

Chemical Reactions
and Equations

(Chapter 1)

DIFFICULTY LEVEL

MEDIUM

10Qs

45 min.

Note: (1) Topic names and solutions of each Question are available via QR code
 (2) Mark ✓ or ✗ on the Question circle, after attempting.

- 1.** Which of the following is/are an endothermic process(es)?

- (I) Dilution of sulphuric acid
- (III) Condensation of water vapours
- (IV) Evaporation of water

Options:

- (a) (I) and (III)
- (b) Only (II)
- (c) Only (III)
- (d) (II) and (IV)

[Understand] (1m)

- 2.** Reema took 5 mL of lead nitrate solution in a beaker and added approximately 4 mL of potassium iodide solution to it. What would she observe?

- (a) The solution turned red.
- (b) Yellow precipitate was formed.
- (c) White precipitate was formed.
- (d) The reaction mixture became hot. [Analyse] (1m)

- 3.** On heating a blue coloured powder of copper (II) nitrate in a boiling tube, a black substance X, oxygen gas and a brown gas Y was formed. Select the option which identifies the products correctly:

| | Black Substance (X) | Brown Gas (Y) |
|-----|---------------------|------------------|
| (a) | Copper | Nitrogen dioxide |
| (b) | Copper oxide | Nitrogen oxide |
| (c) | Copper oxide | Nitrogen dioxide |
| (d) | Copper | Nitrogen oxide |

[Analyse] (1m)

- 4.** The given question consist of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

Assertion (A): A white washed wall develops a coating of calcium carbonate after a few days.

Reason (R): Calcium hydroxide on the wall reacts slowly with carbon dioxide in the air.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

[Understand] (1m)

- 5.** Hydrogen being a highly inflammable gas and oxygen being a supporter of combustion, yet water, a compound made up of hydrogen and oxygen is used to extinguish fire. Why? [Analyse] (2m)

- 6.** What can be seen when a strip of copper metal is placed in a solution of silver nitrate? [Apply] (2m)

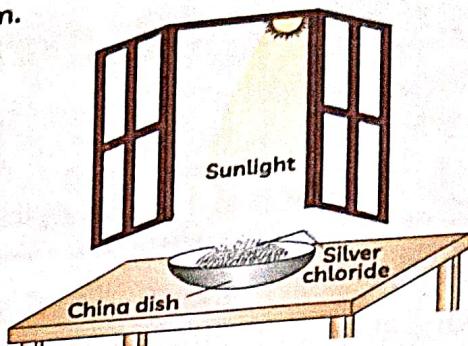
- 7.** (A) Identify the reducing agent in the following reactions:

- (i) $4\text{NH}_3 + 5\text{O}_2 \rightarrow 4\text{NO} + 6\text{H}_2\text{O}$
- (ii) $\text{H}_2\text{O} + \text{F}_2 \rightarrow \text{HF} + \text{HOF}$
- (iii) $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$
- (iv) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

- (B) Define a redox reaction in terms of gain or loss of oxygen.

[Analyse]
 [Understand] (3m)

8. To demonstrate a chemical reaction, Zafar took 2 g of silver chloride in a china dish and placed in sunlight as shown in the diagram.



Answer the following questions based on the above activity:

(A) What will Zafar observe after some time?

(B) What is this reaction known as?

(C) Write the balanced chemical equation for this reaction. Give reason for the observation.

[Analyse]
[Understand]

[Apply] (3m)

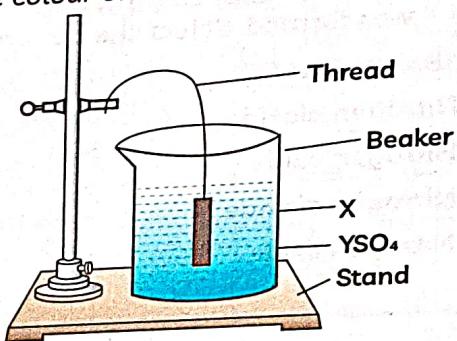
9. Give characteristic tests for the following gases:

(A) CO_2
(C) O_2

(B) SO_2
(D) H_2

[Apply] (5m)

10. Divya set up an experiment in her chemistry lab as shown in the figure below on the basis of what her teacher told. She observed the blue colour of the solution fades away.



[Analyse] (1m)

(A) What would be 'X' and 'Y'?

(B) Name the metal salt YSO_4 . What type of reaction takes place between X and YSO_4 ?

