When a magnesium ribbon is heated in air it combines with oxygen forming magnesium oxide.
When potassium manganate (VII) is heated it decomposes giving off oxygen which escapes in air

2. *RFM of NaOH = 40*
Moles of NaOH = $\frac{8}{40}$ = 0.2M
Moles of NaOH in 25cm3
$\frac{25 \times 0.2}{1000}$ = 0.005
Mole ratio 1:2
Moles of acid = $\frac{0.005}{2}$
= 0.0025
$\frac{1x\ 0.245}{0.0025}$ = 98

3. *No. Of moles of HNO_3 acid*
$\frac{50 \times 2}{1000}$ = 0.1moles
Mole ratio 1:1
The KOH will have 0.1moles; $\frac{0.1\ X\ 100}{50}$ = 0.2moles
Then D grams is 0.2 X 56
= 11.2g

4. *Number of moles of Q = $\frac{960cm^3 \times 1mole}{24000cm^3}$*
= 0.04moles
Equation:
$Na_2SO_{3(s)} + 2HCL_{(aq)}$ —— $2NaCl_{(aq)} + SO_{2(g)} + H_2O_{(l)}$
Mole ratio Na_2SO_3 : SO_2 is 1:1
∴No. of moles of Na_2SO_3 = 0.04moles
Mass of Na_2SO_3 = $126gmol^{-1}$ x 0.04
= 5.04g

5. *From the equation*
- (3x24) litres of chlorine react with iron to produce [(56 x 2) + (35.5 X3)] g of $Fecl_3$.
325 g of $Fecl_3$ is produced by 72 litres of cl_2
Then 0.5g of fecl3 is produced by:
$\frac{0.5 \times 72}{325}$ =0.11078 litres
= 110.78 cm^3

6. *RMM (CH_3OOH) = 60* ½
Mass of $15cm^3$ and = 1.05 x 15 = 15.75g ½
Moles in $500cm^3$ solution = $\frac{15.75}{60}$ = 0.2625 1
Molarity = $\frac{1000 \times 0.2625}{5000}$ = 0.525M ½

7. *If 24000cm^3 = 1mole*

$150cm^3 = ?$

$\frac{150 \times 1}{24000} = 0.00625 \text{moles of } CO_2$

Since the ratio of Na_2CO_3; O_2 produced is 1:1 the mass of $Na_2CO_3 = 0.00625 \times 106 = 0.6625g$

Na_2Co3	H_2O
Mass 0.6625g	1.0125g
RFM 106	18
Mole 0.6625 = $\frac{0.00625}{106}$	$\frac{1.0125}{18} = 0.5625$
Ratio $\frac{0.00625}{0.00625} = 1$	$\frac{0.05625}{0.0.00625} = 9$
$Na_2CO_3.9H_2O$	

8. $MgCl_2 \longrightarrow Mg^{2+}_{(s)} 2Cl^-$

$R.F.M \text{ of } MgCl_2 = 24 + 71 = 95$

$\text{Moles of Mass} = \frac{1.7}{R.F.M} = \frac{1.7}{95}$

$= 0.01789 \text{moles}$

$1 \text{ mole of } MgCl_2 = 2 \text{moles of Cl-ions}$

$0.01789 \text{moles of } MgCl_2 = 0.01789 \times 2$

$= 0.03478 \text{moles of } Cl^- \text{ions}$

$1 \text{mole} = 6.0 \times 10^{23} \text{ions}$

$0.03578 \text{moles} = \frac{0.03578 \times 6.0 \times 10^{23}}{1}$

$= 2.1468 \times 10^{22} \text{ ions of } Cl^-$

12. $\text{Mass of } O_2 = (4.0 - 2.4) = 1.6g$

$\text{Moles of } O_2 = {}^{1.6}/_{16} = 0.1$

If 1 mol O_2 _____ $24000cm^3$

0.1 Mol Mg = 0.5 mol $_{O2} = 1200cm^3$

OR

2mg	:	O2
2(24)		24000

${}^{2.4}/_{2(24)} = {}^{x}/_{240000}$

$X = \frac{2.4 \times 24000}{2(2.4)} = 1200cm3$

13. i)

Fe	S	O	H_2O
${}^{20.2}/_{56}$	${}^{11.5}/_{32}$	${}^{23.0}/_{16}$	${}^{45.3}/_{18}$
${}^{0.36}/_{0.36}$	${}^{0.36}/_{0.36}$	${}^{1.44}/_{0.36}$	${}^{2.52}/_{0.36}$
1	1	4	7

Empirical formula: $FeSO_4 + H_2O$

ii) $6.95g = {}^{6.95}/_{278} = 0.025$

$\therefore$ $0.05 \text{ moles in } 250cm^3 = 0.025 \times {}^{1000}/_{250} = 0.1$