

# CHEMISTRY

## Answer Key to Self-Assessment Sample Paper - 1

1. a)

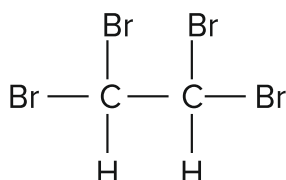
i) valence

ii)  $OH^{\ominus}$

iv)  $950^{\circ}C$

v) Molybdenum

iii)



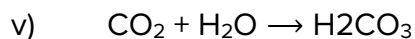
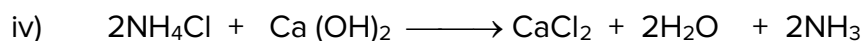
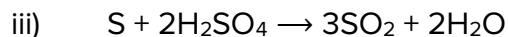
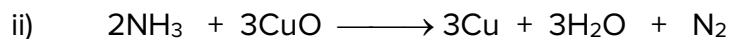
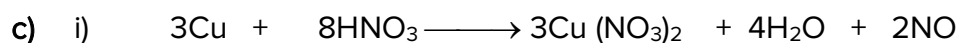
b) i) C

ii) B

iii) A

iv) D

v) A



d) i) Ketone

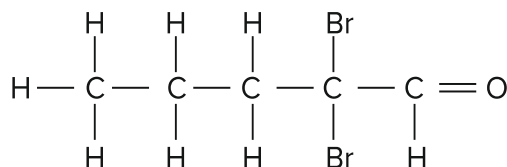
ii) molecule

iii) Ammonium chloride

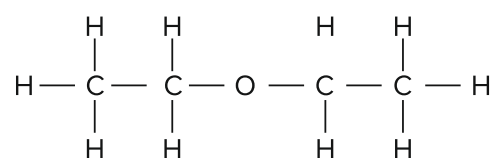
iv) phosphorus pentoxide

v) Tollen's Reagent.

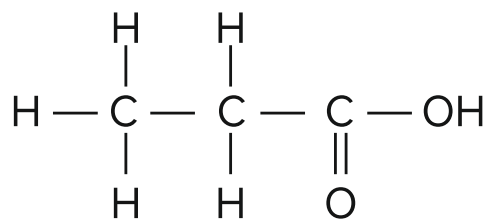
e) i) 1)



2)



3)

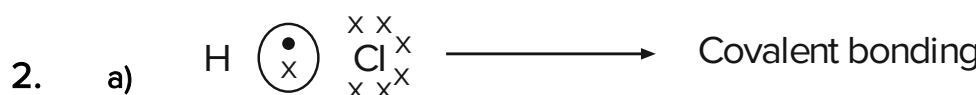


ii) oxidation, reducing agent

f) i)  $\text{X}_4\text{Y}_2$                       ii) % of N =  $\frac{28}{80} \times 100$   
 $= 35\%$   
 % of O =  $\frac{48}{80} \times 100$   
 $= 60\%$

- g) i) 18                      v) 20  
 ii) 6  
 iii) 4  
 iv) 17

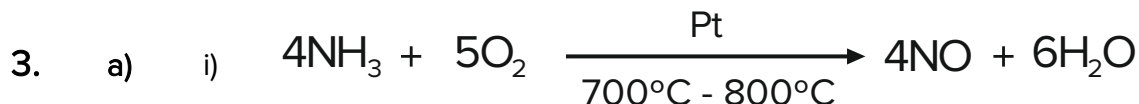
- h) i) White ppt. insoluble in all mineral acid.  
 ii) Rotten egg smelling gas evolved that turns lead acetate paper black.  
 iii) Orange to yellow  
 iv) Blue colour remains same  
 v) Burns with a blue flame.



- b) 1  $\rightarrow$  white ppt  $\longrightarrow$  soluble  
 2  $\rightarrow$  pale blue ppt  $\longrightarrow$  insoluble

3 → dirty green → insoluble

c) C<sub>3</sub>H<sub>8</sub>

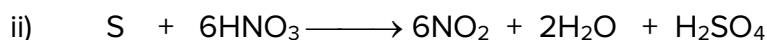
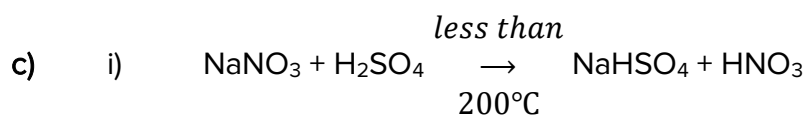
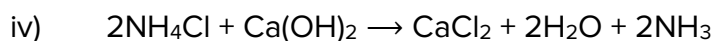


ii) Decomposes to form NO<sub>2</sub> which remain dissolved.

iii) Brown ring test

b) i) Ammonium chloride/Sal ammoniac      ii) Pungent smelling

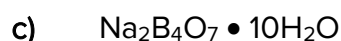
iii) Nessler's reagent turns brown.



4. a) i) Hydrogen sulphide → Turns lead acetate paper black.

ii) Carbon dioxide → Lime water milky but acidified dichromate solution unaffected.

