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 **P**
Moles of NaOH in 25cm3
$\frac{25x0.2}{1000}$ = 0.005 **P**
Mole ratio 1:2
Moles of acid = $\frac{0.005}{2}$
= 0.0025
$\frac{1x0.245}{0.0025}$ = 98 **P**

3. *No. Of moles of HNO_3 acid*
$\frac{50x2}{1000}$ = 0.1moles
Mole ratio 1:1 **P**
The KOH will have 0.1moles; $\frac{0.1X100}{50}$ = 0.2moles
Then D grams is 0.2 X 56
= 11.2g

4. *Number of moles of Q = $\frac{960cm^3x1mole}{24000cm^3}$*
= 0.04moles
Equation:
$Na_2SO_{3(s)} + 2HCL_{(aq)} \rightarrow 2NaCl_{(aq)} + SO_{2(g)} + H_2O_{(l)}$
Mole ratio Na_2SO_3 : SO_2 is 1:1
\ No. of moles of Na_2SO_3 = 0.04moles
Mass of $Na_2SO_3 = 126gmol^{-1} \times 0.04$
= 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:
$\frac{0.5x72}{325}$ =0.11078 litres
= 110.78 cm^3

6. *RMM (CH_3OOH) = 60* **P ½** **P ½**

Mass of 15cm³ and = 1.05 x 15 = 15.75g

Moles in 500cm³ solution = $\frac{15.75}{60}$ = 0.2625 P 1

Molarity = $\frac{1000x0.2625}{5000}$ *= 0.525M* P ½

7. *If 24000cm³ = 1mole*

150cm³ = ? P

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

Since the ratio of Na_2CO_3; O_2 produced is 1:1 the mass of Na_2CO_3 = 0.00625 x 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. $MgCl_2$ $Mg^{2+}{}_{(s)}\ 2Cl^-$

R.F.M of $MgCl_2$ = 24 + 71
= 95

Moles of Mass = $\frac{1.7}{95}$
= 0.01789moles

I mole of $MgCl_2$ = 2moles of Cl-ions

0.01789moles of $MgCl_2$ = 0.01789 x 2
= 0.03478moles of Cl^- ions

1mole = 6.0×10^{23} ions

0.03578moles = $\frac{0.03578 \times 6.0 \times 10^{23}}{1}$
= 2.1468×10^{22} ions of Cl^-

12. Mass of O_2 = (4.0 – 2.4)= 1.6g

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 $= 6.95/278 = 0.025$

\ 0.05 moles in 250cm^3 = 0.025 x $1000/250$ = 0.1