[Analyse] (1m)

(C) Write the balanced chemical equation along with the states of the reactants and products. What will be observed when 'X' reacts with YSO_4 ?

[Apply]

OR

(C) Write the balanced equation when 'X' reacts with the nitrate salt of 'Y'? Will there be a change in colour in this reaction?

[Evaluate] (2m)



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2

UNIT TEST WORKSHEET

**DIFFICULTY LEVEL
HARD**



10Qs

⌚ 50 min.

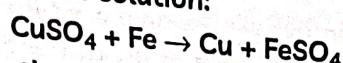
EduCart

Chemical Reactions and Equations

(Chapter 1)

Note: (1) Topic names and solutions of each Question are available via QR code
 (2) Mark ✓ or ✗ on the Question circle, after attempting.

1. In the reaction of iron with copper sulphate solution:



Which option in the given table correctly represents the substance oxidised and the reducing agent?

| | Substance Oxidised | Reducing Agent |
|-----|--------------------|-----------------|
| (a) | Fe | Fe |
| (b) | Fe | FeSO_4 |
| (c) | Cu | Fe |
| (d) | CuSO_4 | Fe |

[Understand] (1m)

2. Which of the following statements about the reaction given below are correct?



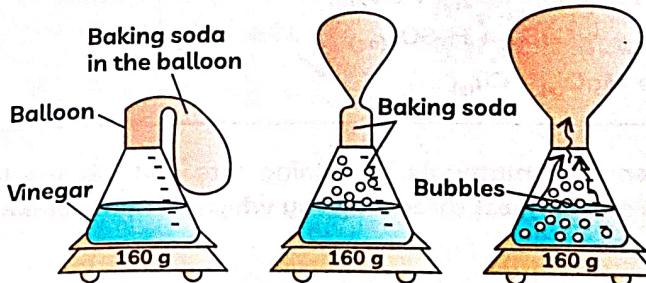
- (I) HCl is oxidised to Cl_2
- (II) MnO_2 is reduced to MnCl_2
- (III) MnCl_2 acts as an oxidising agent
- (IV) HCl acts as an oxidising agent

Options:

- (a) (II), (III) and (IV)
- (b) (I), (II) and (III)
- (c) (I) and (II) only
- (d) (III) and (IV) only

[Evaluate] (1m)

3. Ramsha poured 100 mL of water in a bottle and added 40 mL vinegar to it. A balloon was filled with 20 g baking soda and was fixed at the mouth of the bottle. Slowly, the shape of the balloon changed, as shown. Ramsha claims that a chemical change has taken place when the two substances were mixed. Is the claim made by her correct?



- (a) Yes, as a new substance was formed in the form of a gas.
- (b) Yes, as the mass remains the same throughout the experiment.
- (c) No, as the formation of bubbles in the mixture shows a physical change.
- (d) No, as the change in the shape and size of the balloon shows a physical change.

[Analyse] (1m)

- 4.** The given question consists of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

Assertion (A): Copper sulphate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) turns from blue to white, as it is heated and this indicates the removal of water of crystallisation.

Reason (R): Only the physical state of the water molecules confined within the salt crystal structure is impacted by heating copper sulphate pentahydrate; its chemical makeup remains unchanged.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

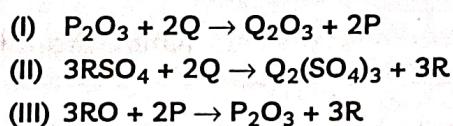
[Analyse] (1m)

- 5.** A magnesium ribbon is burnt in oxygen to give a white compound X accompanied by emission of light. If the burning ribbon is now placed in an atmosphere of nitrogen, it continues to burn and forms a compound Y.

- (A) Write the chemical formulae of X and Y.
(B) Write a balanced chemical equation for X when it is dissolved in water.

[Apply] (2m)

- 6.** P, Q and R are three elements which undergo chemical reactions according to the following equations:



Answer the following:

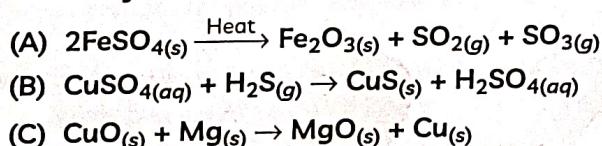
- (A) Identify the most reactive and least reactive element.
(B) State the types of reactions listed above.

