Date: 11/03/2026

Question Paper Code

T26 522

Aakash

Medical | IIT-JEE | Foundations

Corporate Office **:** AESL, 3rd Floor, Incuspaze Campus-2, Plot-13, Sector-18, Udyog Vihar, Gurugram, Haryana-122015

Time: 2 Hrs.

CHEMISTRY

Max. Marks: 80

(Science Paper 2)

ICSE Board Class X Exam (2026)

Answers & Solutions

GENERAL INSTRUCTIONS

Read the following instructions very carefully and follow them:

(i) Duration for the Test is 2 hours.

(ii) Maximum Marks for Section-**A** and **B** is 40 each.

(iii) The intended marks for questions or parts of questions are given in brackets [ ].

(iv) **Section A** is compulsory. Attempt **all** questions from this section.

(v) Attempt **any four** questions from **Section B**.

(vi) Use of calculator is not permitted.

(vii) It is mandatory to use Blue/Black ballpoint pen to write the answers on the paper provided separately.

SECTION-A (40 Marks)

*(Attempt **all** questions from this Section.)*

Choose the correct answers to the questions from the given options. **[15]**

(Do not copy the questions, write the correct answers only.)

1. (i) A non-metal which reacts with concentrated sulphuric acid to form two gases which turn lime water milky is _____.

(a) Sulphur (b) Carbon
(c) Oxygen (d) Nitrogen

Answer (b) **[1]**

Hint & Sol.: $C + 2H_2SO_4(conc.) \rightarrow CO_2 + 2SO_2 + 2H_2O$

(ii) Which of the following element pairs will form an ionic bond?

Pair	
P	Elements of Group 1 & Group 2
Q	Elements of Group 14 & Group 16
R	Elements of Group 2 & Group 17
S	Elements of Group 15 & Group 18

(a) P (b) Q
(c) R (d) S

Answer (c) **[1]**

Hint & Sol.: Group 2 elements = Metals

Group 17 elements = Non-metals

(iii) The electronic configuration of an element is 2, 8, 2. The hydroxide of this element can produce _____ hydroxyl ions per molecule.

(a) 3 (b) 2
(c) 1 (d) 0

Answer (b) **[1]**

Hint & Sol.: $Mg(OH)_2$

(iv) With respect to the electrolysis of copper (II) sulphate solution using copper electrodes, which statement is correct?

(a) Copper metal is deposited at the negative electrode.
(b) Oxygen gas is produced at the positive electrode.
(c) The positive electrode increases in mass.
(d) The negative electrode decreases in mass.

Answer (a) **[1]**

Hint & Sol.: At cathode : $Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$

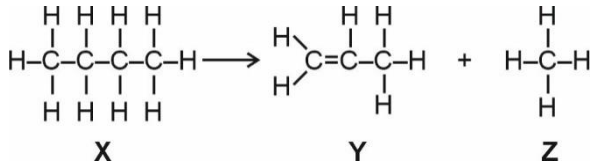
(v) Identify the equation that shows the reaction of ethane with chlorine in the presence of ultraviolet light.

(a) $C_2H_6 + Cl_2 \rightarrow C_2H_6Cl_2$ (b) $C_2H_6 + Cl_2 \rightarrow C_2H_4Cl_2 + H_2$
(c) $C_2H_6 + Cl_2 \rightarrow C_2H_5Cl + HCl$ (d) $C_2H_6 + Cl_2 \rightarrow 2CH_3Cl$

Answer (c) **[1]**

Hint & Sol.: $C_2H_6 + Cl_2 \rightarrow C_2H_5Cl + HCl$

(vi) A hydrocarbon **X** undergoes the reaction under suitable conditions as shown below:



Which compound(s) is/are unsaturated?

(a) X only (b) Y only

(c) X and Z (d) Y and Z

Answer (b) **[1]**

Hint & Sol.: Compound 'Y' contains double bond.

(vii) Rita added dilute hydrochloric acid to four metals. She recorded her observations in the table given below. While noting her observations she made some errors.

	Metals	Observations
1	copper	a gas was given off
2	iron	a gas was given off
3	magnesium	no gas was given off
4	zinc	a gas was given off

Which observation(s) made by Rita is/are **correct**?

