① Find the moles of oxygen present in 500 g

Ans.

$$\text{Moles of } O_2 = \frac{\text{Wt}}{\text{mol. wt}} = \frac{500}{32} = 15.625 \text{ mol}$$

32) 500 (15.625
480
200
192
80
64
160
160
---

② How many gram of Carbon are present in 264g CO_2?

44 — 12

264 — 2

$$\frac{264 \times 12}{44} = \frac{3168}{44} = 72$$

12
32

44

$$\frac{25.8 \times 3}{4}$$

12 + 32

44g — 12g.

264g — 2

$$\frac{264 \times 12}{44}$$

$$\frac{44 \times 72}{88}$$

$$\frac{3168}{88} = 36$$

24
74
3168

③ Find the molecular weight of $KMnO_4$

K - 39
Mn - 55
O_4 - 64

158

(2.4) A weight of 100 g each of HNO_3 and H_2SO_4 is filled in two separate bottles. Which bottle contains more atoms? How many more

Molecular weight of HNO_3

$1 + 14 + 48 = 63$

moles of HNO_3 = $\frac{100}{63} = 1.58$ moles

Molecular weight of H_2SO_4

$2 + 32 + 64 = 98$

moles of H_2SO_4 = $\frac{100}{98} = 1.02$ moles

$1.58 - 1.02 = 0.56$

$0.56 \times 6.022 \times 10^{23}$

$= 3.37232 \times 10^{23}$ atoms more than the other bottle.

(2.5) How many kilograms of carbon disulphide will contain 3.5 K mol carbon?

Molecular weight of CS_2

$kg\ mol = \frac{Wt.}{mol.\ Wt.}$

$= \frac{Wt.}{mol.\ Wt.}$

CS_2

76 K mol. CS_2 ——— 12 K mol. Carbon

12 K mol Carbon ——— 76 K mol CS_2

3.5 K mol ——— ?

$\frac{3.5 \times 76}{12}$

$\frac{6.33 \times 3.5}{}$

(2.15) Aqueous solution of triethanolamine (TEA), i.e. $N(CH_2CH_2OH)_3$, contains 50% TEA by weight. Find the molarity of the solution if the density of the solution is 1.05 kg/l.

Basis: 100 kg TEA solution

100 kg solution contains 50 kg TEA

Molecular weight of $N(CH_2CH_2OH)_3$

N –	14
C_6 –	72
H_{15} –	15
O	16
	117

$$\text{mole of TEA} = \frac{50}{117}$$

$$\text{mole of TEA} = 0.42 \text{ kgmoles}$$

$$\text{Vol. of Soln} = \frac{100}{1.05} \frac{\text{kg}}{\frac{\text{kg}}{\text{l}}}$$

$$= 95.2 \text{ lit.}$$

117) 500 (0.42
468
320
234
860
819
41

105) 10000 (95.2
945
0550
525
250
210
40

0.3356 k mol.

95.2 l ——— 0.3356 k mol.