# ICSE Board
# Class X Chemistry
# Sample Paper - 9

**Time: 2 hrs** **Total Marks: 80**

**General Instructions:**

- Answers to this paper must be written on the paper provided separately.
- You will not be allowed to write during the first 15 minutes.
- This time is to be spent in reading the question paper.
- The time given at the head of this paper is the time allowed for writing the answers.

**Section I** is compulsory.
Attempt any four questions from **Section II**.
The intended marks for questions or parts of questions are given in brackets [ ].

## SECTION I (40 Marks)

*Attempt **all** questions from this section.*

**Question 1**

**(a)** Name the following: [5]

i. An organic gas which forms red precipitate with Fehling's solution.
ii. A gas having rotten egg smell.
iii. An insoluble salt obtained when sulphur dioxide is passed through lime water.
iv. Essential product formed when hydrogen sulphide solution reacts with an oxidising agent.
v. An alloy which expands on cooling.

**(b)** Write balanced chemical equations for the following: [5]

i. Dilute sulphuric acid is added to lead nitrate solution.
ii. Dehydration of ethyl alcohol by concentrated sulphuric acid.
iii. Sodium chloride from sodium carbonate solution and dilute hydrochloric acid.
iv. Copper sulphate from copper and concentrated sulphuric acid.
v. Lead chloride from lead nitrate solution and sodium chloride solution.

**(c)** Write the name of the product formed during the following reactions. [5]

i. $C_2H_5COONa + NaOH \xrightarrow{CaO}$
ii. $C_2H_5I + 2[H] \longrightarrow$
iii. $C_2H_5OH \xrightarrow{Al_2O_3}$
iv. $Al_4C_3 + H_2O \longrightarrow$
v. $C_2H_2 + H_2O \longrightarrow$

**(d)** Copy and complete the following table showing the trends of the various periodic properties. [5]

| Periodic property | Group | Period |
|---|---|---|
| i. Ionisation energy | i. _____ | i. _____ |
| ii. Electron affinity | ii. _____ | ii. _____ |
| iii. Electronegativity | iii. _____ | iii. _____ |
| iv. Atomic size | iv. _____ | iv. _____ |
| v. Reducing property | v. _____ | v. _____ |

**(e)** [5]

i. How does the metallic character vary in group and period?

ii. Elements of Group 1 are called (1) _____ metals. These are good (2) _____ agents, whereas elements of Group 17 are called (3) _____. These are good (4) _____agents.

iii. The vertical columns are called (1) _____. The horizontal rows are called (2) _____.

**(f)** Choose the correct answer from the options given below: [5]

i. This non-metal has an allotropic form which conducts electricity.
(a) Sulphur
(b) Carbon
(c) Chlorine
(d) Iodine

ii. The metal whose hydroxide is soluble in NaOH solution is
(a) Calcium
(b) Magnesium
(c) Iron
(d) Zinc

iii. *Aqua regia* is a mixture of
(a) Dilute hydrochloric acid and concentrated nitric acid
(b) Concentrated hydrochloric acid and dilute nitric acid
(c) Concentrated hydrochloric acid [1 part] and concentrated nitric acid [3 parts]
(d) Concentrated hydrochloric acid [3 parts] and concentrated nitric acid [1 part]

iv. The aqueous solution of the following compounds which contain both ions and molecules is
(a) Sulphuric acid
(b) Hydrochloric acid
(c) Nitric acid
(d) Acetic acid

v. The organic compound obtained as the end-product of the fermentation of sugar solution is
(a) Methanol
(b) Ethanol
(c) Ethane
(d) Methanoic acid

**(g)** Match the following: [5]

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

**(h)** Choose A, B, C or D to match the descriptions (i) to (v) below. Some letters may be repeated. [5]

(A) Non-electrolyte
(B) Strong electrolyte
(C) Weak electrolyte
(D) Metallic conductor

i. Molten ionic compound
ii. Carbon tetrachloride
iii. Aluminium wire
iv. A solution containing solvent molecules, solute molecules and ions formed by the dissociation of solute molecules.
v. A sugar solution with sugar molecules and water molecules.