(a) 1 only (b) 3 only

(c) Both 1 and 4 (d) Both 2 and 4

Answer (d) **[1]**

Hint & Sol.: Cu + HCl (dil) $\rightarrow$ No reaction

Mg + 2HCl (dil) $\rightarrow$ $MgCl_2 + H_2$

(viii) An atom of **X** forms an ion according to the equation $\mathbf{X \rightarrow X^{+2}}$.

The atomic number of the atom **X** is:

(a) 16 (b) 10

(c) 12 (d) 14

Answer (c) **[1]**

Hint & Sol.: $_{12}X$ = 2, 8, 2

X^{+2} = 2, 8

(ix) Salts can be prepared by the action of dilute acid on:

1. Bases
2. Carbonates
3. Metals
4. Sulphites

The method which **cannot** be used for the preparation of copper salts is:

(a) 1 (b) 2

(c) 3 (d) 4

Answer (c) **[1]**

Hint & Sol.: Generally copper does not react with dilute acids.

(x) The compound that has the **highest** melting point amongst the following is:

(a) Methane (b) Sodium chloride

(c) Ammonia (d) Ethanol

Answer (b) **[1]**

Hint & Sol.: Sodium chloride is an ionic compound.

(xi) **Assertion (A):** Dilute Sulphuric acid is a stronger electrolyte than concentrated

Reason (R): Dilute Sulphuric acid has a higher concentration of mobile ions.

(a) (A) is true but (R) is false.

(b) (A) is false but (R) is true.

(c) Both (A) and (R) are true and (R) is the correct explanation of (A).

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

Answer (c) **[1]**

Hint & Sol.: The concentration of mobile ions is an acid, increases on dilution in water.

(xii) What volume of carbon dioxide is produced at STP when 5 litres of propane is burnt completely according to the equation given below?

$$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$$

(a) 10 litres (b) 15 litres

(c) 20 litres (d) 25 litres

Answer (b) **[1]**

Hint & Sol.: $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

$\because$ 1 V of C_3H_8 gives 3 V of CO_2

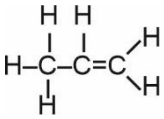
$\therefore$ 5 L of C_3H_8 gives 15 L of CO_2

(xiii) An unsaturated hydrocarbon with three atoms of carbon and six atoms of hydrogen is:

(a) Propyne (b) Propane

(c) Propene (d) Propanol

Answer (c) **[1]**

Hint & Sol.: 

(xiv) **Assertion (A):** In the electrolysis of acidified water, the volume of hydrogen liberated is twice the volume of oxygen formed.

Reason (R): Water has hydrogen and oxygen in the ratio of 1 : 2 by volume.

(a) (A) is true but (R) is false.

(b) (A) is false but (R) is true.

(c) Both (A) and (R) are true and (R) is the correct explanation of (A).

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

Answer (a) **[1]**

Hint & Sol.: Water has hydrogen and oxygen in the ratio of 2 : 1 by volume.

(xv) In the electrolysis of molten aluminium oxide for extraction of aluminium, the following reactions take place:

1. $Al^{3} + 3e^{-} \rightarrow Al$
2. $2O^{2-} + O_2 \rightarrow 4e^{-}$
3. $C + O_2 \rightarrow CO_2$
4. $Al_2O_3 \rightleftharpoons 2Al^{3+} + 3O^{2-}$

The reaction that takes place at the negative electrode is:

(a) 1 (b) 2

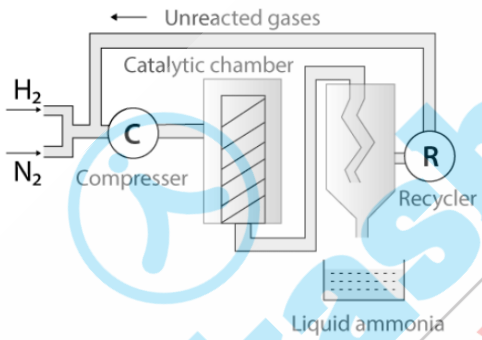
(c) 3 (d) 4

Answer (a) **[1]**

Hint & Sol.: At cathode : $Al^{3+} + 3e^{-} \rightarrow Al$

2. (i) Given below is the industrial process for the manufacture of **ammonia** gas. **[5]**

Study the schematic diagram to answer the following questions.



