Worksheet 3.4

Marks - 25

Case study based questions

10th Science

Metals and Non- Metals

Passage - 1 **5 Marks**

Reactive metals can displace less reactive metals from their compounds in solution or molten form. All metals are not equally reactive. The reactivity of various metals with oxygen, water and acids. But all metals do not react with these reagents. So we were not able to put all the metal samples we had collected in decreasing order of their reactivity. Displacement reaction give better evidence about the reactivity of metals.

Q 1. State True or False. Metals are reactive.

(1) TRUE
(2) FALSE

Q 2. Reactivity of metals are evidenced by _____.

(1) Displacement
(2) Replacement

Q 3. Do All metals reacts with reagent.

(1) YES
(2) NO

Q 4. Why can all metals not be put in increasing order?

(1) All Metals do react with reagents
(2) All Metals do not react with reagents

Worksheet 3.4

Marks - 25

Q 5. Metals react with _____.

(1) Oxygen
(2) Water
(3) Acid
(4) All of the above

Passage - 2

5 Marks

Ores mined from the earth are usually contaminated with large amounts of impurities such as soil, sand, etc., called gangue. The impurities must be removed from the ore prior to the extraction of the metal. The processes Several steps are involved in the extraction of pure metal from ores. Metals and Non-metals are used for removing the gangue from the ore are based on the differences between the physical or chemical properties of the gangue and the ore. Different separation techniques are accordingly employed.

Q 1. What are the impurities in ores?

(1) Soil
(2) sand
(3) Metals
(4) Both A and B

Worksheet 3.4

Marks - 25

Q 2. Why is ores mined from earth is contaminated?

(1) Many materials are togetherly found
(2) Only one form of material found

Q 3. Gangue is removed by-

(1) Metals
(2) Non metals
(3) Both A and B

Q 4. Ores are mined from _____.

(1) Earth
(2) Mercury

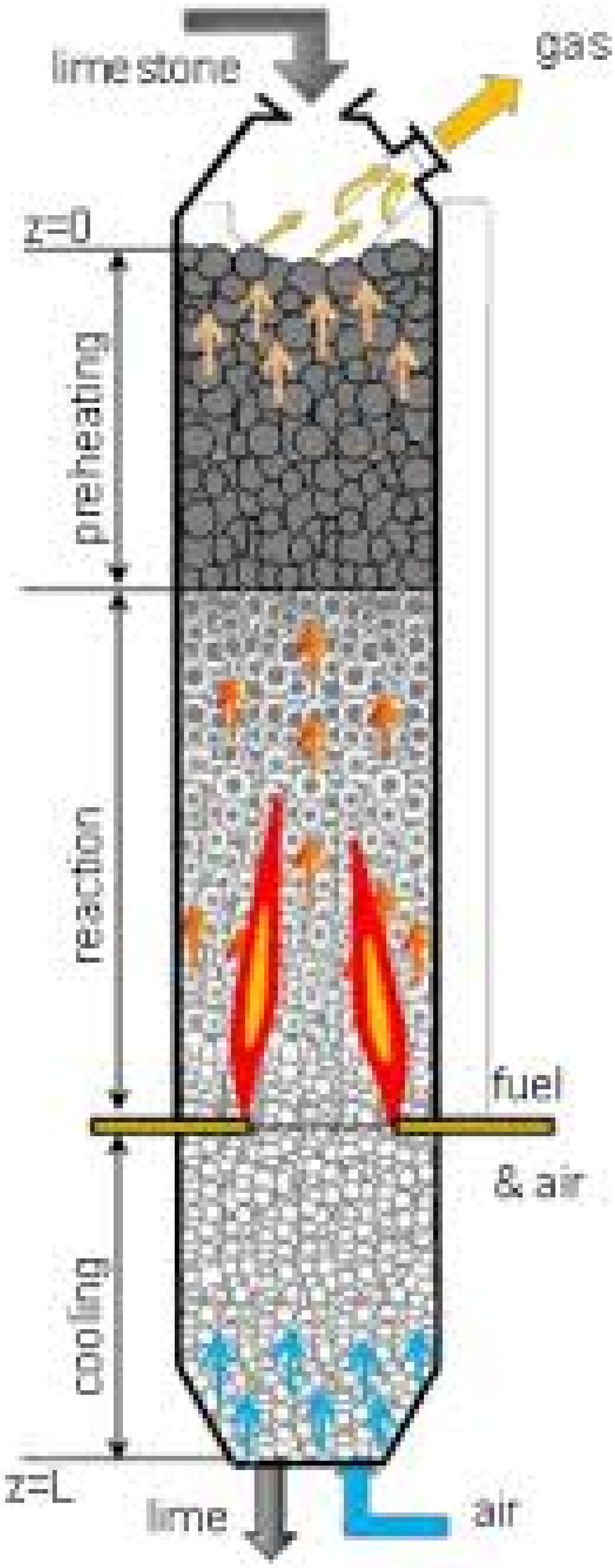
Q 5. Which of the following metal is extracted from cinnabar ore?