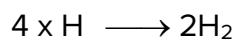
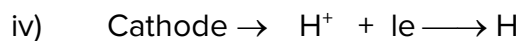
b) i) Li, Na, K      ii) Br, Cl, and F      iii) He, Be, Si



$$\% \text{ of B} = \frac{44}{382} \times 100 = 11.5 \%$$

5. a) i) Acidified water      ii) Cathode

iii) B → oxygen      C → Hydrogen



v) Non-volatile & non-interfering ions

b) i)  $150^\circ\text{C} - 200^\circ\text{C}$       ii)  $50^\circ\text{C} - 60^\circ\text{C}$       iii)  $1100^\circ\text{C}$

c) Hydronium ion /  $H_3O^+$

6. a)

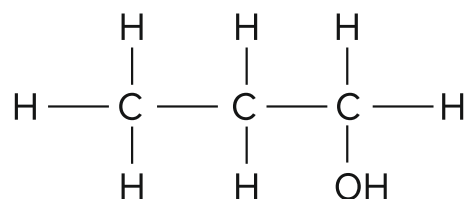
i)	<b>Reducing electrode</b>	<b>Oxidizing electrode</b>
	The cathode is the reducing electrode.	The anode is the oxidizing electrode.
ii)	<b>Nickel wire</b>	<b>Nickel sulphate solution</b>
	Electricity conducted due to movement of electrons.	Electricity conducted due to movement of ions.
iii)	<b>Calcium atom</b>	<b>Calcium ion</b>
	It is a neutral atom.	It has a positive charge.

b) i)      •  $C_nH_{2n+2}$       •  $n = \text{no. of c - atoms}$

•  $2n + 2 = \text{no. of H - atoms}$

ii) Alcohol

iii)



c) i) Silver chloride      ii) Dissociation

7. a) i) Forward reaction proceeds with decrease in volume.

ii) HCl is heavier than air.

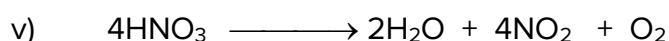
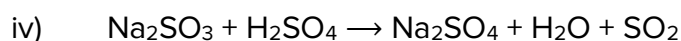
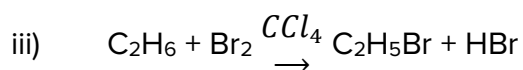
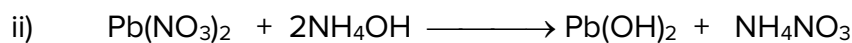
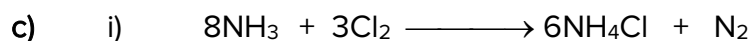
- iii) Nuclear charge of elements increases as well as non-metallic character increases.
- iv) Graphite anodes are oxidized to CO and CO<sub>2</sub>
- b) i) As antacid                      ii) As food preservative
- c) i) Fused alumina is a highly stable oxide and Al<sup>3+</sup> ion has strong affinity for oxygen.
- ii) A large amount of electrical energy is required to liberate Al from Al<sub>2</sub>O<sub>3</sub>.  
The liberated Al metal may tend to volatilize out.
- d) i) E has a larger atomic size than F
- ii) E

# CHEMISTRY

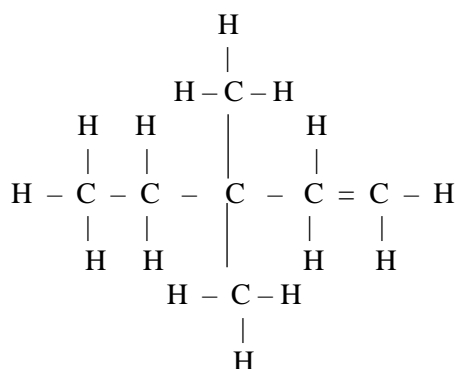
## Answer Key to Self-Assessment Sample Paper - 2

1. a) i) C                      ii) C                      iii) A                      iv) C                      v) A

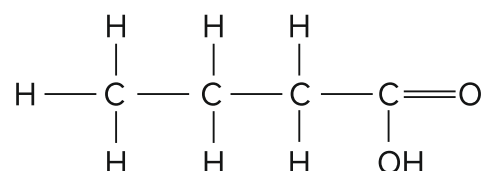
- b) i) White ppt. formed that gets dissolved.  
 ii) Pungent smelling gas formed that makes no change in calcium nitrate solution.  
 iii) Anode mass decreases.  
 iv) Pink colour gets decolourized.  
 v) Yellow residue is formed.

