

ICSE Board
Class X Chemistry
Sample Paper – 12 Solution

SECTION I

Answer 1

(a)

- i. It does not ionise.
- ii. Oxygen
- iii. It does not ionise in the solid form.
- iv. a. Reduced
b. Higher

(b)

- i. (A) Precipitation
- ii. (B) Metal + dilute acid or metallic carbonate + acid
- iii. (C) Metal + dilute acid
- iv. (D) Neutralisation
- v. (E) Neutralisation

(c)

- i. (a) Al and Cu
- ii. (a) NaCl
- iii. (a) Passing dry ammonia over heated copper oxide
- iv. (c) Substitution
- v. (a) He

(d)

- i.
 - a. A solution of bromine water or Baeyer's reagent is decolourised by ethene but not by alkane.
 - b. Both alkene and alkyne decolourise Baeyer's reagent but only ethyne forms a red precipitate with cuprous chloride.
- ii.
 - a. Lead fuses with platinum.
 - b. Aluminium alloys are used to make aircraft because these alloys are very light weight, strong and corrosion-resistant.
 - c. A glass container cannot accept metal as cathode ions. Moreover, the glass surface may react with the cations released.

(e)

- i. Sulphuric acid
- ii. Ammonium hydroxide and calcium hydroxide
- iii. Potassium gold cyanide
- iv. Butane (Isobutane)
- v. Aqua regia

(f)

- i. $3\text{CuO} + 2\text{NH}_3 \rightarrow 3\text{Cu} + 3\text{H}_2\text{O} + \text{N}_2$
- ii. $\text{NaCl} + \text{H}_2\text{SO}_4 \rightarrow \text{NaHSO}_4 + \text{HCl}$
- iii. $2\text{FeCl}_2 + \text{Cl}_2 \rightarrow 2\text{FeCl}_3$
- iv. $2\text{NH}_4\text{Cl} + \text{Ca}(\text{OH})_2 \rightarrow \text{CaCl}_2 + 2\text{H}_2\text{O} + 2\text{NH}_3$
- v. $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$

(g)

- i.
 - a. Sodium or magnesium
 - b. Sulphur or chlorine
 - c. Silicon
- ii.
 - a. Ionisation energy
 - b. Electron affinity

(h)

- i. Aluminium
- ii. Roasting occurs in the presence of oxygen, while calcination occurs in the absence of oxygen. Roasting is the heating of ore at a temperature below its melting point, while calcination is the heating of ore at a temperature insufficient to melt the ore.
- iii. Froth flotation process
- iv. Iron ore is haematite $[\text{Fe}_2\text{O}_3]$; aluminium ore is bauxite $[\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}]$.
- v. Molten mixture of pure alumina and cryolite $[\text{Al}_2\text{O}_3 + \text{Na}_3\text{AlF}_6]$. Some fluorspar $[\text{CaF}_2]$ is also added to the mixture.

SECTION II

Answer 2

(a)

- i. Hydrogen chloride is denser. This gas is collected by the upward displacement of air.
- ii. Ammonia and hydrogen chloride react to produce ammonium chloride.



(b)

- i. $2\text{NH}_3 + 3\text{CuO} \rightarrow 3\text{Cu} + 3\text{H}_2\text{O} + \text{N}_2$
- ii. $8\text{NH}_3 + 3\text{Cl}_2 \rightarrow 6\text{NH}_4\text{Cl} + \text{N}_2$

(c)

- i. A = Concentrated sulphuric acid
B = Sodium nitrate
C = Nitric acid
- ii. $4\text{HNO}_3 \rightarrow 2\text{H}_2\text{O} + 4\text{NO}_2 + \text{O}_2$
- iii. $\text{Cu} + 4\text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{H}_2\text{O} + 2\text{NO}_2$

Answer 3

(a)

