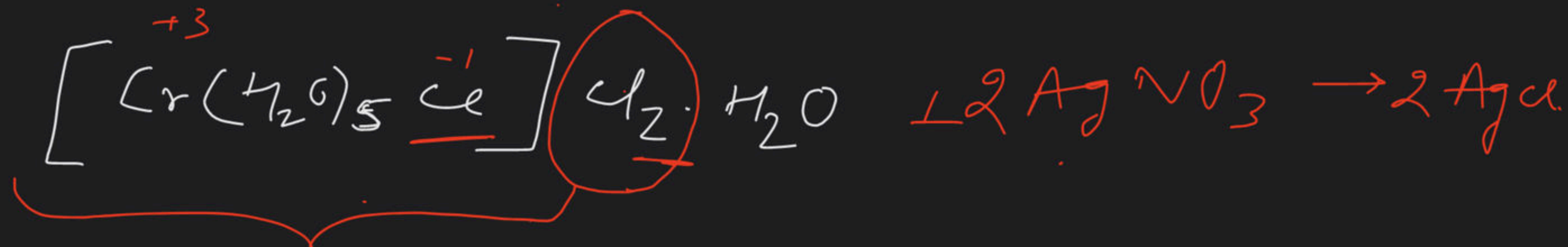
$$\frac{5 \times 10^{-3}}{1 - 5 \times 10^{-3} \times 32}$$

$$\eta_{KCL} = \frac{3}{4} \times \left[ \frac{1}{122.5} - \frac{1}{300} \right] \times 100$$