[Understand] (2m)

- 7.** An aqueous solution of metal nitrate 'P' reacts with sodium bromide solution to form yellow precipitate 'Q' which is used in photography. 'Q' on exposure to sunlight undergoes decomposition reaction to form metal present in 'P' along with a reddish brown gas. Identify 'P' and 'Q'. Write the balanced chemical equation for the chemical reaction. List the two categories in which the reaction can be placed.

[Apply] (3m)

- 8.** Identify the type of each of the following reactions. Also, state reason for the type of reaction with a suitable justification.

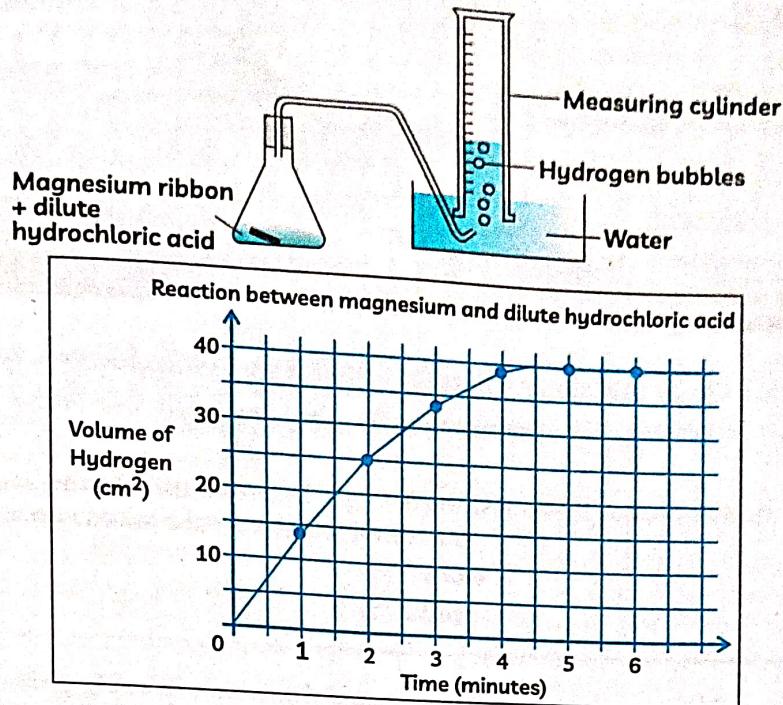


[Evaluate] (3m)

- 9.** What happens when food materials containing fats and oils are left for a long time? List two observable changes and suggest three ways by which this phenomenon can be prevented.

[Apply] (5m)

- 10.** Ayush added a piece of magnesium ribbon to a flask containing dilute hydrochloric acid. He observed that hydrogen gas is formed and collected it into the measuring cylinder. Ayush then plotted a graph between the amount of hydrogen formed and time, as shown. The line on the graph indicates the rate of chemical reaction occurring in the flask.



- (A) In the experiment performed by Ayush, at what time is the reaction rate fastest in the flask—at the start or at the end? [Understand]

OR

- (A) What would be the effect on rate of reaction if the temperature is lowered significantly for the above-mentioned experiment? [Apply] (2m)

- (B) Which of these could increase the rate of reaction in the flask?

P-Adding more acid to the flask

Q-Heating the acid in the flask

R-Using a higher concentration of acid

[Apply] (1m)

- (C) Ayush repeated the above reaction with magnesium powder in place of magnesium ribbon under the same conditions. Will the reaction rate increase or decrease?

Explain your answer with reference to the volume of hydrogen formed in the flask at 2 minutes.

[Analyse] (1m)



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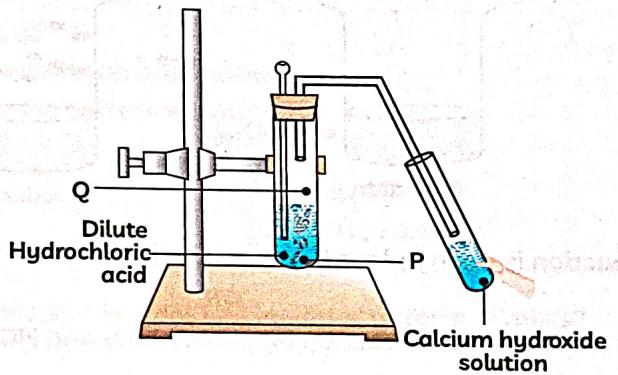




Note: (1) Topic names and solutions of each Question are available via QR code
(2) Mark ✓ or ✗ on the Question circle, after attempting.

