



Chemistry  
P-2.  
Form III

## MARKING SCHEME

- Q1. (a) 2, 8 ✓ (b)  $3V_{(s)} + Q_{(g)} \rightarrow V_3Q_{(s)}$  ✓  
 (c) M has a higher ionisation energy than T since the outer electrons in M are closer to the nucleus hence held more strongly. ✓

Q2.  $\frac{t_{SO_2}}{t_0} = \sqrt{\frac{M_{SO_2}}{M_0}}$  ✓

$M(SO_2) = 32 + 16 \times 2 = 64$  ✓<sup>1/2</sup>

$M_0 = 16 \times 2 = 32$  ✓<sup>1/2</sup>

$t_{SO_2} = 50 \sqrt{\frac{64}{32}}$  ✓

$= 50 \times \sqrt{2}$

$= 70.7 \text{ seconds.}$  ✓

- Q3. (i) Light ✓  
 (ii) Inert ✓

- Q4 (a) Permanent change ✓  
 (b) Permanent change ✓  
 (c) Temporary change ✓



Q5. Moles of  $H_2SO_4$  that reacted =  $\frac{40}{1000} \times 0.5 = 0.02$  ✓

(i) Moles of  $Na_2CO_3$  that reacted =  $0.02$  ✓  
 mole ratio  $Na_2CO_3 : H_2SO_4$   
 $1 : 1$

(ii) Mass = moles  $\times$  F.M.  
 $= 0.02 \times 106$   
 $= 2.12 \text{ g}$  ✓

Percentage of purity =  $\frac{2.12}{2.15} \times 100$   
 $= 98.6\%$  ✓

- (iii) - water softening ✓  
 - manufacture of glass ✓  
 - making of soap ✓  
 - making of sodium hydrogen carbonate - Baking powder ✓

Q6.  $T_1 = 20^\circ C = 293 \text{ K}$  ✓  
 $T_2 = 0^\circ C = 273 \text{ K}$  ✓

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$V_2 = \frac{98,648.5 \times 0.15}{293 \times 101325} \times 273$$

$$= 0.1088 \text{ dm}^3$$
 ✓

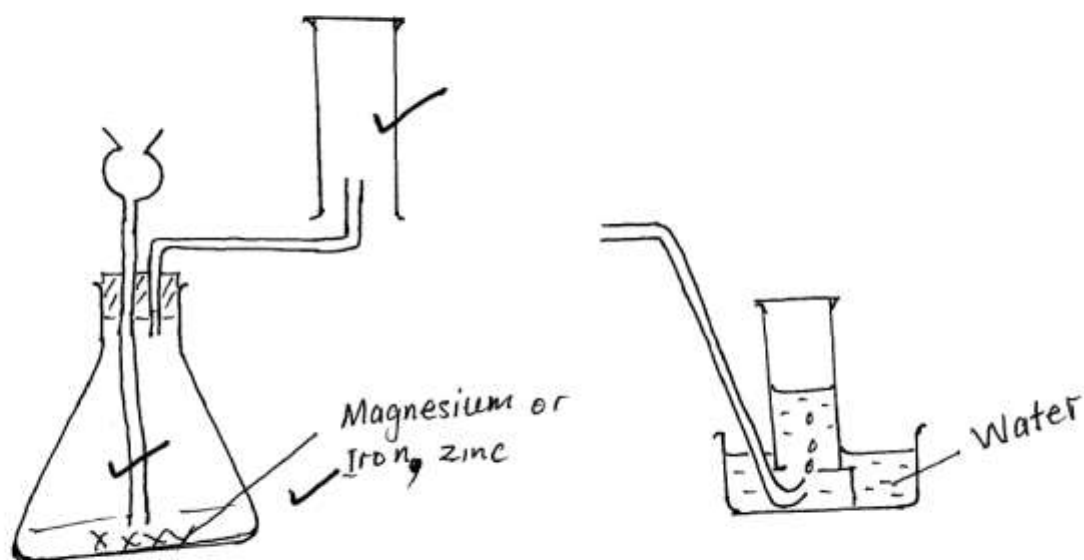
Q7. Aluminium has three valency electrons and sodium  
 (a) only one. Aluminium has more electricity carriers. ✓

(b) Low density // light ✓



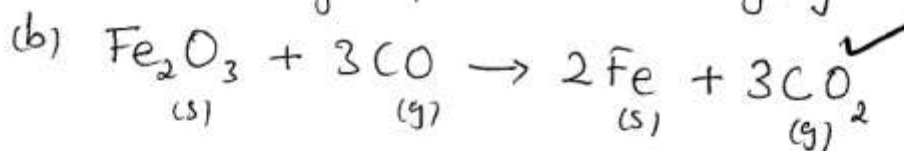
- Q8. (a) - Thistle funnel too short.  
 - Use of sodium metal  
 - wrong gas collection method.

(b)



- (c) Burns with a pop sound. ✓

Q9. (a) Solid changes from brown to grey ✓



- (c) Reducing agent. ✓

Q10. Tartaric acid attacks (reacts) with sodium hydrogen carbonate producing carbon dioxide gas which escapes through the dough creating passages through which hot cooking oil rises. — CO<sub>2</sub> gas causes the dough to rise ✓



11. (a) The volume of a fixed mass of a gas is inversely proportional to its pressure provided the temperature remains constant.