(1) Sodium
(2) Zinc
(3) Copper
(4) Mercury

Passage - 3 **5 Marks**

Worksheet 3.4

Marks - 25



The metals in the middle of the activity series such as iron, zinc, lead, copper, are moderately reactive. These are usually present as sulphides or carbonates in nature. It is easier to obtain a metal from its oxide, as compared to its sulphides and carbonates. Therefore, prior to reduction, the metal sulphides

and carbonates must be converted into metal oxides. The sulphide ores are converted into oxides by heating strongly in the presence of excess air. This process is known as roasting. The carbonate ores are changed into oxides by heating strongly in limited air. This process is known as calcination.

Q 1. Metals are easily obtained from _____.

(1) Oxide
(2) Non metal

Q 2. Whic of the following are present as sulphides or carbonates in nature?

(1) Zinc
(2) Lead
(3) Copper
(4) All of the above

Q 3. Carbonates ore when heated stongly in the presence of air leads to a process called as_____.

(1) Calcination
(2) Bromination

Q 4. Sulphides and carbonates must be converted in to metal oxide before _____ process.

(1) Oxidation
(2) Reduction

Q 5. Is Copper is reactive metal?

(1) YES
(2) NO

Passage - 4 **5 Marks**

The metals high up in the reactivity series are very reactive. They cannotbe obtained from their compounds by heating with carbon. For example, carbon cannot reduce the oxides of sodium, magnesium, calcium, aluminium, etc., to the respective metals. This is because these metals have more affinity for oxygen than carbon. These metals are obtained by electrolytic reduction. For example, sodium, magnesium and calcium are obtained by the electrolysis of their molten chlorides. The metals are deposited at the cathode (the negatively charged electrode), whereas, chlorine is liberated at the anode (the positively charged electrode).

Q 1. Cathode electrodes are _____ charged.

(1) Positively
(2) Negatively

Q 2. Can Calcium oxides be reduced by carbon?

(1) YES
(2) NO

Q 3. Anode electrodes are _____ charged.

(1) Positively
(2) Negatively

Q 4. Metals which have more affinity for oxygen than carbon.

(1) Magnesium
(2) Sodium
(3) Calcium
(4) All of the above

Q 5. _____ are obtained by molten chlorides.

(1) Magnesium
(2) Sodium
(3) Calcium
(4) All of the above

Passage - 5 **5 Marks**

Alloying is a very good method of improving the properties of a metal. iron is the most widely used metal. But it is never used in its pure state. This is because pure iron is very soft and stretches easily when hot. But, if it is mixed with a small amount of carbon (about 0.05 %), it becomes hard and strong. When iron is mixed with nickel and chromium, we get stainless steel, which is hard and

does not rust. Thus, if iron is mixed with some other substance, its properties change.

Q 1. Iron if mixed with other metals can change its properties?

(1) YES
(2) NO

Q 2. What happens to iron when mixed with carbon?

(1) It becomes Soft and weak
(2) It becomes Hard and strong

Q 3. Which of the following is an alloy?