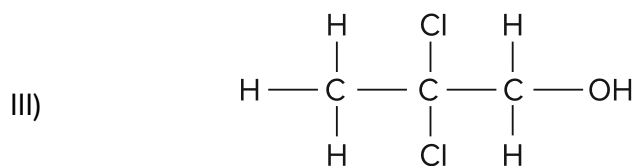


d) i)



ii)





ii) I) ethanal II) Ethane – 1, 2, – diol

- e) i) Lead bromide undergoes dissociation into  $\text{Pb}^{2+}$  and  $\text{Br}^-$  ions that conducts electricity.
- ii) Valences of carbon not satisfied by hydrogen bonding and electrons are available making them reactive.
- iii) Stable electronic configuration, reluctant to accept electrons.
- iv) Sodium chloride and silver nitrate in solution dissociates into free ions, undergoes fast reaction.
- v) Lead sulphide (black ppt.) is formed.

f) i)  $\text{AlPO}_4$  ii)  $\text{CH}_2$

g) i) Electronegativity ii) Hydrogenation iii) dehydration  
iv) Electroplating v) pH

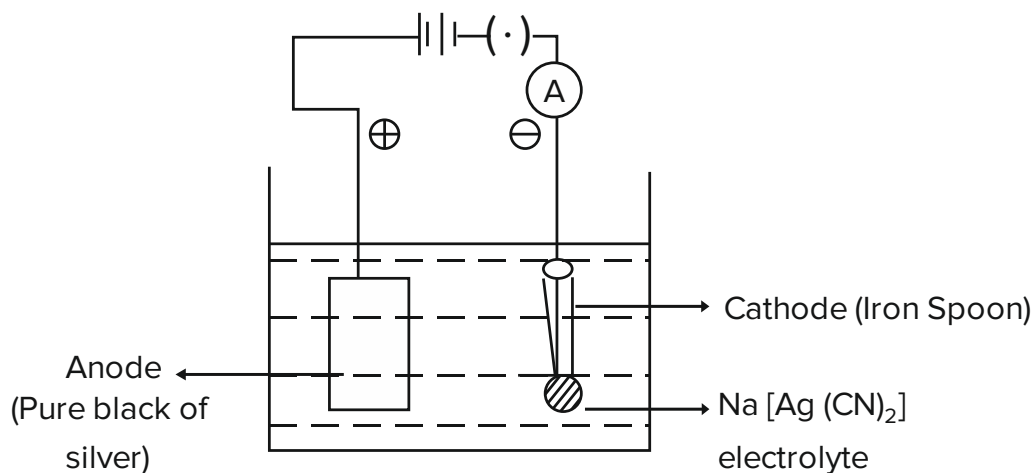
h) i)  $\text{NH}_3$  : air ii) 2 iii) ethene  
iv) smallest v) donors

2. a) i)  $\text{Z}_2(\text{SO}_4)_3$  ii) Ionic, Alkali iii) Helium iv) (2,8,7)

b) 1 – C, 2 – D, 3 – E, 4 – B, 5 – A

3. a)  $\text{C}_{12} \text{H}_{24} \text{O}_{12}$

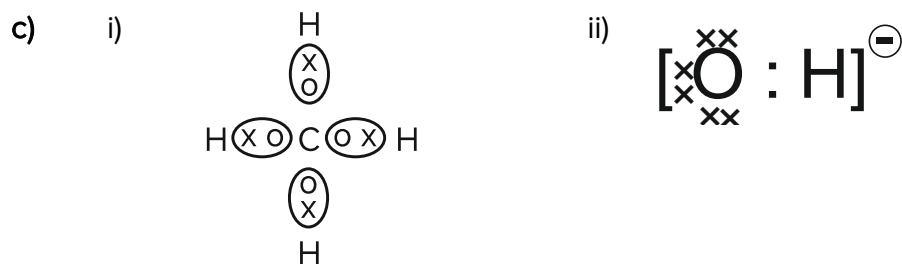
b) In the diagram mark the electrolyte as sodium argentocyanide



c) 1) Bauxite      ii) Cathode      iii)  $\text{Al}^{3+} + 3e \longrightarrow \text{Al}$

4. a) i) Lead      ii) nitric oxide  
 iii) conc. nitric acid      iv) Ethene  
 v) Sodium bisulphate

b) • Acidic      •  $\text{FeCl}_3 + 3\text{NaOH} \longrightarrow \text{Fe}(\text{OH})_3 + 3\text{NaCl}$



5. a) i) Aqueous copper sulphate  
 ii) Anode  $\rightarrow$  Impure copper block  
 iii)  $\text{Cu} - 2e \longrightarrow \text{Cu}^{2+}$



- b) (I) Ammonia (II) Barium sulphate (III) Ammonium sulphate
- i)  $(\text{NH}_4)_2\text{SO}_4 + 2\text{NaOH} \longrightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O} + 2\text{NH}_3$
- ii)  $(\text{NH}_4)_2\text{SO}_4 + \text{BaCl}_2 \longrightarrow 2\text{NH}_4\text{Cl} + \text{BaSO}_4$
- c) Anode
6. a) i) Haber's Process ii)  $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$
- ii) Exothermic, reversible
- iv) By dissolving the gases in water,  $\text{NH}_3$  dissolves but  $\text{N}_2$  and  $\text{H}_2$  remains undissolved.
- b)  $\text{C}_4\text{H}_{10}$
- c) i) Potassium ii) Silicon
7. a) i) Silver nitrate  $\longrightarrow$  Sodium chloride forms a white ppt. but not sodium nitrate.
- ii) Ammonium hydroxide  $\longrightarrow$  Zinc nitrate forms white ppt. that later becomes soluble.
- iii)  $\text{NaOH} / \text{Ca}(\text{OH})_2$  added + heated  $\longrightarrow$  Pungent smelling gas formed with ammonium chloride.
- b) i) Product  $\longrightarrow$  Ethanol
- ii) Product  $\longrightarrow$  Ethanal
- c) Sulphuric acid
- d) One-part conc nitric acid + three parts conc hydrochloric acid Gold/Platinum