$$1 - 5 \times 10^{-3} \times 32$$

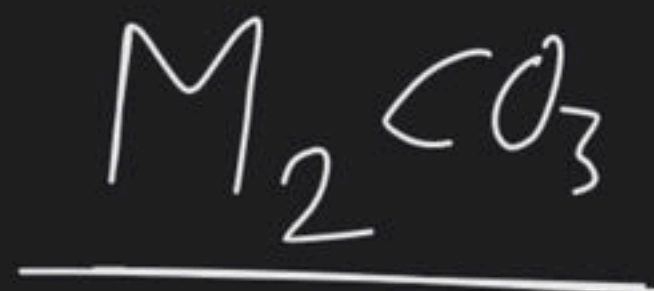
KCL  
KCL

8



$$= \frac{5.33 \times 10^{-3}}{266.5} \times 2 \times 143.5$$

9  
X, Y

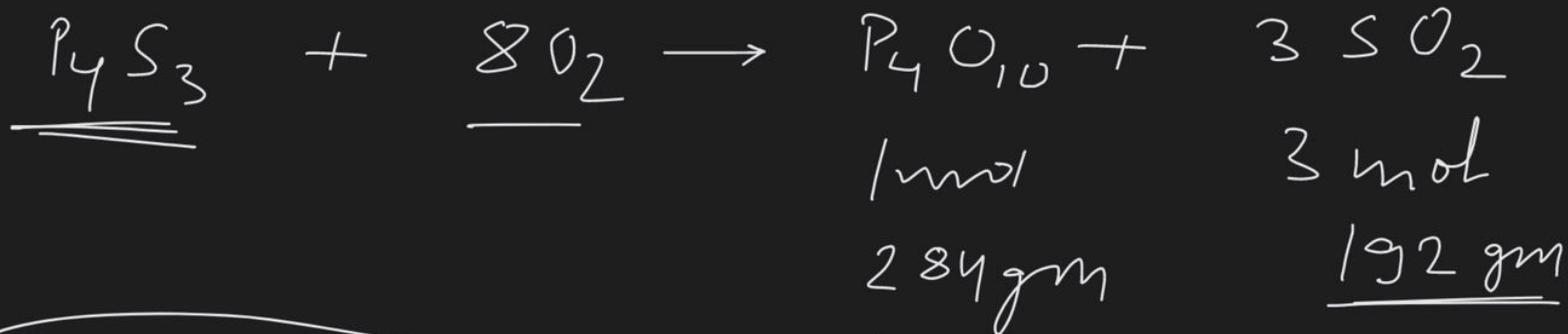


$$\frac{3 \times 16}{2M + 60} \times 100 = 48$$

$$\underline{\underline{M = 20}}$$



12



$$\frac{1}{64} \times \frac{1}{3} \times 220$$

~~1 gm~~

1 gm  $\frac{1}{64}$



$$a - x$$

$$a$$

$$\rightarrow \underline{a(1-x)}$$

$$x/2$$

$$3x/2$$

$$0$$

$$0$$

$$\underline{a/2}$$

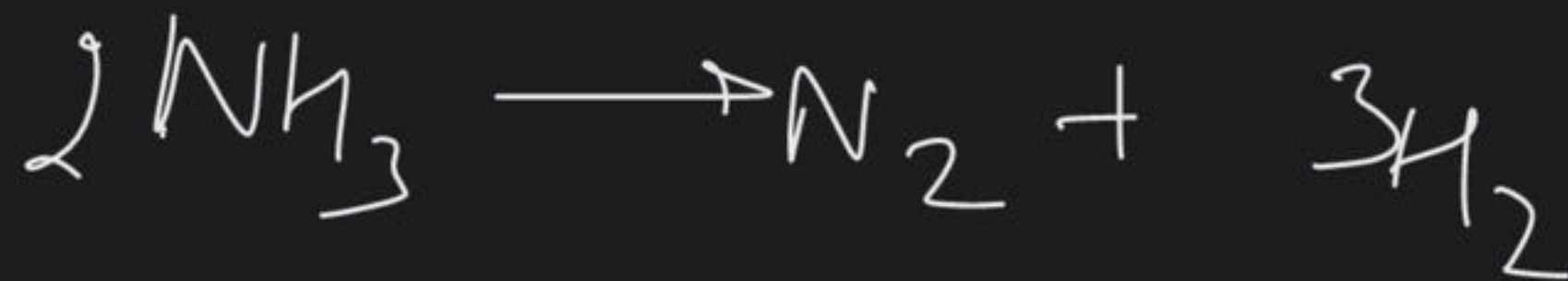
$$\underline{3a/2}$$

$$\underline{M_{avg}} = \frac{\text{Total mass}}{\text{Total moles}} = \frac{a \times 17}{a[1-x + x/2 + 3x/2]}$$

$$= \frac{17}{1+x}$$

Q find  $x$  g  $NH_3$  if  $M_{avg}$  is 12

Given

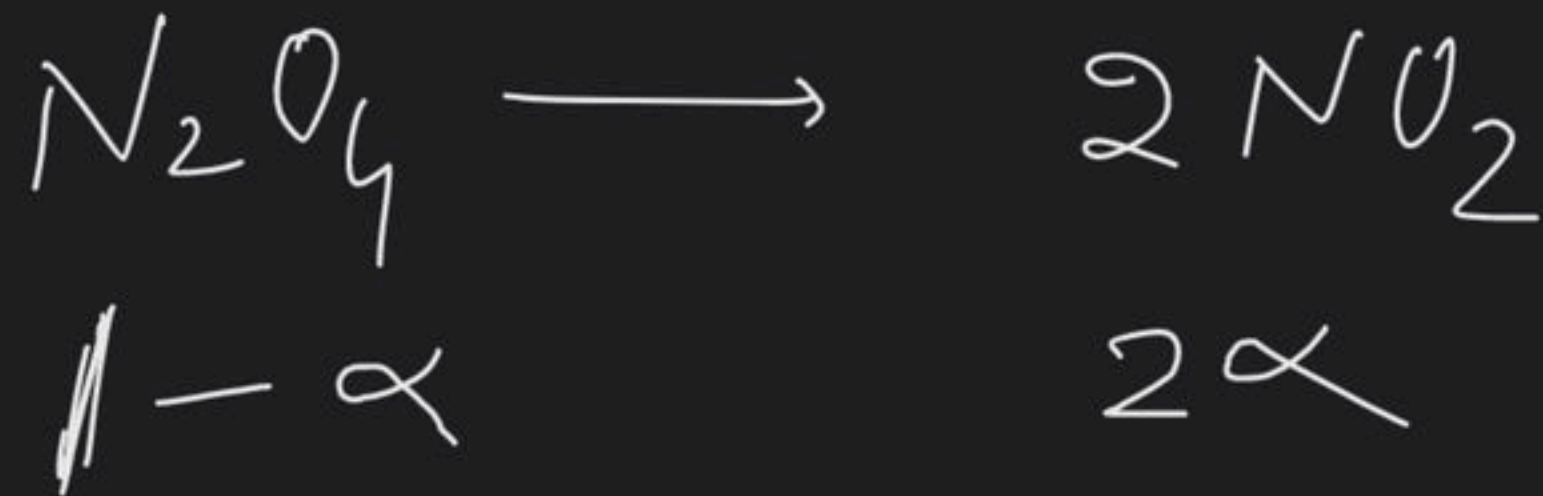


$$12 = \frac{17}{1+x}$$

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



Find ~~M<sub>avg</sub>~~ of Reaction mixture when  
40%  $N_2O_4$  decomposes into  $NO_2$ .



$$M_{avg} = \frac{92}{1+\alpha} = \frac{92}{1.4}$$

$$\left[ M_{avg} = \frac{460}{7} \right]$$



Empirical & Molecular formula:  $\rightarrow$



Molecular formula: It shows the

actual no. of atoms of each element in  
a molecule.



Empirical formula  $\rightarrow$  It shows the

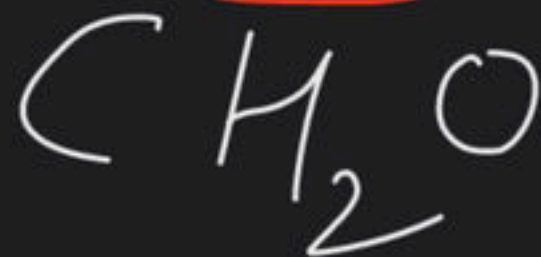
no. of atoms in their simplest

whole no. ratio.

