ICSE Board
Class X Chemistry
Sample Paper – 9 Solution

SECTION I

Answer 1

(a)

i. Acetylene or ethyne
ii. Hydrogen sulphide
iii. Calcium sulphite
iv. Sulphur
v. Type metal

(b)

i. $Pb(NO_3)_2 + H_2SO_{4(dil.)} \rightarrow PbSO_4 + 2HNO_3$
Lead nitrate; Sulphuric acid; Lead sulphate; Nitric acid

ii. $C_2H_5OH \xrightarrow[160^0C]{Conc.H_2SO_4} C_2H_4 + H_2O$
Ethyl alcohol; Ethene; Water

iii. $Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2$
Sodium carbonate; Hydrochloric acid; Sodium chloride; Water; Carbon dioxide

iv. $Cu + 2H_2SO_4 \rightarrow CuSO_4 + 2H_2O + SO_2$
Copper; Sulphuric acid; Copper sulphate; Water; Sulphur dioxide

v. $Pb(NO_3)_2 + 2NaCl \rightarrow PbCl_2 + 2NaNO_3$
Lead nitrate; Sodium chloride; Lead chloride; Sodium nitrate

(c)

i. Ethane
ii. Ethane
iii. Ethene
iv. Methane
v. Acetaldehyde

(d) 1. (i) decreases (ii) increases
2. (iii) decreases (iv) increases
3. (v) decreases (vi) increases
4. (vii) increases (viii) decreases
5. (ix) increases (x) decreases

(e)

i. Metallic character increases as we move down the group. Metallic character decreases as we move across a period.
ii. (1) Alkali
(2) Reducing
(3) Halogens
(4) Oxidising
iii. (1) Groups (2) Periods

(f)

i. b (Carbon)
ii. d (Zinc)
iii. d (Concentrated hydrochloric acid [3 parts] and concentrated nitric acid [1 part])
iv. d(Acetic acid)
v. b (Ethanol)

(g)

i.	Duralumin	(b) Aircraft frames
ii.	Brass	(a) Shell of ammunition rounds
iii.	Bronze	(d) Coins
iv.	Solder	(c) Joining electrical circuits
v.	Magnalium	(f) Scientific instruments
vi.	Stainless steel	(e) Cutlery

(h)

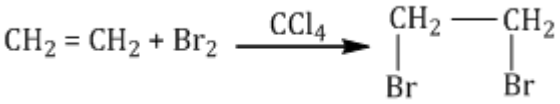
i. Molten ionic compound: B – strong electrolyte
ii. Carbon tetrachloride: A – non-electrolyte
iii. Aluminium wire: D – metallic conductor
iv. A solution containing solvent molecules, solute molecules and ions formed by dissociation of solute molecules: C – weak electrolyte
v. A sugar solution with sugar molecules and water molecules: A – non-electrolyte

Answer 2

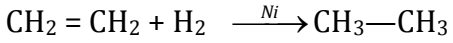
(a)

i. Ethene
ii. Unsaturated
iii. CnH_2n
iv. Colourless
v. Addition
vi. Ethane
vii. Nickel

(b)



Ethene 1, 2-dibromoethane



Ethene Ethane

(c) The presence of a double bond.

Answer 3

(a)

i. 2 moles of $Ca(NO_3)_2 \equiv 4$ moles of NO_2
1 mole of $Ca(NO_3)_2 \equiv 2$ moles of NO_2
Hence, the answer is 2 moles.

ii. 2 moles of $Ca(NO_3)_2 \equiv 1$ mole of O_2
328 g of $Ca(NO_3)_2 \equiv 22.4$ dm^3 of O_2

$$65.6 \text{ g of } Ca(NO_3)_2 \equiv \frac{22.4}{328} \times 65.6 \text{ } dm_3 \text{ of } O_2 \equiv 4.48 \text{ } dm_3 \text{ of } O_2$$

iii. 2 moles of $Ca(NO_3)_2 \equiv 2$ moles of CaO
328 g of $Ca(NO_3)_2 \equiv 112$ g of CaO

$$65.6 \text{ g of } Ca(NO_3)_2 \equiv \frac{112}{328} \times 65.6 \text{ g of CaO} \equiv 22.4 \text{ g of CaO}$$