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## Answer Key to Self-Assessment Sample Paper - 3

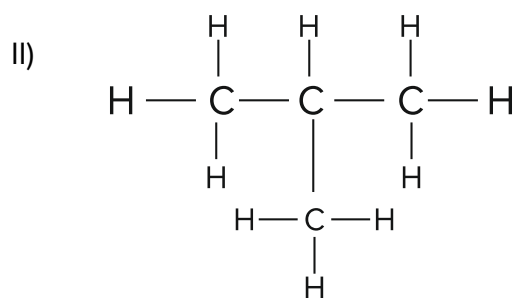
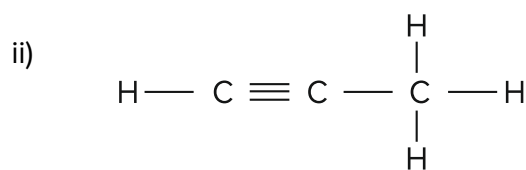
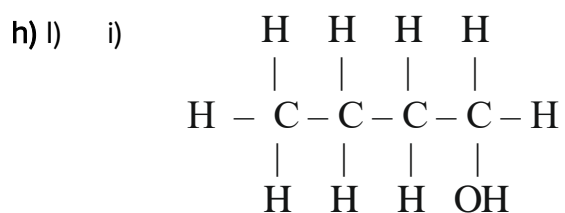
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1. a) i) B → Neon                      ii) A → Pure block of nickel  
       iii) B → Ethene                iv) C → Conc. sulphuric acid  
       v) A → Ethyl chloride
- b) i) Atomic size    ii) 1            iii) alkaline            iv) NO  
       v) Oxidizing
- c) i) Oxidation        ii) Ionization                      iii) Ionization potential  
       iv) Baeyer's reagent                      v) Vapor density
- d) i) A → Sodium hydroxide/NaOH  
       B → Hydrogen sulphide/H<sub>2</sub>S  
       C → Sulphuric acid/H<sub>2</sub>SO<sub>4</sub>
- ii) Empirical formula weight = 29  
       VD = 29            ∴ RMM = 2 × VD  
       ∴  $n = \frac{2 \times VD}{\text{Empirical formula weight}} = \frac{2 \times 29}{29} = 2$   
       ∴ Molecular formula = (C<sub>2</sub>H<sub>5</sub>)<sub>2</sub> = C<sub>4</sub>H<sub>10</sub>
- e) i) Colourless solution turns blue  
       ii) Pungent smelling gas evolved

- iii) Orange turns to yellow
- iv) Anode decreases in mass
- v) Blue substances turn black

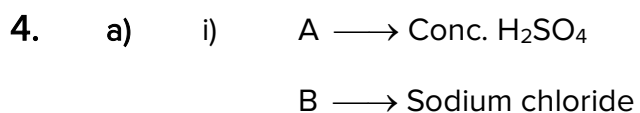
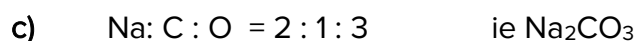
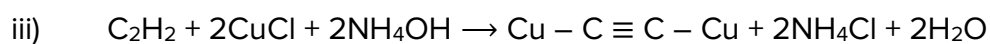
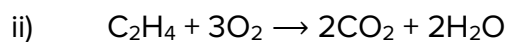
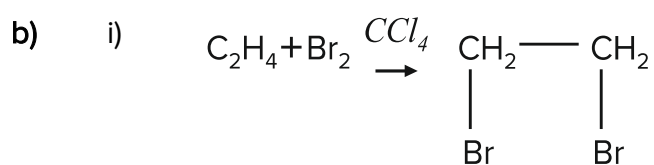
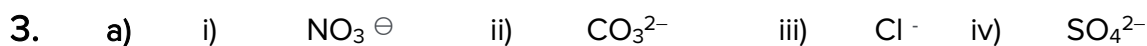
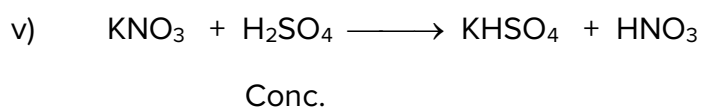
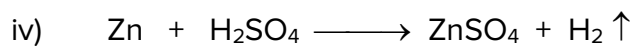
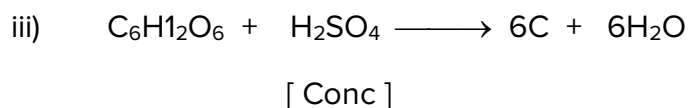
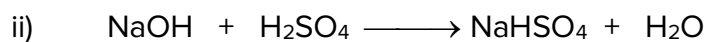
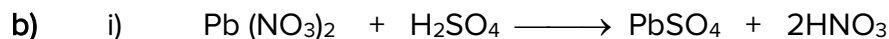
- f)
- i) Metals..... ionize with most difficulty are .....
  - ii) Sodium Argentocyanide solution is used.....
  - iii) Ammonia.....colourless Nessler's.....
  - iv) Cryolite and flourspar ..... from 2050° C to 950° C
  - v) The inverted funnel arrangement .....