Element	% by mass	Relative no. of atoms	Simple ratio
C	4.8	$\frac{4.8}{12} = 0.4$	$\frac{0.4}{0.4} = 1$
Br	95.2	$\frac{95.2}{80} = 1.19$	$\frac{1.19}{0.4} = 2.975 = 3$

Empirical formula = CBr_3

- ii. Vapour density = 252
Molecular mass = $252 \times 2 = 504$

Empirical formula mass = $12 + 80 \times 3 = 252$

$$n = \frac{\text{Mol. wt}}{\text{Emp. formula wt}} = \frac{504}{252} = 2$$

Molecular formula = $n(\text{EF}) = 2(\text{CBr}_3) = \text{C}_2\text{Br}_6$

- iii. X can be prepared by a substitution reaction.

(b)

Salt	Anion
1. A	Chloride (Cl ⁻)
2. B	Sulphide (S ²⁻)
3. C	Nitrate (NO ₃ ⁻)
4. D	Sulphite (SO ₃ ²⁻)
5. E	Carbonate (CO ₃ ²⁻)

Answer 4

(a)

- i. Nickel
- ii. Acetic acid
- iii. Esterification
- iv. $C_2H_4Br_2 \rightarrow C_2H_2 + 2KBr + 2H_2O$
- v. Ethanol

(b)

- i. $C_2H_5Cl + KOH \rightarrow C_2H_5OH + KCl$
- ii. $CH_3COONa + NaOH \xrightarrow[300^\circ C]{CaO} CH_4 + Na_2CO_3$
- iii. $2C_2H_5OH \xrightarrow[O]{K_2Cr_2O_7} 2CH_3COOH + H_2O$
- iv. $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$
- v. $2C_2H_5OH + 2Na \rightarrow 2C_2H_5ONa + H_2$

Answer 5

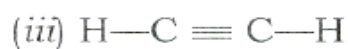
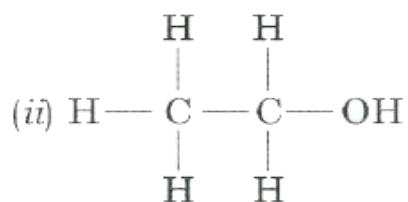
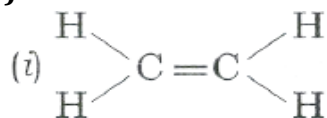
(a)

- i. NaOH molecular weight = 40
40 g of NaOH = 1 mole
160 g of NaOH = 4 mole
- ii. 18 g of H₂O = 1 gm molecule
 $\therefore 45 \text{ g} = \frac{1}{18} \times 45 = 2.5 \text{ gm mol}$
- iii. Water (density = 1)

(b)

- i. $C + 4HNO_3 \rightarrow CO_2 + 4NO_2 + H_2O$
- ii. $ZnO + 2HNO_3 \rightarrow Zn(NO_3)_2 + H_2O$
- iii. $FeS + H_2SO_4 \rightarrow FeSO_4 + H_2S$

(c)



Answer 6

(a)

- i. It has a lower melting point.
- ii. It is light and strong.
- iii. It is strong and non-corrosive.
- iv. It is tough and non-corrosive.
- v. It is looks like gold and cheap.

(b)

- i. Basic oxide (MgO)
- ii. Neutral oxide (H₂O)
- iii. Acidic oxide (P₂O₅)

(c)

- i. Hydrogen chloride and it is an acidic gas.
 $2NaCl + 2H_2SO_4 \rightarrow Na_2SO_4 + 2HCl$
- ii. Chlorine gas
 $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

Answer 7

(a)

- i. The first period has 2 elements and the 2nd and 3rd periods have 8 elements.
- ii. These have 8 electrons in the outermost shell, i.e. the octet is complete.
- iii. Non-metals
- iv. 2⁻

(b)

- i. Washing soda
- ii. Copper (II) chloride
- iii. Anhydrous calcium chloride
- iv. Concentrated sulphuric acid
- v. Phosphorous pentoxide

- (c)**
1. Copper
 2. Copper