(1) Mixture of nickel and chromium with iron
(2) Mixture of sodium and carbon with steel

Q 4. Which metal is never used in pure state?

(1) Iron
(2) Alloy

Q 5. State True or False. Iron can rust.

(1) TRUE
(2) FALSE

Worksheet 3.5

Marks - 25

Case study based questions

10th Science

Metals and Non- Metals

Passage - 1 **5 Marks**

If one of the metals is mercury, then the alloy is known as an amalgam. The electrical conductivity and melting point of an alloy is less than that of pure metals. For example, brass, an alloy of copper and zinc (Cu and Zn), and bronze, an alloy of copper and tin (Cu and Sn), are not good conductors of electricity whereas copper is used for making electrical circuits. Solder, an alloy of lead and tin (Pb and Sn), has a low melting point and is used for welding electrical wires together

Q 1. Copper and tin are -

(1) Bad conductors
(2) Good conductors

Q 2. Electrical circuits can be made from_____.

(1) Alloy
(2) Copper

Q 3. What is an amalgam?

(1) Mercury
(2) Alloy

Q 4. Sate True or False: Brass is an alloy of Pb and Sn.

(1) TRUE

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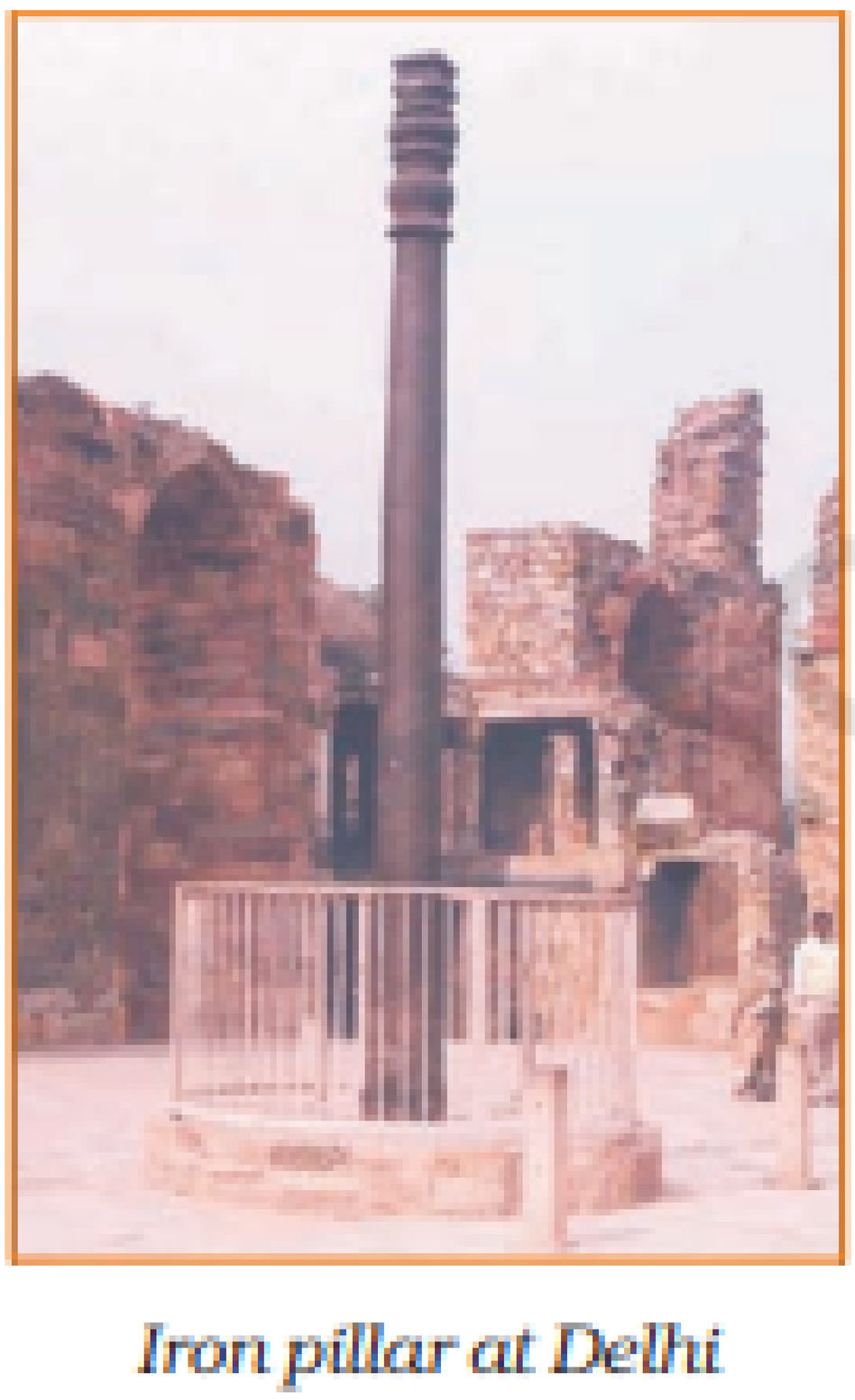
(2) FALSE