- g)
- i) Nitrogen trichloride
  - ii) Ethyne
  - iii) Ferrous sulphate
  - iv) Silver oxide
  - v) Silver chloride



- II) i) 4 – Bromo – 4 – chloropentyne
- ii) 3 – Bromobutanone

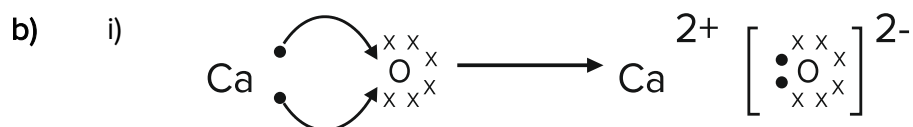
2. a) i) Na    ii) Cl    iii) SiH<sub>4</sub>    iv) Covalent



- ii)  $\text{NaCl} + \text{H}_2\text{SO}_4 \longrightarrow \text{NaHSO}_4 + \text{HCl}$
- iii) Glass rod dipped in  $\text{NH}_4\text{OH}$ , brought near  $\text{HCl}$  gas, dense white fumes formed.
- iv) Heavier than air.
- v) Conc. sulphuric acid is not shown as drying agent.

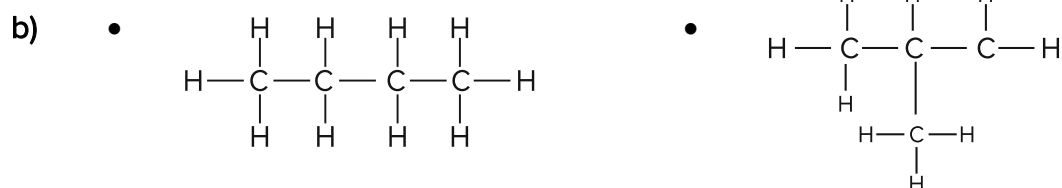
- b) i)  $\text{OH}^-$  ii)  $\text{Ca}^{2+}$  iii) Carbon iv) Ions

5. a) i)  $\text{FeSO}_4 + 2\text{NaOH} \longrightarrow \text{Fe}(\text{OH})_2 + \text{Na}_2\text{SO}_4$
- ii)  $\text{Pb}(\text{NO}_3)_2 + 2\text{NaOH} \longrightarrow \text{Pb}(\text{OH})_2 + 2\text{NaNO}_3$
- iii)  $\text{FeCl}_3 + 3\text{NaOH} \longrightarrow \text{Fe}(\text{OH})_3 + 3\text{NaCl}$
- iv)  $\text{CuSO}_4 + 2\text{NaOH} \longrightarrow \text{Cu}(\text{OH})_2 + \text{Na}_2\text{SO}_4$

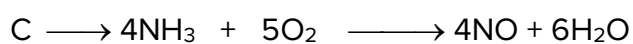
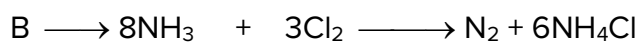
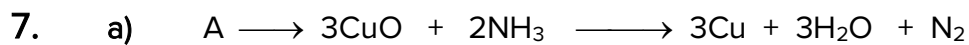


- c) On shaking the test tube the cone HSO may further mix with water & the heat evolved assists in decomposing the browning which is very unstable.