(a) Name the process.

(b) Which catalyst is used in the above process?

(c) In the above diagrammatic setup, how is ammonia gas separated from the unreacted gases to obtain liquid ammonia?

(d) Which **two** properties of ammonia gas can be demonstrated by the *Fountain Experiment*?

(ii) Identify the following **terms / compounds**: **[5]**

(a) A compound which reacts with water to give acetylene gas.

(b) The gas evolved when sodium propanoate is heated with soda lime.

(c) A reddish-brown precipitate formed when ferric chloride solution reacts with an alkali.

(d) A pair of electrons present in an atom which is not shared with any other atom during bond formation.

(e) The relative molecular mass of a substance expressed in grams.

(iii) Match **Column A** with **Column B**: **[5]**

Column A		Column B	
(a)	$CuO + C \rightarrow Cu + CO$	1.	Oxidation
(b)	$Al^{3+} + 3e^{-} \rightarrow Al$	2.	Ionization
(c)	$PbBr_2 \rightarrow Pb^{2+} + 2Br^{1-}$	3.	Reduction
(d)	$2O^{2-} - 2e^{-} \rightarrow O_2$	4.	Redox
(e)	$HCl \rightarrow H^{+} + Cl^{1-}$	5.	Electrolytic dissociation

(iv) Complete the following sentences by choosing the *correct option* from the brackets: **[5]**

(a) The oxide that dissolves in caustic potash (KOH) is _____. [*ZnO/CuO*]

(b) The reaction that takes place at the anode during the electrolysis of molten lead bromide is _____. [$2Br - 2e^- \rightarrow 2Br^-$ / $2Br^- - 2e^- \rightarrow Br_2$]

(c) The volume occupied by 8 grams of oxygen gas at STP is _____ litres. [*5.6/8.96*] [Atomic weight of O = 16]

(d) _____ **does not** give hydrogen was when it reacts with cold and very dilute nitric acid. [*Cu/Mn*]

(e) _____ is a polar covalent compound. [HCl/CCl_4]

(v) (a) Give the IUPAC name for the following organic compounds: **[5]**

1. $HO - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

2. $H_3C - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

(b) Draw the structural diagram for each of the following organic compounds:

1. butanal
2. pent-2-yne
3. The isomer of n-butane

Sol. (i) (a) Haber's process **[1]**

(b) Finely divided iron **[1]**

(c) Ammonia is separated by liquefaction in water as NH_3 is highly soluble in water as compared to N_2 and H_2. **[1]**

(d) (I) High solubility of NH_3 in water. **[1]**

(II) Basic nature of NH_3. **[1]**

(ii) (a) CaC_2 (Calcium carbide) **[1]**

$CaC_2 + H_2O \rightarrow Ca(OH)_2 + C_2H_2$

(b) C_2H_6 (ethane) **[1]**

$CH_3CH_2COONa + NaOH \xrightarrow{CaO,\Delta} C_2H_6 + Na_2CO_3$ **[1]**

(c) $Fe(OH)_3$ (iron (III) hydroxide)

$FeCl_3(aq) + NaOH(aq) \rightarrow Fe(OH)_3(s) + NaCl\ (aq)$

(d) Lone pair of electrons **[1]**

(e) Gram molecular mass. **[1]**

(iii) **[1 × 5 = 5]**

(a)	$CuO + C \rightarrow Cu + CO$	4.	Redox
(b)	$Al^{3+} + 3e^- \rightarrow Al$	3.	Reduction
(c)	$PbBr_2 \rightarrow Pb^{2+} + 2Br^{1-}$	5.	Electrolytic dissociation
(d)	$2O^{2-} - 2e^- \rightarrow O_2$	2.	Oxidation
(e)	$HCl \rightarrow H^+ + Cl^{1-}$	1.	Ionization

(iv) (a) ZnO **[1]**

(b) $2Br^- - 2e^- \rightarrow Br_2$ **[1]**

(c) 5.6 **[1]**

Hint: Volume of 32 g O_2 at STP = 22.4 litres

Volume of 8 g O_2 at STP = $\frac{22.4 \text{ litres}}{32}$

= 5.6 litres

(d) Cu **[1]**

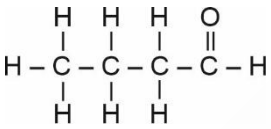
Hint: $3Cu(s) + 8HNO_3(aq) \rightarrow 3Cu(NO_3)_2(aq) + 2NO(g) + 4H_2O(l)$