2. Which of the following gives the correct increasing order of acid strength?
(a) Water < acetic acid < hydrochloric acid (b) Water < hydrochloric acid < acetic acid
(c) Acetic acid < water < hydrochloric acid (d) Hydrochloric acid < water < acetic acid

- 3.** Study the experimental set up shown in given figure and choose the correct option from the following:



| | P | Q | Change observed in Calcium hydroxide solution |
|-----|-----------|------------|---|
| (a) | K_2CO_3 | Cl_2 gas | No change |
| (b) | $KHCO_3$ | CO_2 gas | No change |
| (c) | $KHCO_3$ | H_2 gas | Turns milky |
| (d) | K_2CO_3 | CO_2 gas | Turns milky |

[Apply] (1m)

- 4.** The given question consist of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

Assertion (A): Zinc reacts with sodium hydroxide solution and hydrogen gas is evolved.

Reason (R): All metals react with bases to evolve hydrogen gas.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
(b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.

[Understand] (1m)

5. Why are metal oxides generally basic, while non-metal oxides tend to be acidic? [Understand] (2m)

6. On adding a few drops of universal indicator in three colourless solutions X, Y and Z taken separately in three test tubes, a student observed the changes in colour as green in X, red in Y and blue in Z.

(A) Arrange X, Y and Z in increasing order of their pH values.

(B) Which one of the three, X, Y and Z, will change the colour of phenolphthalein? Why? [Analyse] (2m)

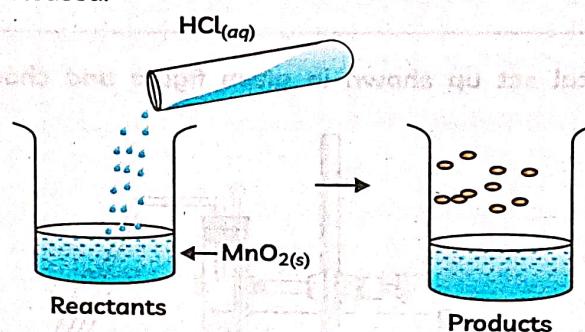
7. Do acidic solutions also have hydroxide ions (OH^-) ions? Explain with an example.

[Understand] (3m)

8. Identify the acid and the base from which sodium chloride is obtained. Which type of salt is it? When is it called rock salt? How is rock salt formed? [Understand] (3m)

9. The water of crystallisation refers to the water molecules that form the structure of a salt crystal, which is chemically linked. How does this water of crystallisation affects the state and colour of the compounds? [Understand] (5m)

10. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released.



(A) What type of reaction is taking place between MnO_2 and HCl?

[Understand]

OR

(A) Identify the gas released in the reaction between MnO_2 and HCl. What are its properties?

[Understand] (2m)

[Remember] (1m)

(B) How is bleaching powder produced from slaked lime?

(C) Sodium carbonate is a mixture of a strong base and a weak acid. Justify the statement with appropriate equation for the production of the same.

[Evaluate] (1m)

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4

UNIT TEST WORKSHEET

DIFFICULTY LEVEL
HARD



10Qs



50 min.

Educart

Acids, Bases and Salts

(Chapter 2)

Note: (1) Topic names and solutions of each Question are available via QR code
 (2) Mark ✓ or ✗ on the Question circle, after attempting.

- 1.** Match the chemical substances given in Column I with their appropriate application given in Column II:
 Choose the correct option:
 (a) (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)
 (b) (A)-(iii); (B)-(ii); (C)-(iv); (D)-(i)
 (c) (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)
 (d) (A)-(ii); (B)-(iv); (C)-(i); (D)-(iii)

| Column I | Column II |
|----------------------|-------------------------------------|
| (A) Bleaching Powder | (i) Preparation of glass |
| (B) Baking Soda | (ii) Production of H_2 and Cl_2 |
| (C) Washing Soda | (iii) Decolourisation |
| (D) Sodium Chloride | (iv) Antacid |

[Apply] (1m)

- 2.** Leena was advised by her teacher to wear gloves and use forceps while dipping the pH paper in the liquids.

What was the reason for this advice?

- (I) Gloves keep the hands warm.
- (II) Forceps provide better grip than bare hands.
- (III) Gloves protect hands from corrosive liquids.

Options:

- | | |
|----------------|-----------------------|
| (a) Only (I) | (b) Only (II) |
| (c) Only (III) | (d) Both (I) and (II) |

[Evaluate] (1m)

- 3.** Which of the following oxide(s) is/are soluble in water to form alkalies?