Q 5. Which of following is an alloy of copper?

(1) Brass
(2) Bronze
(3) Solder
(4) Tin

Passage - 2

5 Marks



Iron pillar at Delhi

The iron pillar near the Qutub Minar in Delhi was built more than 1600 years ago by the iron workers of India. They had developed a process which prevented

iron from rusting. For its quality of rust resistance it has been examined by scientists from all parts of the world. The iron pillar is 8 m high and weighs 6 tonnes (6000 kg).

Q 1. Where is the iron pillar located ?

(1) Delhi
(2) Mumbai

Q 2. Is the iron pillar rusted?

(1) YES
(2) NO

Q 3. The height of the Iron pillar is ____m

(1) 5m
(2) 6m
(3) 8m
(4) 7m

Q 4. Which of the following process is used presently to prevent rusting?

(1) Painting
(2) Galvanization

Q 5. What is the chemical formula of Rust?

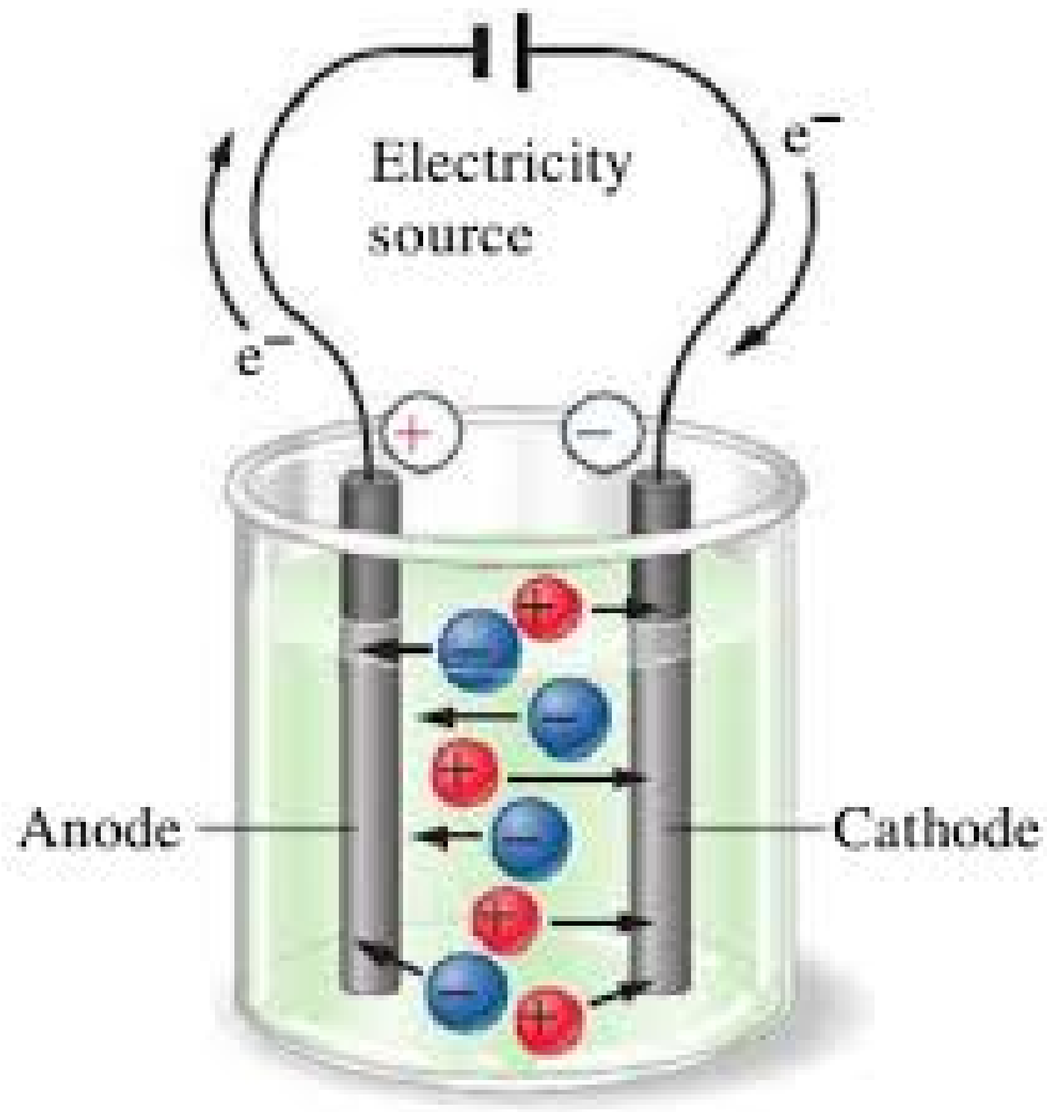
(1) $Fe_3O_3 \cdot n2H_2O$
(2) $Fe_2O_3 \cdot n2H_2O$