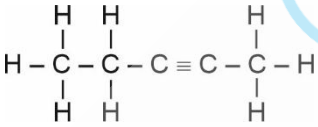
(e) HCl **[1]**

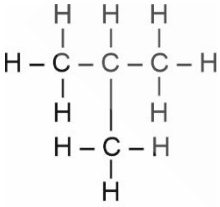
Hint: $\overset{\delta^+}{H} - \overset{\delta^-}{Cl}$

(v) (a) (1) Butan-2-ol **[1]**

(2) 3-methyl pentane **[1]**

(b) (1)  **[1]**

(2)  **[1]**

(3)  **[1]**

iso-butane

SECTION-B (40 Marks)

*(Attempt **any four** questions from this Section.)*

3. (i) Alex was given a solution of an unknown salt **Y** for analysis. He performed the following tests and recorded his observations: **[2]**

- To a part of the solution **Y**, he added silver nitrate solution and obtained a white precipitate which was soluble in ammonium hydroxide solution.
- To the remaining solution he added a few drops of sodium hydroxide solution and obtained a pale blue precipitate.

Based on the observations made by Alex, identify:

(a) the anion and

(b) the cation present in salt **Y**.

(ii) Study the reaction given below and answer the questions that follow: **[2]**

$$NaNO_3 + \underset{\text{Conc.}}{H_2SO_4} \xrightarrow{<200°C} NaHSO_4 + HNO_3$$

(a) Give one reason for maintaining the temperature below 200°C.

(b) Why is concentrated Sulphuric acid used in the above reaction?

(iii) Element **A** belongs to group 15 and period 2 of the Periodic Table. **[3]**

(a) Identify the element **A**.

(b) Write the formula of the compound formed when element A combines with hydrogen.

(c) Draw the dot (•) and cross (x) structure of the compound formed in (b) above.

(iv) Complete and balance the following equations: **[3]**

(a) $C_2H_4Br_2 + \underset{\text{(alcoholic)}}{KOH} \longrightarrow$

(b) $NH_3(\text{excess}) + Cl_2 \longrightarrow$

(c) $C_{12}H_{22}O_{11} \xrightarrow{(\text{conc.})H_2SO_4}$

Sol. (i) Salt **Y** is $CuCl_2$.

(a) Anion present in salt **Y** is Cl^- **[1]**

(b) Cation present in salt **Y** is Cu^{2+} **[1]**

(ii) (a) The higher temperature

(i) may damage the glass apparatus

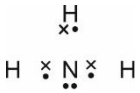
(ii) decomposition of nitric acid can occur,

(iii) wastage of fuel **(any one) [1]**

(b) Because it is a non-volatile acid that displaces nitric acid from nitrates. **[1]**

(iii) (a) Element A is nitrogen (N). **[1]**

(b) NH_3 **[1]**

(c)  **[1]**

(iv) (a) $C_2H_4Br_2 + \underset{\text{(alcoholic)}}{2KOH} \xrightarrow[\text{boiling}]{200°C} C_2H_2 + 2KBr + 2H_2O$ **[1]**

(b) $8NH_3(\text{excess}) + 3Cl_2 \longrightarrow N_2 + 6NH_4Cl$ **[1]**

(c) $C_{12}H_{22}O_{11} \xrightarrow{(\text{conc.})H_2SO_4} 12C(s) + 11H_2O$ **[1]**

4. (i) Differentiate between the following pairs based on the criteria given in the bracket: **[2]**

(a) Acetic acid and Sulphuric acid (*number of replaceable hydrogen ion per molecule*)

(b) Electrolyte and Metallic conductor (*the particles conducting electricity*)

(ii) Equal volumes of ammonia gas and chlorine gas are kept in two different containers under the same conditions of temperature and pressure. **[2]**

Find the number of molecules contained in chlorine gas when the mass of ammonia is 34 g.