6. a) 1—C                      4—B
- 2—E                      5—A
- 3—D



- Structural isomerism
- Butane and 2 – methyl propane



b) i) 3, 3 – diethyl – 2 – methylpentane

ii) 3 - methylpropanol

iii) 2 – bromo – 5 – methylhex – 3 – yne

c) • Disodium biphosphate and sodium dihydrogen phosphate

•  $\text{Na}_3\text{PO}_4$

# CHEMISTRY

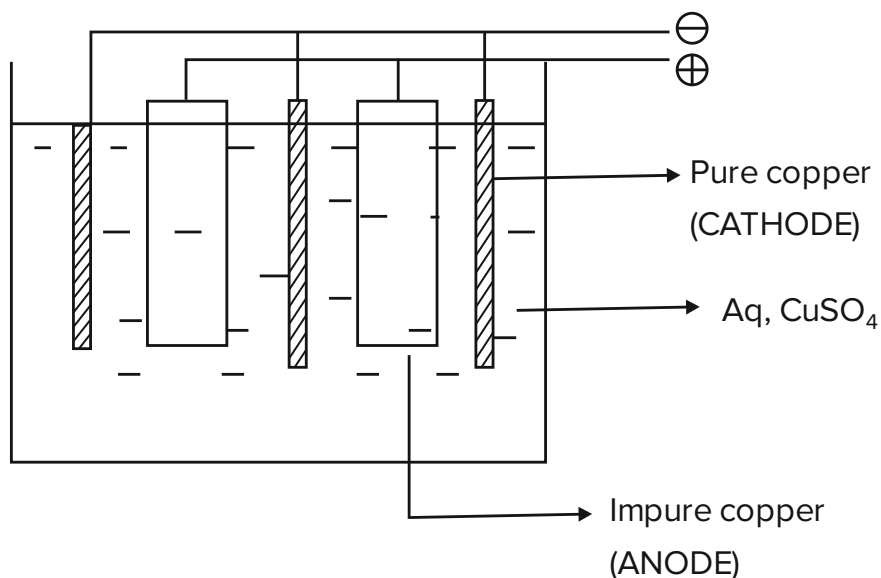
## Answer Key to Self-Assessment Sample Paper - 4

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1. a) i) A          ii) C          iii) B          iv) A          v) C
- b) i) Ethyne      ii) 1          iii) 7          iv) Electron affinity      v) Ammonia
- c) i) Pink colour turns colourless.  
 ii) Blue colour is decolourized  
 iii) Reddish brown colour is discharged.  
 iv) Reddish brown fumes evolved.  
 v) Reddish brown gas evolved / yellow residue formed from white substance.
- d) i)  $C_2H_6 + Br_2 \rightarrow C_2H_5Br$   
 ii)  $Na_2S + 2HCl \longrightarrow 2NaCl + H_2S$   
 iii)  $C + 4 HNO_3 \longrightarrow CO_2 + 2 H_2O + 4NO_2$   
 iv)  $PbO + 2HNO_3 \longrightarrow Pb(NO_3)_2 + H_2O$   
 v)  $Pb(NO_3)_2 + Na_2CO_3 \longrightarrow PbCO_3 + 2NaNO_3$
- e) i) A) 
$$\begin{array}{c} H & & & & H \\ | & & & & | \\ H - C - C \equiv C - C - H \\ | & & & & | \\ H & & & & H \end{array}$$
 B) 
$$\begin{array}{ccccccccc} & H & & H & & H & & H & & & \\ & | & & | & & | & & | & & & \\ H & - & C & - & C & - & C & - & C & - & C & - & H \\ & & | & & | & & | & & | & & || & & \\ & & H & & H & & & & Br & & O & & \\ & & & & & & & & & & & & \\ & & & & & & H - C - H & & & & & & \\ & & & & & & | & & & & & & \\ & & & & & & H & & & & & & \end{array}$$
- ii) 3,3 - dichlorobutane-2-one
- f) i) Metallic character decreases across the period.

- ii) Chlorine is more electronegative than hydrogen so attracts shared pair of electrons towards itself.
- iii) Carbon has unique properties like tetravalency, catenation & leading to formation of isomers.
- iv)  $P_2O_5$  is acidic drying agent which can react with ammonia.
- v) The strong affinity between  $Al^{3+}$  and  $O^{2-}$  ion makes the bond very stable.

g) i)



- Anode Mud

ii) Anode

h) Empirical formula =  $NaSH_5O_4$

Empirical formula weight = 124

$$n = \frac{248}{124} = 2$$

$$\begin{aligned} \therefore \text{Molecular formula} &= (NaSH_5O_4) \times 2 \\ &= Na_2S_2O_8 \cdot 5H_2O \end{aligned}$$

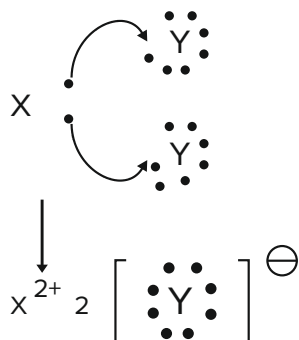
2. a) i) Both are in the third period



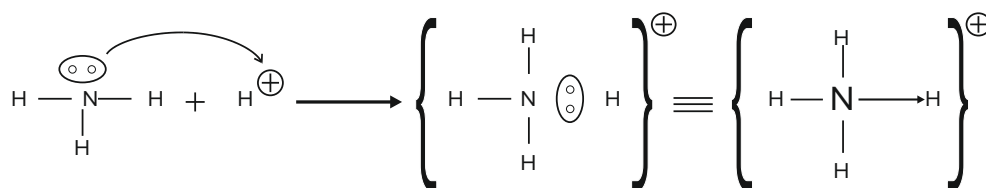
ii)  $XY_2$

iii) High Solubility

iv)



b)



No lone pair of electrons.

c) i) HCl      ii)  $CH_3COOH$

3. a) i) neutral      ii) ammonium hydroxide  
 iii) more than distil water / more than 7      iv) Electron affinity

b) i) Ion      ii) Molecule      iii) Molecules

c) i) As an eyewash      ii) As fertilizer      iii) As fuel

4. a) i) Ethane      ii) Methanol  
 iii) 1,2 dichloroethane

b) • High solubility of gas in water

- Acidic nature of the gas

c)  $RMM = 2 \times VD$  ; Let molecular formula be (CH)