Worksheet 3.5

Marks - 25

Passage - 3

5 Marks



The conduction of electricity through a solution involves the movement of charged particles. A solution of an ionic compound in water contains ions, which move to the opposite electrodes when electricity is passed through the solution. Ionic compounds in the solid state do not conduct electricity because movement of ions in the solid is not possible due to their rigid structure. But ionic compounds conduct electricity in the molten state. This is possible in the molten state since the elecrostatic forces of attraction between the oppositely charged ions are overcome due to the heat. Thus, the ions move freely and conduct electricity

Q 1. State TRUE or FALSE: Ionic Compounds do not conducts electricity in molten state.

(1) TRUE
(2) FALSE

Q 2. Ions move _____.

(1) Freely
(2) Readily

Q 3. There is _____ attraction between oppositely charged ions.

(1) Kinetic
(2) Electrostatic

Q 4. State TRUE or FALSE: Forces of attraction between the oppositely charged ions are overcome due to the heat.

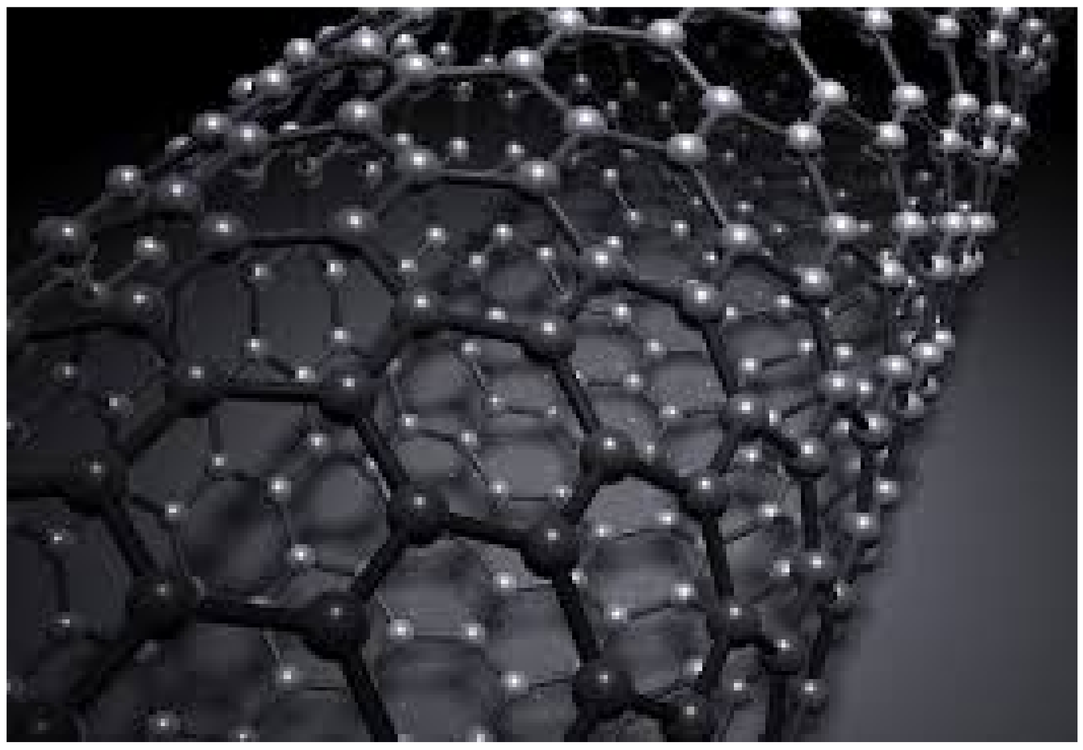
(1) TRUE
(2) FALSE

Q 5. Movements of ions are not possible in solid state because of _____.

(1) Free state
(2) Rigid state

Passage - 4

5 Marks



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cannot reduce the oxides of sodium, magnesium, calcium, aluminium, etc., to the respective metals. This is because these metals have more affinity for oxygen than carbon. These metals are obtained by electrolytic reduction. For example, sodium, magnesium and calcium are obtained by the electrolysis of their molten chlorides. The metals are deposited at the cathode (the negatively charged electrode), whereas, chlorine is liberated at the anode (the positively charged electrode). The reactions are At cathode $Na^+ + e^- \rightarrow Na$ At anode $2Cl^- \rightarrow Cl_2 + 2e^-$