[*Atomic weight: Cl = 35.5 H = 1, N = 14*]

(iii) Elements **P**, **Q**, and **R** are in the same period of the modern periodic table. **[3]**

- **P** readily loses its one valence electron to form a stable ion.
- **Q** shares its electrons in bonding but does not form ions easily.
- **R** has high electronegativity.

Answer the following questions based on the above information:

(a) Which element would be most difficult to reduce among **P**, **Q** and **R**?

(b) Which element is expected to have the smallest atomic radius among **P**, **Q** and **R**?

(c) Arrange **P**, **Q** and **R** in order of decreasing ionization potential.

(iv) Given below are some chemicals. **[3]**

Lead nitrate, Copper, Hydrochloric acid, Lead oxide, Iron, Sodium carbonate, Copper carbonate, Chlorine

Using suitable chemicals from the box given above, write balanced chemical equations for the preparation of the following salts.

(**Note:** The chemicals may be used more than once, if needed.)

(a) Lead (II) carbonate

(b) Copper (II) chloride

(c) Iron (II) chloride

Sol. (i) (a) Actic acid (CH_3COOH) has only one replaceable hydrogen ion while sulphuric acid (H_2SO_4) have two replacable hydrogen ions **[1]**

(b) In metallic conductors current carrying particles are electrons while in electrolyte current carrying particles are ions which are bulky bodies compared to electrons **[1]**

(ii) Molar mass of ammonia (NH_3) = 17 g **[0.5]**

Moles of ammonia (NH_3) = $\frac{34g}{17g} = 2$ **[0.5]**

Hence moles of chlorine = 2 **[0.5]**

Number of molecules of chlorine = $2 \times 6.022 \times 10^{23}$

$= 1.2044 \times 10^{24}$ **[0.5]**

(iii) (a) P **[1]**

(b) R **[1]**

(c) R > Q > P **[1]**

(iv) (a) $Pb(NO_3)_{2(aq)} + Na_2CO_{3(aq)} \rightarrow PbCO_{3(s)} + 2NaNO_{3(aq)}$ **[1]**

(b) $CuCO_{3(s)} + 2HCl_{(aq)} \rightarrow CuCl_{2(aq)} + H_2O_{(l)} + CO_{2(g)}$ **[1]**

(c) $Fe_{(s)} + 2HCl_{(aq)} \rightarrow FeCl_{2(aq)} + H_{2(g)}$ **[1]**

5. (i) An **unsaturated** hydrocarbon having **two** carbon atoms was made to react with **two** moles of hydrogen gas in the presence of a catalyst to give a saturated hydrocarbon. **[3]**

Using the above information, answer the following questions:

(a) The type of reaction that occurred is _____. (*addition/substitution*)

(b) Name a suitable catalyst which is used in the reaction.

(c) Write a balanced chemical equation for the above reaction.

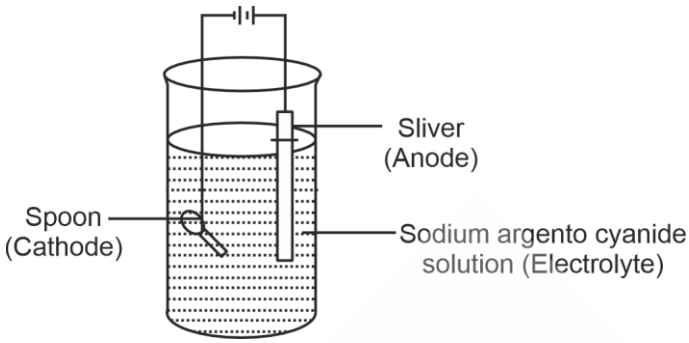
(ii) During the manufacture of sulphuric acid, a chemist collected the gas formed after catalytic oxidation of sulphur dioxide. **[3]**

(a) Name the gas collected.

(b) Which acid is formed when the gas collected by the chemist is dissolved directly in water?

(c) Why should we not dissolve this gas directly in water?

(iii) The diagram given below shows the electroplating of a spoon with silver. With reference to the diagram, answer the following questions: **[4]**



(a) Write an equation for the reaction that occurs at the cathode.

(b) Silver nitrate solution is not preferred as an electrolyte in the above process.
Give a reason.

(c) Why is alternating current not used in the process?

(d) What is the observation at the anode?