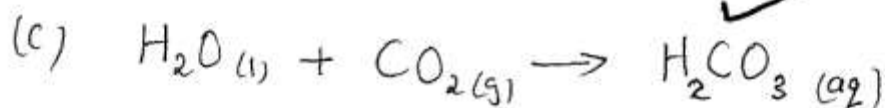
$$(b) P_1 V_1 = P_2 V_2$$

$$V_2 = \frac{800 \times 300}{200}$$

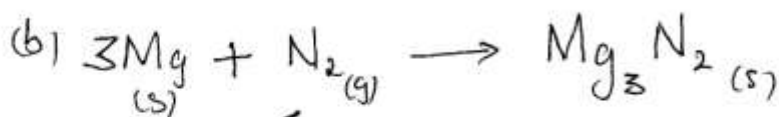
$$= 1200 \text{ cm}^3$$

Q 12. (a) Oxygen in the room will be insufficient resulting to formation of CO gas which is poisonous.

(b) carbon IV oxide

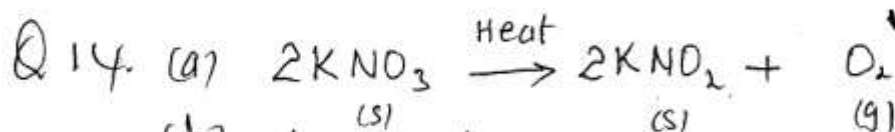


Q 13 (a) A — carbon IV oxide  
B — oxygen.

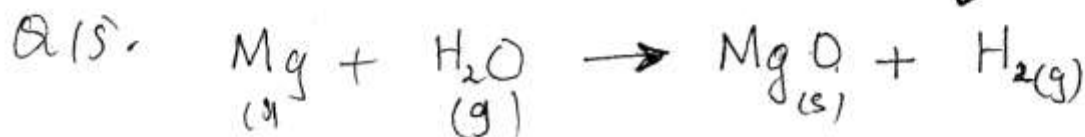


(c) Neon or Helium

Reason — The gas is inert.



(b) Thermo decomposition.

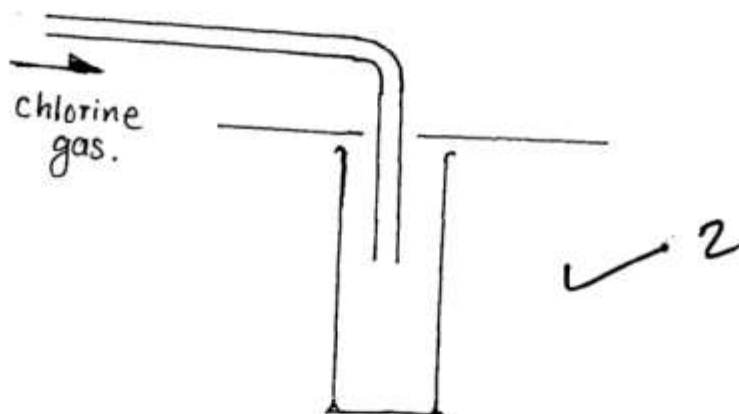






Q 16. The gas dissolves in water forming HCl and HOCl. ✓<sup>2</sup>  
 HOCl being unstable decompose forming HCl and Oxygen free radical that attach // combine with pigment which loses colour.

(b)



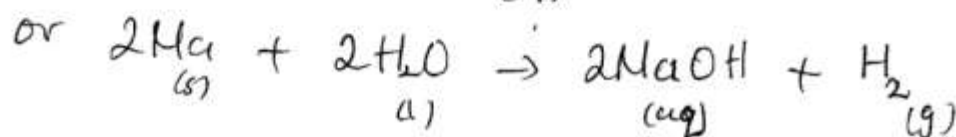
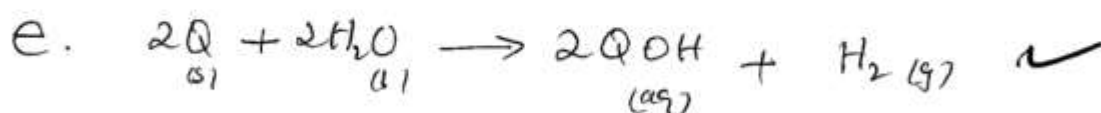
Q 17

(a) Alkali Metals ✓

(b) Energy required to remove an electron from an atom ✓

(c) P has the smallest atomic radius and therefore the valency electron is most strongly attracted to the nucleus. ✓<sup>2</sup>

(d) - Melts due to heat produced in the reaction ✓  
 - hissing sound due to the production of hydrogen ✓  
 - floats on water, sodium is less dense than water.





Q18 (a) Chemical change - a new substance is formed. ✓

$$(b) \frac{Y-X}{Y} \times 100 \%$$

(c) No effect - volume of oxygen in test tube remains the same.

(d)   
 - oxygen is used   
 - both form oxides   
 - mass increases in both cases || any 2

Q19 (a) I ✓ and J ✓

(b) H ✓ and I ✓