- | | |
|--------------|-------------|
| (I) Na_2O | (II) SO_2 |
| (III) K_2O | (IV) NO_2 |

Options:

- | | |
|-------------------|----------------|
| (a) (I) and (III) | (b) (I) only |
| (c) (II) and (IV) | (d) (III) only |

[Analyse] (1m)

- 4.** The given question consist of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

Assertion (A): While diluting an acid, water is slowly added to acid with constant stirring.

Reason (R): The process of dissolving an acid in water is a highly exothermic reaction.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

[Analyse] (1m)

- 5.** An acidic solution 'X' gives orange colour when a drop of it falls on pH paper, while a basic solution 'Y' gives bluish colour when a drop of it falls on pH paper. Write the reactions when both 'X' and 'Y' react with a metal.

[Apply] (2m)

6. Compare the use of sodium hydroxide and hydrochloric acid in the neutralisation process. Which one would work better in treating an acidic spill in a laboratory? Justify your answer. [Evaluate] (2m)

7. (A) Identify the gases evolved at the anode and cathode in the above experimental set up.

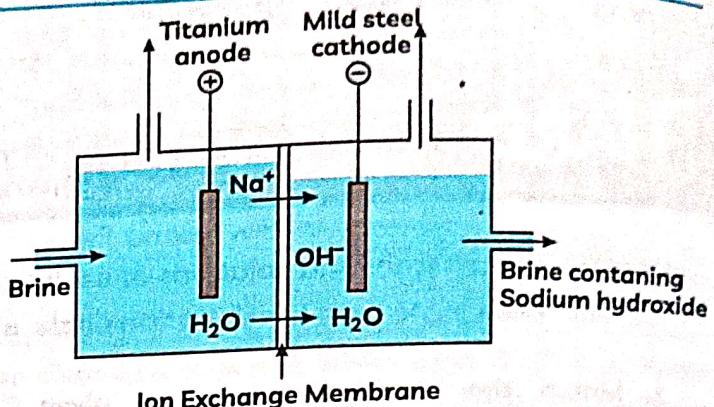
[Understand]

(B) Name the process that occurs. Why is it called so?

[Understand]

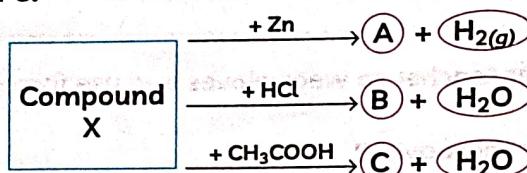
(C) Illustrate the reaction of the process with the help of a chemical equation.

[Understand] (3m)



8. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH_3COOH) is added to test tube B. In which test tube will the fizzing occur more vigorously and why? [Analyse] (3m)

9. Identify the compound X on the basis of the reactions given below. Also, write the name and chemical formulae of A, B and C.



[Apply] (5m)

10. The flow chart shows an important compound used in Chemistry.

(The letters do not represent chemical symbols of substances.)

(A) Identify 'X', 'Y' and 'Z'

[Analyse] (1m)

(B) Write chemical equations between:

- (i) 'X' and chlorine
- (ii) white powder 'Y' and H_2SO_4 [Apply] (1m)

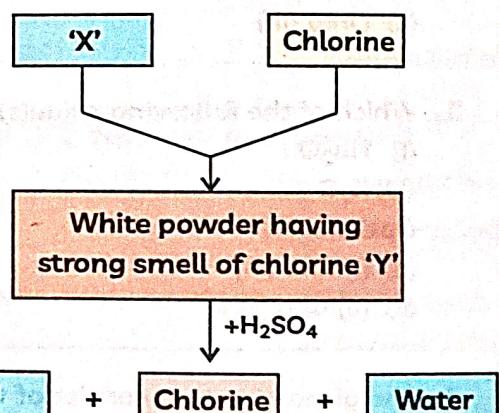
(C) What happens if 'Y' is exposed to air for a long time? List any two important uses of 'Y'.

[Apply]

OR

(C) What happens when 'X' reacts with CO_2 ? Also, state its significance in daily life.