Sol. (i) (a) Addition **[1]**

(b) Nickel/platinum **[1]**

(c) $CH \equiv CH + 2H_2 \xrightarrow{Ni/pt} CH_3 - CH_3$ **[1]**

(ii) (a) Sulphur trioxide **[1]**

(b) Sulphuric acid **[1]**

(c) Sulphur troixide should not dissolve directly into water because the reaction is highly exothermic and generated heat vaporizes the water and the acid, creating a thick, dense mist of tiny sulphuric acid droplets **[1]**

(iii) (a) $\underset{\text{(from electrolyte)}}{Ag^+} + e^- \rightarrow Ag$ **[1]**

(b) If silver nitrate solution is used directly the deposition of silver will be very fast and hence not very smooth and uniform. **[1]**

(c) Alternating current causes discharge and ionisation to alternate at the cathode thus giving no effective coating **[1]**

(d) Anode continuously dissolves as ions in solution and thickness of anode decreases. **[1]**

6. (i) Give reasons why: **[2]**

(a) Hydrochloric acid cannot form an acid salt.

(b) Electronegativity increases across a period.

(ii) State whether the following statements are **True or False**: **[2]**

(a) Organic compounds having different molecular formula, but same structural formula are called isomers.

(b) A salt is a compound formed by partial or complete replacement of the hydrogen ion of an acid by a metal or electro positive ion.

(iii) Anil is a laboratory assistant in a college. He prepared nitric acid but stored it in a transparent container exposed to sunlight. After a few days, brown fumes were observed in the container and the acid turned slightly yellowish in colour. **[3]**

(a) What was the error made by Anil while storing the acid?

(b) Why were brown fumes observed in the container?

(c) How can the yellowish tinge in the acid be removed?

(iv) $Zn + 4HNO_3 \longrightarrow Zn(NO_3)_2 + 2H_2O + 2NO_2$ **[3]**

32.5 g of zinc reacts with concentrated nitric acid as given in the above equation.

(a) How many moles of zinc was required in the reaction?

(b) Find the mass of nitric acid needed to react with 32.5 g of zinc.

(c) Find the volume of nitrogen dioxide liberated in (b).

[*Atomic weight*: H = 1, N = 14, O = 16, Zn = 65]

Sol. (i) (a) HCl is a strong acid, so its conjugate base Cl^- is very weak and does not hydrolyze; therefore, salts of HCl are neutral, not acidic. **[1]**

(b) Electronegativity increases across a period because nuclear charge increases while shielding remains almost constant, so atoms attract bonding electrons more strongly. **[1]**

(ii) (a) False **[1]**

(b) True **[1]**

(iii) (a) Anil stored it in a transparent container and exposed it to sunlight whereas nitric acid should be stored in a dark, tightly closed container away from sunlight. **[1]**

(b) Nitric acid decomposes on exposure to sunlight and evolve brown fumes of NO_2 gas. **[1]**

(c) The yellowish tinge in the acid is because of dissolved NO_2 gas. By the addition of excess water, NO_2 gas dissolves in water and thus yellow colour of the acid is removed. **[1]**

Or

If dry air or CO_2 is bubbled through the yellow acid, the latter turns colourless because it drives out NO_2 gas from warm acid which is further oxidised to nitric acid.

(iv) (a) Number of moles of Zn = $\frac{\text{Given mass}}{\text{Molar mass}}$

$= \frac{32.5}{65} = 0.5$ mol **[1]**

(b) From the given balanced equation,

1 mole of Zn require 4 moles of HNO_3

0.5 mole of Zn will require 4 × 0.5 = 2 moles of HNO_3

Mass = moles × molar mass

Mass of HNO_3 = 2 × 63 = 126 g **[1]**

(c) Moles of NO_2 produced = 0.5 × 2 = 1 mole

Volume of NO_2 = 1 mole × 22.4 L/mol = 22.4 L **[1]**

7. (i) Carbon reacts with an acid to form carbon dioxide, water and nitrogen dioxide. **[2]**

(a) Name the acid used in the reaction.

(b) Write a balanced chemical equation for the reaction that occurs.