iv. 2 moles of $Ca(NO_3)_2 \equiv 5$ moles of gaseous product
2 ×164 g of $Ca(NO_3)_2 \equiv 5$ moles of gaseous product
328 g of $Ca(NO_3)_2 \equiv 5$ moles of gaseous product

v. 2 moles of $Ca(NO_3)_2 \equiv 4$ moles of NO_2
328 g of $Ca(NO_3)_2 \equiv 4 \times 22.4$ L of NO_2

$$44.8 \text{ L of } NO_2 \equiv \frac{328}{89.6} \times 44.8 \text{ of } Ca(NO_3)_2 \equiv 164 \text{ g of } Ca(NO_3)_2$$

(b)

i. An alkaline gas A which gives dense white fumes with hydrogen chloride: **Ammonia**
ii. A dilute acid B which does not normally give hydrogen when reacted with metals but gives a gas when it reacts with copper: **Nitric acid**
iii. Gas C has an offensive smell like rotten eggs: **Hydrogen sulphide**
iv. Gas D is a colourless gas which can be used as a bleaching agent: **Sulphur dioxide**
v. Liquid E can be dehydrated to produce ethene: **Ethyl alcohol**

Answer 4

(a)

Cathode	Anode
i. Lead metal	Bromine vapour
ii. Hydrogen	Oxygen
iii. Copper	Oxygen
iv. Sodium	Chlorine
v. Potassium	Chlorine

(b) Molar mass of $AgNO_3$ = 108 + 14 + 48

= 170 g

Molar mass of AgCl = 108 + 35.5

= 143.5 g

143.5 g of AgCl was precipitated by 170 g of $AgNO_3$.

287 g of AgCl will be precipitated by $\frac{170}{143.5} \times 287$

= 340 g of $AgNO_3$

(c) Empirical formula mass of CH_2O = 12 + 2 + 16

= 30

$$n = \frac{\text{molecular mass}}{\text{Empirical formula mass}}$$

$$= \frac{180}{30}$$

= 6

Molecular formula = $(CH_2O)_6$

= $C_6H_{12}O_6$

Answer 5

(a)

i. A
ii. C
iii. B

(b)

i. **Mole:** A mole is defined as the amount (mass) of a substance containing elementary particles such as atoms, molecules or ions equal to Avogadro's number, i.e. 6.022×10^{23}.

ii. **Isomerism:** Compounds which are represented by the same molecular formulae but different structural formulae are called isomers, and the phenomenon is known as isomerism. Isomers have different properties because of the difference in the arrangement of their atoms.

iii. **Catenation:** The unique ability of a carbon atom to combine with other carbon atoms (self-linking) to form long chains by sharing their valence electrons is called catenation.

iv. **Homologous series:** It is defined as a group of organic compounds having a similar structure and similar chemical properties in which the successive compounds differ by a CH_2 group.

(c)

i. Colourless
ii. Pink
iii. Red

Answer 6

(a)

Metal	Ore	Process by which it is concentrated
i. Aluminium	Bauxite $Al_2O_3.2H_2O$	Baeyer's process or Hall's process
ii. Zinc	Zinc blende ZnS	Froth flotation process
iii. Iron	Haematite Fe_2O_3	Electromagnetic separation

(b)

i. $2Al(OH)_3 \xrightarrow{\Delta} Al_2O_3 + 3H_2O$

ii. $ZnO + C \longrightarrow Zn + CO$

(c)

i. The major purpose is to convert the ore to its oxide.

ii. Zinc sulphide is concentrated by roasting.
Zinc carbonate is concentrated by calcination.

Answer 7

(a)

i. Haber's process

$$N_2 + 3H_2 \underset{450\text{-}500^0\,C}{\overset{Fe\text{-}Mo}{\rightleftharpoons}} 2NH_3 + heat$$

$$200\text{-}1000atm$$

ii. Extreme solubility and basic nature

(b)

i. Silver nitrate
ii. Mercuric nitrate

(c)

i. Neutralisation
ii. Precipitation
iii. Direct combination

(d) Soluble salt – Neutralisation
Insoluble – Precipitation