## SECTION II (40 Marks)

*Attempt **any four** questions from this section.*

**Question 2**

**(a)** Choose from the list only: [7]

Ethyne, Ethane, Ethene, Nickel, Copper, Saturated, $C_nH_{2n-2}$, $C_nH_{2n+2}$, Unsaturated, Saturated, Fehling's solution, Red, Colourless, Addition

i. $CH_2=CH_2$ is (i) _____. It is (ii) _____hydrocarbon having the general formula (iii) _____. Ethene reacts with the solution of bromine in carbon tetrachloride to give (iv) _____ solution, and it undergoes (v) _____reaction. Addition of hydrogen to $CH_2=CH_2$ yields (vi) _____ in the presence of (vii) _____ as a catalyst.

**(b)**

i. Give the balanced chemical equation for the reaction in the above question. [2]

ii. What special feature in $CH_2=CH_2$ helps to bring about the change of bromine solution in carbon tetrachloride? [1]

**Question 3**

**(a)** The equation for the action of heat on calcium nitrate is [5]

$2Ca(NO_3)_2 \rightarrow 2CaO + 4NO_2\uparrow + O2\uparrow$

i. How many moles of $NO_2$ are produced when 1 mole of $Ca(NO_3)_2$ decomposes?
ii. What volume of $O_2$ at STP will be produced on heating 65.6 g of $Ca(NO_3)_2$?
iii. Find out the mass of CaO formed when 65.6 g of $Ca(NO_3)_2$ is heated.
iv. Find out the mass of $Ca(NO_3)_2$ required to produce 5 moles of gaseous products.
v. Find out the mass of $Ca(NO_3)_2$ required to produce 44.8 L of $NO_2$ at STP.
[Relative molecular mass of $Ca(NO_3)_2$ = 164 and CaO = 56]

**(b)** Identify the following substances: [5]

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

**Question 4**

**(a)** Name the products obtained at the cathode and at the anode during the electrolysis of [5]

i. Molten lead bromide (inert electrode)
ii. Aqueous solution of sodium chloride (inert electrodes)
iii. Copper sulphate solution (inert electrodes)
iv. Molten sodium chloride
v. Molten potassium chloride

**(b)** $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$

How many grams of silver nitrate are required to precipitate 287 g of silver chloride? (N = 14, O = 16, Cl = 35.5, Ag = 108) [3]

**(c)** If a compound has empirical formula $CH_2O$ and its molecular mass is 180, then calculate its molecular formula. [2]

**Question 5**

**(a)** Three solutions A, B and C have pH 1, 6 and 13, respectively. [3]

i. Which solution is strongly acidic?
ii. Which solution is strongly alkaline?
iii. The solution which contains both ions as well as molecules.

**(b)** Define the following terms: [4]

i. Mole
ii. Isomerism
iii. Catenation
iv. Homologous series

**(c)** Mention the colour change observed when the following indicators are added to acids: [3]

i. Alkaline phenolphthalein solution
ii. Methyl orange solution
iii. Neutral litmus solution

**Question 6**

**(a)** [6]

(i) Name the most common ore of aluminium, zinc and iron.
(ii) Name the processes by which the named ores are concentrated.

**(b)** Give balanced chemical equations for the following: [2]

i. Aluminium hydroxide is heated.
ii. Zinc oxide is reduced.

**(c)**

i. What is the major purpose of subjecting concentrated ore to either roasting or calcination?
ii. Name the ores of zinc which are concentrated by roasting and calcination.

[2]

**Question 7**

**(a)** [3]

i. Name the property by which ammonia is prepared from its elements. Write the equation.

ii. Which property of ammonia is demonstrated by the fountain experiment?

**(b)** Name two metallic nitrates which, on heating, give the respective metal, $NO_2$ and oxygen. [2]

**(c)** Name the method by which the following compounds can be prepared:

Select the appropriate method from the following list.

Neutralisation; direct combination; precipitation; metal + acid (use a method only once)

i. Sodium sulphate

ii. Silver chloride

iii. Iron sulphide [3]

**(d)** Name a suitable method by which you could prepare a soluble salt like sodium chloride and an insoluble salt like lead sulphate. [2]