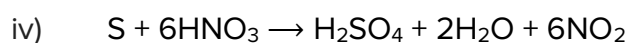
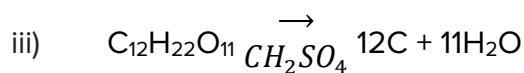
$$n = \frac{RMM}{\text{Empirical formula weight}} ; \text{ Empirical formula mass} = 13$$

$$\text{Acetylene} \longrightarrow n = \frac{26}{13} = 2 \longrightarrow \text{C}_2\text{H}_2$$

$$\text{Benzene} \longrightarrow n = \frac{78}{13} = 6 \longrightarrow \text{C}_6\text{H}_6$$

d)

<b>Alkane</b>	<b>Alkene</b>
• Undergoes substitution reaction	• Undergoes addition reaction
<b>Alkene</b>	<b>Alkyne</b>
• No characteristics observation	• White precipitate observed



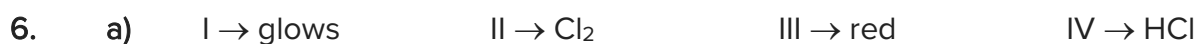
b) i) Monobasic acid has no replaceable H – atoms.

ii) The test tube when shaken released heat when conc  $\text{H}_2\text{SO}_4$  mix with water and breaks the ring.

iii) Carbon monoxide is formed and forms carboxyl hemoglobin.

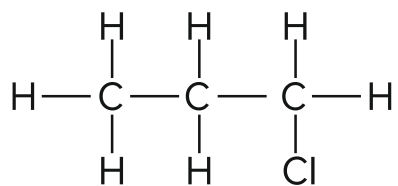
iv) Ammonia is a reducing agent.

v) Magnesium releases electron while oxygen accepts the electrons.



b) i) No      ii) Aldehydes      iii) ethanal      iv) Alcohols

c) Chloropropane



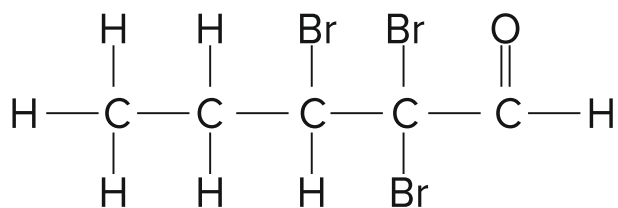
7. a) i) nickel      ii) dissociation      iii) Alkanes  
iv) smaller than      v) neutralization

b) i) Aluminium      ii) silver      iii) Boron      iv) Lithium

c) Conc. sulphuric acid



3.



- ii) 1) 3,3 – dichlorobutan – 2 – ol  
 2) 2 – bromobut – 2 – ene

- e) i) Inert gases have a stable electronic configuration.  
 ii) Zinc displaces hydrogen from dilute acid whereas conc. H<sub>2</sub>SO<sub>4</sub> has oxidizing property, so SO<sub>2</sub> is formed.  
 iii) Alkenes forms oily products on treatment with halogens.  
 iv) Hydrogen is formed only very dilute nitric acid as its oxidizing effect decreases.  
 v) Forms a constant boiling mixture / azeotropic mixture

- f) i) CH<sub>4</sub>  
 ii) CH<sub>3</sub> or C : H = 1 : 3

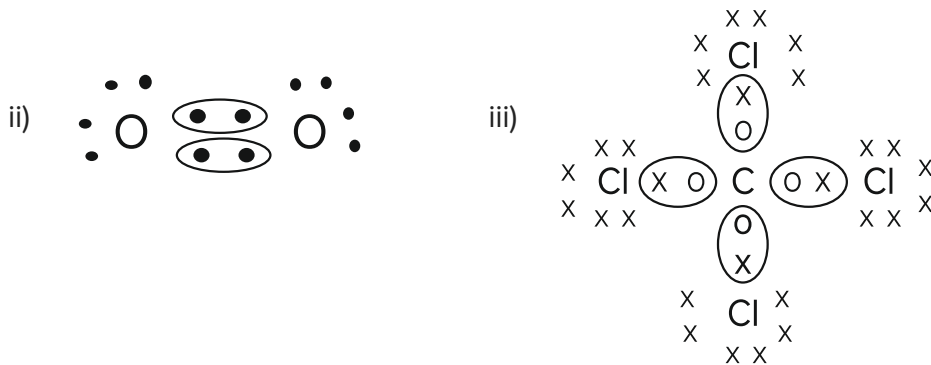
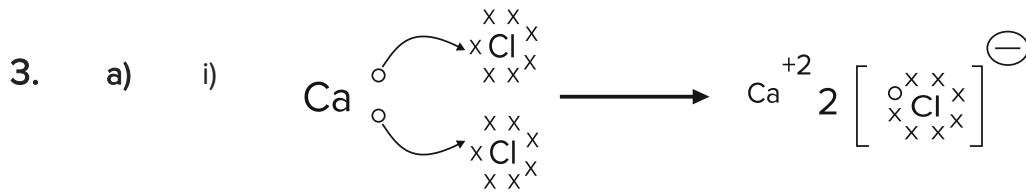
- g) i) Catenation                      ii) Thin strip of copper  
 iii) Covalent bond                  iv) Molecular mass  
 v) Diacidic base

- h) i) graphite                          ii) White                      iii) chlorine  
 iv) Ammonium nitrate              v) ionic

2. a) i) Ba                      ii) Be                      iii) 2                      iv) BaCl<sub>2</sub>                      v) Less

Metallic as metallic property decreases from left to right of the periodic table.

