

1. a) i) J_2M ✓1
- ii) K is more✓1 reactive than N because K has smaller nuclear✓1 attraction than N/0 N is less reactive than K. N has large nuclear attraction than K. 2
- iii) K has larger✓1 atomic size than O. Electron to proton repulsion is lesser in K than in O. K has smaller nuclear attraction than O. 2
- b) Ionic.✓1½ ½
- c) i) Decrease in reactivity due to difficulty to loss outer electrons.✓1 1
- ii) Increase in reactivity due to ease to gain electrons.✓1

- I
- i) TCl_3 ✓1
- ii) UO_2 ✓1
- iii) V_2O_5 ✓

II R - Ionic bond✓1½ ½

U - Covalent bond✓1½ ½

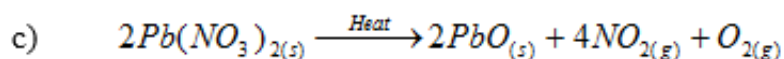
III i) The Chloride of U forms a simple molecular structure✓1 with lower melting point while its Oxide forms a giant atomic structure✓1 with higher melting point. 2

ii) Chloride of T sublimes.✓1

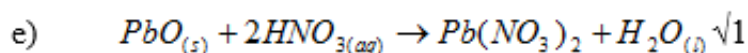
2. a) F - Lead II Nitrate✓1
- G - Nitrogen IV Oxide✓1
- H - Oxygen gas.✓1
- M- Lead II Oxide✓1
- J - Lead II Nitrate solution ✓1

5 Penalize if formular

b) Thermal decomposition.✓1



d) Pass the gas on moist ✓1½blue litmus paper. The blue litmus paper turns from blue to red.✓1½



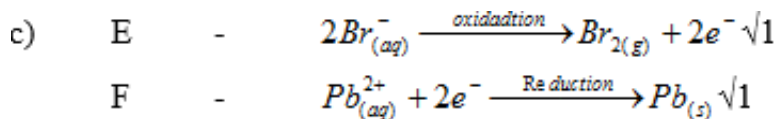
f) Solution K.....Nitric (V) acid✓1½ ½ Insoluble salt Lead (II) Sulphate✓1½ ½

g) Add✓1 excess Copper to Nitric (V) acid. Filter✓1½ to obtain the filtrate of Copper II Nitrate Add excess ✓1½Ammonium Sodium /Potassium Carbonate to the filtrate to obtain ✓1½the residue of Copper (II) Carbonate. Wash with distilled water, dry between filter paper

3. a) E - Anode ✓1½
- F - Cathode ✓1½ ½

b) E - Red/brown gas $\sqrt{1 \frac{1}{2}}$

F - Grey solid $\sqrt{1}$



e) Ions become localised $\sqrt{1 \frac{1}{2}}$

due to resolidification $\sqrt{1 \frac{1}{2}}$ of PbBr_2 . 1

f) Electrolysis. $\sqrt{1 \ 1}$

g) Prevent rusting/corrosion $\sqrt{1}$

4. i) J - Propan-1-ol $\sqrt{1 \ 1}$

L - 2-Chloroprop-1-ene $\sqrt{1 \ 1}$

(ii) Concentrated sulphuric VI acid. $\sqrt{1}$

Heat (160°C - 180°C) $\sqrt{1 \ 2}$

(iii) Reagent - Hydrogen gas $\sqrt{1}$

1 Condition - 180 - 2000°C $\sqrt{1}$

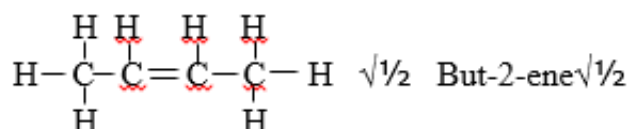
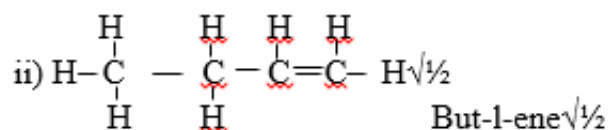
1 -Nickel catalyst $\sqrt{1}$

1 -Packaging papers

1 (iv) Making rain coat Insulators Electric cables

1 Square bottles/wash bottles/toys

(v) i) Are compounds with the same molecular formula but different structural formula



5. a) i) Concentrated sulphuric VI acid $\sqrt{1 \ 1}$

ii) Potassium Nitrate $\sqrt{1 \ 1}$

b) i) Nitric (V) acid is a stronger oxidizing agent $\sqrt{1 \frac{1}{2}}$.