Q 1. Reactivity series cannot be obtained from _____.

(1) Sodium
(2) Carbon

Q 2. Cl has what type of charge_____.

(1) Positive
(2) Negative

Q 3. Metals Obtained by electrolysis are-

(1) Sodium
(2) Magnesium
(3) Calcium
(4) All of the above

Q 4. Chlorine gas is released at _____.

(1) Cathode
(2) Anode

Worksheet 3.5

Marks - 25

Q 5. Magnesium has more affinity towards oxygen.

(1) YES
(2) NO

Passage - 5 **5 Marks**

Different metals show different reactivities towards oxygen. Metals such as potassium and sodium react so vigorously that they catch fire if kept in the open. Hence, to protect them and to prevent accidental fires, they are kept immersed in kerosene oil. At ordinary temperature, the surfaces of metals such as magnesium, aluminium, zinc, lead, etc., are covered with a thin layer of oxide. The protective oxide layer prevents the metal from further oxidation. Iron does not burn on heating but iron filings burn vigorously when sprinkled in the flame of the burner. Copper does not burn, but the hot metal is coated with a black coloured layer of copper(II) oxide. Silver and gold do not react with oxygen even at high temperatures

Q 1. Which of the following form a thin layer or oxide during normal temperature_____.

(1) Sodium
(2) Zinc

Q 2. At high temeperature _____ do not react.

(1) Gold
(2) Silver
(3) Zinc
(4) Both A and B

Q 3. Oxide layer prevents metal from _____.

(1) Reduction

(2) Oxidation

Q 4. If kept open which of the following catches fire?

(1) Gold
(2) Potassium

Q 5. Iron burns vigorously when burned on flame.

(1) YES
(2) NO