[Understand] (2m)



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5

UNIT TEST WORKSHEET

DIFFICULTY LEVEL

MEDIUM



10Qs



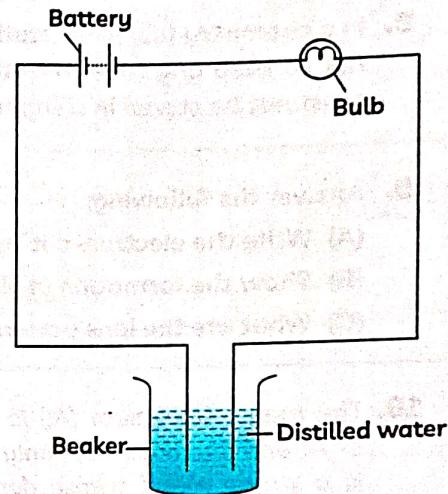
45 min.

Note: (1) Topic names and solutions of each Question are available via QR code
 (2) Mark ✓ or ✗ on the Question circle, after attempting.

- 1.** Raghav made an electric circuit using an LED, a battery, and connecting wires, as shown.

Raghav noticed that the LED does not glow. He replaced the distilled water with a salt solution of NaCl , MgCl_2 , and CCl_4 , one by one. He observed that the bulb glowed with salt solutions of NaCl and MgCl_2 , but the LED bulb did not glow when the CCl_4 solution was taken. Which of the solutions used by Raghav contains only a covalent bond?

- (a) NaCl
- (b) CCl_4
- (c) Distilled water
- (d) Both (b) and (c)



[Analyse] (1m)

- 2.** An element 'M' has 50% of the electrons filled in the 3rd shell as in the 2nd shell. The atomic number of 'M' is:

- (a) 10
- (b) 12
- (c) 14
- (d) 18

[Apply] (1m)

- 3.** The metal X does not react with cold water but floats on hot water with formation of colourless bubbles. Which of the following represents metal X.

- (a) Aluminium
- (b) Copper
- (c) Magnesium
- (d) Lead

[Analyse] (1m)

- 4.** The given question consist of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

Assertion (A): Hydrogen gas is evolved when a metal reacts with nitric acid.

Reason (R): Nitric acid is a strong oxidising agent.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

[Understand] (1m)

- 5.** Give reason for the following:

- (A) Titanium is a strategic metal.
- (B) Non-metals do not form positively charged ions.

[Understand] (2m)

6. How do properties of iron change when:

- (A) a small quantity of carbon is mixed in it?
- (B) nickel and chromium are mixed in it?

[Analyse] (2m)

7. Alisha performed an experiment in her science lab. After performing, she explained the whole class that a shining metal 'M', on burning gives a dazzling white flame and changes to a white powder 'N'.

- (A) Identify 'M' and 'N'. [Analyse]
- (B) Represent the above reaction in the form of a balanced chemical equation. [Apply]
- (C) Alisha stated that 'M' metal will undergo oxidation reaction when oxygen is added to it? Justify and support her statement. [Apply] (3m)

8. In a chemistry lab, while students were working with different chemicals, the teacher asked students not to keep any silver nitrate compound in utensils made up of copper. Explain why silver nitrate must not be stored in a copper vessel. [Understand] (3m)

9. Answer the following:

- (A) Write the electron-dot structures for sodium, oxygen and magnesium. [Remember]
- (B) Show the formation of Na_2O and MgO by the transfer of electrons. [Apply]
- (C) What are the ions present in these compounds? [Understand] (5m)

10. The metal Aluminium (Al) is widely used in industry. The usage of Al and its alloys rank only second to ferrous (or iron) alloys. It is a strong metal whose density is one third of steel. It is also an excellent conductor of heat and electricity and resistive to corrosion. Pure aluminium exhibits good corrosion resistance due to the formation of a barrier oxide film that is bounded strongly to its surface. Hence, Al is known as self-protective metal.

Although, Aluminium is the most abundant metal on the Earth, its extraction requires huge amount of electricity.



(A) Aluminium is highly reactive metal, still it is used to make cooking utensils. Give reason. [Apply] (1m)

(B) Why does reactivity of aluminium metal decreases if it is dipped in nitric acid? [Understand] (1m)

(C) Aluminium metal and compound iron (III) oxide are used to join railway tracks.

(i) Identify the reaction.

(ii) Write down the reaction.

[Understand]

OR

(C) How are the topmost metals of the reactivity series extracted? Name at least two such metals. [Understand] (2m)

ANSWER

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DIFFICULTY LEVEL

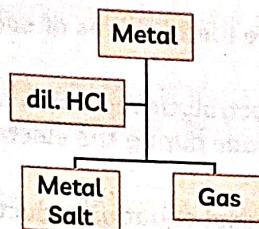
HARD

10Qs



Note: (1) Topic names and solutions of each Question are available via QR code
 (2) Mark ✓ or ✗ on the Question circle, after attempting.