(ii) Bauxite is the principal ore used in the commercial extraction of aluminium. The Bayer's process is used to refine bauxite into pure alumina, with caustic soda playing a crucial role in the initial stage of the process. **[2]**

Based on this, answer the following questions:

(a) Explain the reason behind the addition of caustic soda during the Bayer's process.

(b) Write a balanced chemical equation representing the reaction between bauxite and caustic soda during the Bayer's process.

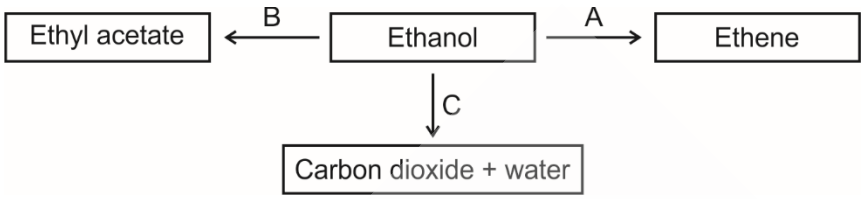
(iii) Give one relevant observation for the following: **[3]**

(a) Sodium hydroxide is added dropwise to Calcium nitrate solution.

(b) Dilute Hydrochloric acid is added to Iron (II) sulphide.

(c) An amphoteric metal is added to hot concentrated alkali.

(iv) Study the reaction scheme shown below and identify the reactants A, B and C. **[3]**



Sol. (i) (a) Concentrated nitric acid (HNO_3) **[1]**

(b) $C + 4HNO_3 \rightarrow CO_2 + 2H_2O + 4NO_2$ **[1]**

(ii) (a) Concentrated caustic soda dissolves the aluminium oxide in bauxite to form soluble sodium meta-aluminate because of the amphoteric nature of aluminium leaving behind insoluble impurities called red mud. Red mud consists of ferric oxide, sand, etc. which are removed by filteration, effectively purifying the ores. **[1]**

(b) $Al_2O_3 \cdot 2H_2O + 2NaOH \rightarrow 2NaAlO_2 + 3H_2O$ **[1]**

(iii) (a) On adding sodium hydroxide to calcium nitrate solution dropwise, a white precipitate of calcium hydroxide is formed. **[1]**

(b) Black colour of iron sulphide disappears and a distinct, foul smell of rotten eggs is observed due to evolution of H_2S gas. **[1]**

(c) The metal dissolves with brisk effervescence and a colorless, odorless gas (hygrogen gas) is evolved that burns with a pop sound. **[1]**

(iv) A is conc. H_2SO_4 **[1]**

B is ethanoic acid **[1]**

C is O_2 **[1]**

8. (i) 5.6 litrs of gas **Z** weighs 32 g at STP. What is the molecular weight and vapour density of Z? **[2]**

(ii) Name of following: **[2]**

(a) The most electronegative element of Period 2.

(b) The largest atom of Period 3.

(iii) Given below are a few elements. **[3]**

Li, K, Ca, F

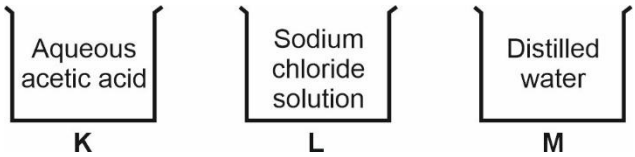
Identify the element which:

(a) Has the least atomic radius.

(b) Has two valence electrons.

(c) Is the most electropositive.

(iv) **K**, **L** and **M** are beakers containing three different solutions as shown below. **[3]**



Name the beaker which:

(a) Contains only ions.

(b) Contains only molecules.

(c) Has pH less than 7.

Sol. (i) Moles of gas $Z = \frac{\text{Volume}}{\text{Molar volume}} = \frac{5.6}{22.4} = \frac{1}{4} = 0.25$ moles

Molecular weight $(M) = \frac{\text{Mass}}{\text{Moles}} = \frac{32}{0.25} = 128$ g **[1]**

Vapor density $= \frac{\text{Molecular weight}}{2} = \frac{128}{2} = 64$ **[1]**

(ii) (a) Fluorine (F) **[1]**

(b) Sodium (Na) **[1]**

(iii) (a) F **[1]**

(b) Ca **[1]**

(c) K **[1]**

(iv) (a) L **[1]**

(b) M **[1]**

(c) K **[1]**

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