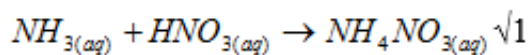
It will corrode/react/attract rubber $\sqrt{1 \frac{1}{2}}$. 1

ii) Nitric (V) acid is reduced to Nitrogen II Oxide $\sqrt{1 \frac{1}{2}}$ gas (colourless) $\sqrt{1 \frac{1}{2}}$.

The gas in open is oxidized by oxygen to Nitrogen^{1/2} IV Oxide (brown gas)^{1/2} 2

c) i) Water/steam/cracking of alkanes/natural gas/ crude oil/water gas (CO+H₂)/Biogas petroleum /etc. any two (2 marks) 2

ii) Electrolysis of dilute NaCl



$$\left(\frac{3200kg \times 17kg}{80kg} \right) = 680kg$$

iii) -Explosive/hence use in production of TNT. -Production of polymers (e.g. terylene) plastics/dyes.
-Oxidizing agent. -Purification of gold or platinum/manufacture of roya/ water. (any two=2 marks)
2 6

6.

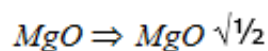
$$MgO = 20.92 - 19.52 = 1.4g$$

$$Mass\ of\ oxygen = 1.4 - 0.84 = 0.56g$$

$$\% \text{ of oxygen in } MgO = \frac{0.56}{1.4} \times 100 = 40\% \checkmark 1$$

$$Mg\ in\ MgO = \frac{0.84}{1.4} \times 100 = 60\% \checkmark 1$$

$$\begin{array}{ccc} Mg & : & O \\ \frac{60}{24} \checkmark \frac{1}{2} & : & \frac{40}{16} \checkmark \frac{1}{2} \\ \frac{2.5}{2.5} & : & \frac{2.5}{2.5} \checkmark \frac{1}{2} \end{array}$$



b) i) Answer

$$R \propto \frac{\sqrt{R.F.M\ O_2}}{\sqrt{R.F.M\ SO_2}}$$

$$\frac{200}{\frac{60}{300} T} = \frac{\sqrt{32}}{\sqrt{64}} \checkmark 1$$

$$\frac{3.333}{\frac{300}{T}} = \frac{5.66}{8} \checkmark 1$$

$$\frac{300}{T} \times \frac{5.66}{1} = 3.333 \times 8$$

$$T \times \frac{1698}{T} = 26.664T$$

$$\frac{1698}{26.664} = \frac{26.664}{26.664} \checkmark \frac{1}{2}$$

$$63.68\ sec\ onds \checkmark \frac{1}{2}$$

7. A)i) Grey solid turns to green. Iron is oxidized by hydrogen chloride gas to iron II chloride which is green. $\checkmark 2$
- ii) Iron III Chloride/ (accept correct formular)/ $FeCl_3$ 1
- iii) It sublimes $\checkmark 1$ and hydrolyses in the presence of water.(any one property 1 mark) 1
- iv) To keep solid R dry. $\checkmark 1$ 1
- v) Manganese IV Oxide and concentrated hydrochloric acid $\checkmark 1$ (both must be correct.1
- vi) It would form and then hydrolyse to a solution containing hydrochloric acid. Hence not collected

as a sublimate. 1

vii) A part from drying $\sqrt{1/2}$ the gas it also absorbs $\sqrt{1/2}$ excess chlorine gas which is poisonous if left to escape. 1 B)

i) Yellow deposit. $\sqrt{1}$ Chlorine gas oxidizes hydrogen sulphide to sulphur which is yellow $\sqrt{1}$.