1.



Which of the following two combinations are correct?

| | Metal | Gas Evolved |
|-------|-----------|-------------|
| (I) | Copper | Yes |
| (II) | Iron | Yes |
| (III) | Magnesium | No |
| (IV) | Zinc | Yes |

Options:

- (a) (I) and (III)
 (b) (I) and (IV)
 (c) (II) and (III)
 (d) (II) and (IV)

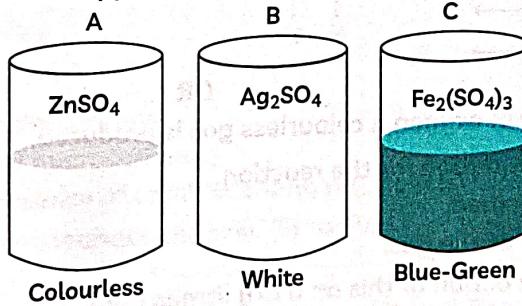
[Analyse] (1m)

2. The electronic configurations of three elements X, Y and Z are X : 2, 8; Y : 2, 8, 7 and Z : 2, 8, 2. Which of the following is correct?

- (a) X is a metal
 (b) Y is a metal
 (c) Z is a non-metal

- (d) Y is a non-metal and Z is a metal [Analyse] (1m)

3. Sandhya took three beakers A, B and C containing zinc sulphate, silver sulphate and iron(II) sulphate solutions respectively. She added copper pieces to each beaker.



The solution will appear blue in the case of:

- (a) Beaker A
 (b) Beaker B
 (c) Beaker C
 (d) Beakers B and C

[Analyse] (1m)

4. The given question consist of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

Assertion (A): Metals react with water to form a metal hydroxide or metal oxide and hydrogen gas.

Reason (R): Sodium metal reacts with cold water and form sodium hydroxide and hydrogen gas.

Iron reacts with steam to form iron oxide and hydrogen.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
 (b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
 (c) (A) is true but (R) is false.
 (d) (A) is false but (R) is true.

[Analyse] (1m)

5. An alkali metal A gives a compound B (molecular mass = 40) on reacting with water. The compound B gives a soluble compound C on treatment with aluminium oxide. Identify A, B and C and give the reactions involved. [Analyse] (2m)

6. An element E combines with O₂ to form an oxide E₂O, which is a good conductor of electricity. Write the formula of the compound formed when it combines with chlorine. [Apply] (2m)

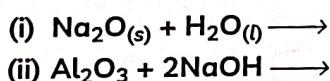
7. (A) "Carbon cannot be used to reduce metal oxides of sodium, magnesium, calcium, and aluminium to respective metals". Comment. [Evaluate]
 (B) These metals are obtained by electrolytic reduction of their molten chloride. Write the reactions that occur at the anode and cathode during the electrolytic reduction of molten sodium chloride. [Apply]
 (C) Illustrate with the help of a chemical equation reduction of manganese dioxide with Aluminium powder. [Apply] (3m)

8. An element 'M' with electronic configuration 2, 8, 3 combines separately with Cl⁻, SO₄²⁻ anions. Write the chemical formulae of the compounds formed. Predict with the suitable reason the nature of the bond formed by element 'M' in general. How will the electrical conductivity of the compounds formed vary with respect to 'M'? [Evaluate] (3m)

9. Two ores A and B were taken. On heating, ore A gives CO₂, whereas, ore B gives SO₂. What steps will you take to convert them into metals? [Apply] (5m)

10. Almost all metals combine with oxygen to form metal oxides. Metal oxides are generally basic in nature. But some metal oxides show both basic as well as acidic behaviour. Different metals show different reactivities towards oxygen. Some react vigorously while some do not react at all.

- (A) What happens when copper is heated in air? (Give the equation of the reaction involved). [Understand] (1m)
 (B) Why are some metal oxides categorised as amphoteric? Give one example. [Understand] (1m)
 (C) Complete the following equations:



[Apply]

OR

- (C) On burning Sulphur in oxygen a colourless gas is produced.
 (i) Write chemical equation for the reaction.
 (ii) Name the gas formed.
 (iii) State the nature of the gas.
 (iv) What will be the action of this on a dry litmus paper? [Apply] (2m)

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7

UNIT TEST WORKSHEET

DIFFICULTY LEVEL
MEDIUM



10Qs

45 min.