- b) I → acidic      II → hydrogen      III → salt  
 IV → universal



- b) 1—C      2—D      3—E      4—B      5—A

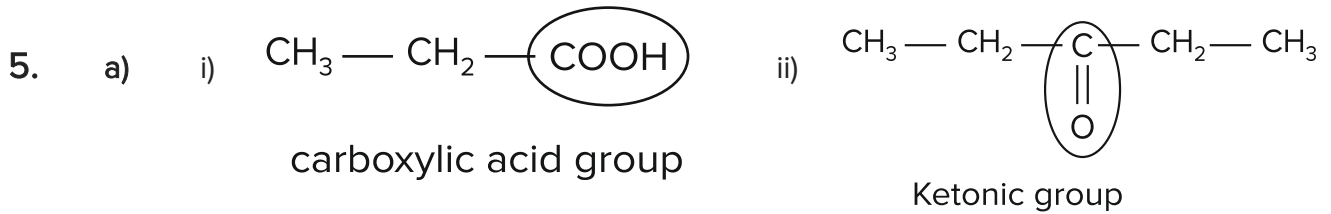
c)  $\text{RMM of CaF}_2 = 40 + (19 \times 2) = 78$

$\% \text{ of F} = \frac{19 \times 2}{78} \times 100 = 48.71\%$

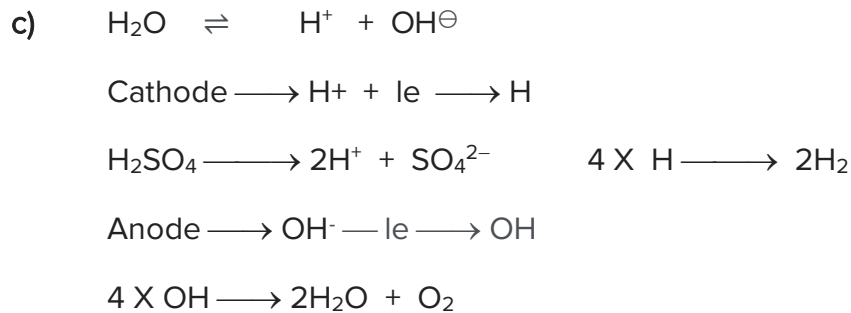
4. a) i) 700°C - 800°C      ii) Exothermic      iii) Platinum  
 iv) 450°C – 500°C      v) Exothermic      vi) Iron

b) It dissolved metallic oxide on the surface and thereby cleans it up.

c)  $\text{H}_2\text{SO}_4$  being heavier than water settles down and so the heat released spreads in bulk, so less spurting takes place but vice versa the heat released from surface spurts the acids.



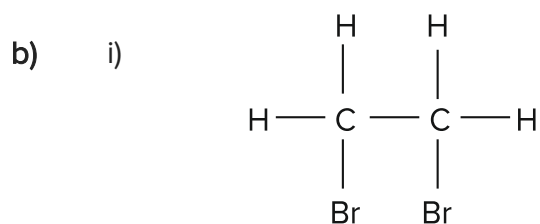
- b) i) Ferrous sulphate is oxidized to ferric sulphate which do not respond to ring test.
- ii) Water introduced in the beaker dissolves  $\text{NH}_3$  creating a low pressure. so, litmus moves upward to compensate the pressure difference created inside.
- iii) To maintain the temperature of the electrolytic mixture at  $950^\circ\text{C}$ .
- iv) Nuclear charge increases so pulls the electrons closer thus decreasing atomic radius.



6. a) i)  $\text{PbCl}_4$
- b) • Cation is formed by loss of electron from the valence shell.
- $\text{Cu}^{2+}$       •  $\text{Cu}^{2+} + 2\text{e}^- \longrightarrow \text{Cu}$
- c) i) Sodium sulphate decahydrate
- ii) Electron affinity
- iii) Manganese ion
- iv) Inverted funnel arrangement
- v) Aluminum ion

7. a) i) Ammonia      ii)  $2\text{NH}_4\text{Cl} + \text{Ca}(\text{OH})_2 \longrightarrow \text{CaCl}_2 + 2\text{H}_2\text{O} + 2\text{NH}_3$
- iii) • Quicklime  
• Conc.  $\text{H}_2\text{SO}_4$  if used will undergo chemical reaction to form  $(\text{NH}_4)_2\text{SO}_4$

iv) Colourless Nessler's reagent turns brown.



ii) Reddish brown colour gets discharged

iii) Addition

iv) Carbon dioxide