MF



EF





C	H	O	$C_{15}H_2O_8$
60%	8%	32%	by mass

let we  
100 gm  
sample

<sup>15</sup> 60 gm	<sup>2</sup> 8 gm	<sup>8</sup> 32 gm
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EF

$C_5H_8O_2$

60% <u>12</u>	8% <u>1</u>	32% <u>16</u>
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<del>4</del> 5	8	2
120/12	16 gm/1	64/16
10	1.6	4



C	H
75	25%

75 gm

25 gm

75/  
12

25/  
1

6.25

25

1	4
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$\text{NH}_3$

1 gm 3 gm

1 mol 3 mol

$\text{C}_3\text{H}$

by mass

- (A)  $\text{C}_3\text{H}$
- (B)  $\text{CH}_4$
- (C) None

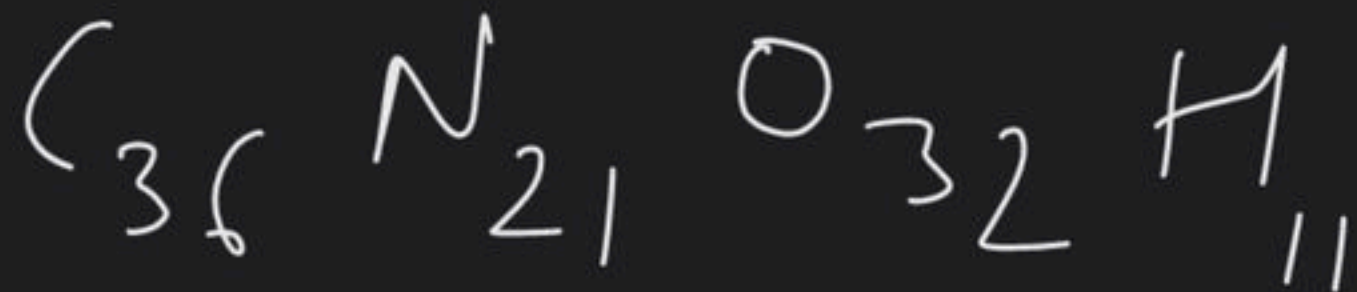
find EF of given Comp if

compound contains 36%, 21%, 32% & 11%

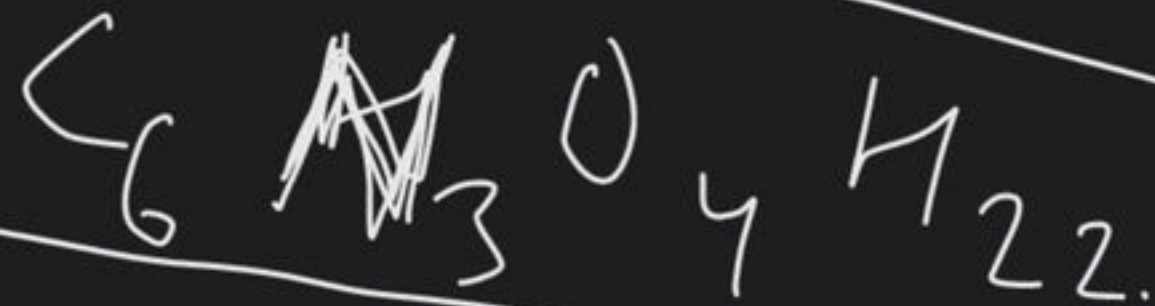
C, N, O & H

by ind.

(A)



(B)



(C)

None



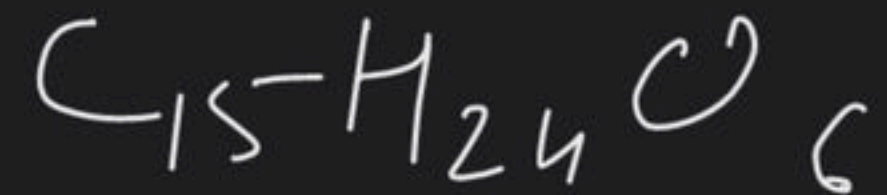
# How to determine MF from EF

① If molecular mass of compound is given.



Mol mass = 300

Mol. F



② If actual no of atoms of an element is given



③ If vapour Density is given.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

gm/cm<sup>3</sup> or kg/m<sup>3</sup>

# Relative density

solid/liq

gases

$$R.D = \frac{\text{density of sub}}{\text{density of ref}}$$

$$\underline{\underline{V.D}} = \frac{\text{Density of gas}}{\text{Density of ref gas at same T \& P}}$$

$$\text{Specific} = \frac{\text{density of sub}}{\text{density of H}_2\text{O}}$$

gravity

at 4°C = 1 gm/ml

$$= \text{density of sub}$$

JM  
&  
JA

$$PV = nRT$$

$$PV = \frac{W}{M} RT$$

$$PM = \frac{W}{V} RT$$

$$PM = \rho RT$$

$$V.D = \frac{(PM/RT)_{\text{gas}}}{(PM/RT)_{\text{ref}}}$$

$$= \frac{M_{\text{gas}}}{M_{\text{ref}}}$$

By default ref gas is  $H_2$

$$V.D = \frac{\underline{\underline{M_{\text{gas}}}}}{2}$$