EduCart Carbon and its Compounds (Chapter 4)

Note: (1) Topic names and solutions of each Question are available via QR code
 (2) Mark ✓ or ✗ on the Question circle, after attempting.

- 1.** Anshuman conducts the following activity, where he took a naphthalene ball and burnt it.

He observed that it gives a yellow flame with lots of black smoke and sooty deposits around it. What type of hydrocarbon does naphthalene contain?

- (a) Unsaturated, as black smoke represents complete combustion.
- (b) Unsaturated, as sooty deposit represents unburnt hydrocarbons.
- (c) Saturated, as it gives a yellow flame which represents complete combustion.
- (d) Saturated, as the burning of any substance represents a complete combustion.



[Apply] (1m)

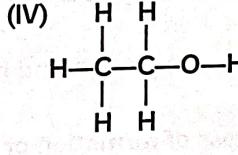
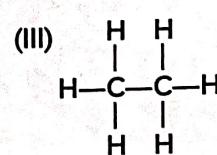
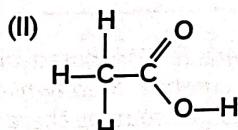
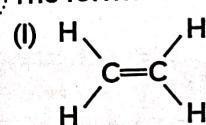
- 2.** In the given reaction, alkaline KMnO_4 acts as:



- (a) reducing agent
- (b) oxidising agent
- (c) catalyst
- (d) dehydrating agent

[Understand] (1m)

- 3.** The formulae of four organic compounds are shown below. Choose the correct option.



Options:

- (a) (I) and (II) are saturated hydrocarbons
- (b) (III) and (IV) are unsaturated hydrocarbons
- (c) Addition of hydrogen in presence of catalyst changes (I) to (III)
- (d) Addition of potassium permanganate changes (II) to (IV)

[Understand] (1m)

- 4.** The given question consist of two statements – Assertion (A) and Reason (R). Answer this question by selecting the appropriate option.

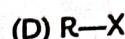
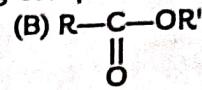
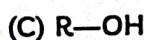
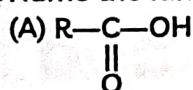
Assertion (A): Covalent compounds have low melting and boiling points.

Reason (R): Covalently bonded molecules have weak intermolecular forces.

- (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

[Understand] (1m)

5. Name the functional groups of the following compounds:



[Understand] (2m)

6. The table shows the electronic structures of four elements.

| Element | Electronic Structure |
|---------|----------------------|
| P | 2, 6 |
| Q | 2, 8, 1 |
| R | 2, 8, 7 |
| S | 2, 8, 8 |

(A) Identify which element(s) will form covalent bonds with carbon. [Understand]

(B) "Carbon reacts with an element in the above table to form several compounds." Give suitable reason. [Apply] (2m)

7. (A) Draw the electron dot structure for ethyne. [Apply]

(B) List two differences between the properties exhibited by covalent compounds and ionic compounds. [Understand] (3m)

8. How would you bring about the following conversions? Name the process and write the reaction involved.

(A) Ethanol to ethene

(B) Propanol to propanoic acid

[Apply] (3m)

9. A compound C (molecular formula, $\text{C}_2\text{H}_4\text{O}_2$) reacts with Na metal to form a compound R and evolves a gas which burns with a pop sound. Compound C, on treatment with an alcohol A in the presence of an acid, forms a sweet smelling compound S (molecular formula, $\text{C}_3\text{H}_6\text{O}_2$). On addition of NaOH to C, it also gives R and water. S, on treatment with NaOH solution, gives back R and A. Identify C, R, A, S and write down the reactions involved. [Analyse] (5m)

10. Ankit and his friend Sanjay were feeling bored one day. So, they thought of making something creative. Meanwhile, Ankit's mother asked him to go to the market to get soap as there was no soap left in the house. So, they thought of making soap with the ingredients available at home!



(A) What are the ingredients used by Ankit and his friend Sanjay to make soap at home? (1m)

(B) Write the steps in the process of formation of soap. (1m)

(C) Name the ingredient added to the aqueous mixture to make the soap come out of solution and why is this ingredient added?

OR

(C) If Ankit and Sanjay added some essential oils or natural colours to their soap, what would be the impact on the soap's properties? What precautions should they take while adding these substances? [Understand] (2m)

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