

Chapter 3 Metals & Non Metals

MULTIPLE CHOICE QUESTIONS

Q.1. The most abundant metal in the earth's crust is

- (a) Iron
- (b) Aluminium
- (c) Calcium
- (d) Sodium

Q.2. The electronic configuration of three elements X, Y and Z are as follows: X = 2, 4 Y = 2, 7 Z = 2, 1 Which two elements will combine to form an ionic compound and write the correct formula,

- (a) X_2Y
- (b) ZY
- (c) XZ_3
- (d) Y_2Z

Q.3. Which of the following property is generally not shown by metals?

- a) Electrical conduction
- b) Sonorous
- c) Dullness
- d) Ductility

Q.4. Which one of the following metals do not react with cold as well as hot water?

- a) Na
- b) Ca
- c) Mg
- d) Fe

Q.5. Which of the following pair of metals exist in their native state in nature?

- (a) Ag and Au
- (b) Ag and Zn
- (c) Au and Hg
- (d) Au and Fe

Q.6. Which property of metals is used for making bells and strings of musical instruments like Sitar and Violin?

- (a) Sonorousness
- (b) Malleability
- (c) Ductility
- (d) Conductivity

Q.7. The atomic number of an element 'X' is 12. Which inert gas is nearest to X?

- (a) He
- (b) Ar
- (c) Ne
- (d) Kr

Q.8. The process in which a carbonate ore is heated strongly in the absence of air to convert it into metal oxide is called_____

- (a) Roasting
- (b) Reduction
- (c) Calcination
- (d) Smelting

Q.9. Which of the following metals exist in their native state in nature?

(i) Cu (ii) Au (iii) Zn (iv) Ag

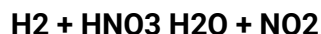
- (a) (i) and (ii)

(b) (ii) and (iii)

(c) (ii) and (iv)

(d) (iii) and (iv)

10. The chemical reaction between a piece of copper and nitric acid is given by the chemical equations,



What can be inferred from the chemical equation?

(a) Copper causes the oxidation of HNO_3 to form NO_2 .

(b) Hydrogen gas gets oxidized by HNO_3 to form water.

(c) gas reacts with oxygen in the air to form water.

(d) Nitrate reacts with hydrogen to form NO_2 and H_2O .

11. Which of the following is the correct arrangement of the given metals in ascending order of their reactivity?

Zinc, Iron, Magnesium, Sodium

(a) Zinc > Iron > Magnesium > Sodium

(b) Sodium > Magnesium > Iron > Zinc

(c) Sodium > Zinc > Magnesium > Iron

(d) Sodium > Magnesium > Zinc > Iron

Q.12. Which one among the following is an acidic oxide?

(a) Na_2O (b) CO (c) CO_2 (d) Al_2O_3

Q.13. Which of the given non-metal is a liquid?

1. a) Hydrogen
2. b) Bromine
3. c) Chlorine
4. d) Mercury

Q.14. Metallic oxide are generally _____ in nature.

1. a) Acidic

2. b) Basic
3. c) Neutral
4. d) Amphoteric

15. Galvanisation is a method of protecting iron from rusting by coating with a thin layer of

- (a) Gallium
- (b) Aluminium
- (c) Zinc
- (d) Silver

Q.16. Non-metals form covalent chlorides because

- (a) they can give electrons to chlorine
- (b) they can share electrons with chlorine
- (c) they can give electrons to chlorine atoms to form chloride ions
- (d) they cannot share electrons with chlorine atoms

17. An element X is soft and can be cut with a knife. This is very reactive to air and cannot be kept open in air. It reacts vigorously with water. Identify the element from the following

- (a) Mg
- (b) Na
- (c) P
- (d) Ca

18. Sodium chloride is a _____ compound

18. a) Covalent
19. b) Ionic
20. c) Non-ionic
21. d) None of these

Q.19. A student adds some metallic ash in water taken in a test tube. The ash gets completely dissolved in water and the solution changes its colour. What should the student do next to test the chemical properties of the product formed?

- (a) Evaporate the solution to get crystals.

(b) Measure the temperature change using a thermometer.

(c) Test the acidity using a blue litmus paper.

(d) Test the basicity using a red litmus paper.

Q.20. Which of the following is the correct arrangement of the given metals in ascending order of their reactivity?

Zinc, Iron, Magnesium, Sodium

(a) Zinc > Iron > Magnesium > Sodium

(b) Sodium > Magnesium > Iron > Zinc

(c) Sodium > Zinc > Magnesium > Iron

(d) Sodium > Magnesium > Zinc > Iron

Q.21. Which of the following are not ionic compounds?

(i) KCl (ii) HCl (iii) CCl₄ (iv) NaCl

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (iii) and (iv)

(d) (i) and (iii)

Q.22. Reaction between X and Y forms compound Z. X loses electron and Y gains electron. Which of the following properties is not shown by Z?

(a) Has high melting point

(b) Has low melting point

(c) Conducts electricity in molten state

(d) Occurs as solid

23. The ability of metals to be drawn into thin wire is known as

a) ductility

b) malleability

- c) sonorosity
- d) conductivity

24. Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same?

- (i) Good thermal conductivity**
 - (ii) Good electrical conductivity**
 - (iii) Ductility**
 - (iv) High melting point**
- (a) (i) and (ii)
 - (b) (i) and (iii)
 - (c) (ii) and (iii)
 - (d) (i) and (iv)

25. A student makes an electric circuit using an LED, a battery and connecting wires to test the conductivity of distilled water. The student notices that the LED does not glow. He replaces the distilled water with a salt solution and observes that the LED glows. How does the salt solution help the LED to glow?

- (a) Salt solution is covalent in nature and conducts electricity.
- (b) Salt solution has a low melting point which allows the current to flow through it.
- (c) Salt solution has a high boiling point which allows the flow of current in the circuit without getting hot.
- (d) Salt solution contains ions which makes it conductive and allows the electricity to flow through it.

ASSERTION AND REASON QUESTIONS

DIRECTION: Each of these questions contains an Assertion followed by Reason. Read them carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements.

- (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.*
- (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.*

(c) Assertion is true but the Reason is false.

(d) The statement of the Assertion is false but the Reason is true.

Q.1. Assertion: iron is found in the free state in nature.

Reason: iron a highly reactive element.

Q.2. Assertion (A): Ionic compounds have high melting and boiling points.

Reason (R): A large amount of energy is required to break the strong inter-ionic attraction in ionic compounds.

Q.3. Assertion: Silver becomes black in colour when exposed to atmosphere.

Reason: Silver reacts with H_2S gas to form Ag_2S which is black in colour.

Q.4. Assertion (A): Ionic compounds and solids are somewhat hard.

Reason (R): They are electrovalent compounds and have strong force of attraction between oppositely charged ions.

Q.5. Assertion: Copper does not reacts with the H_2SO_4 .

Reason: Copper is more reactive than hydrogen.

Q.6. Assertion (A): Rusting of iron is a slow combustion

Reason (R): Iron slowly reacts with oxygen and form iron oxide.

Q.7. Assertion: Nitrogen is a non-metal.

Reason: Nitrogen has 5 valence electrons.

Q.8. Assertion: Al_2O_3 , is an amphoteric oxide.

Reason: Al_2O_3 reacts with acid as well as base to form salt and water.

Q.9. Assertion (A): Iron is the most widely used metal. But it is never used in its pure state.

Reason (R): Pure iron is very soft and stretches easily when hot.

Q.10. Assertion (A): All non metals are insulators.

Reason (R): Graphite is a good conductor of electricity.

CASE STUDY QUESTIONS

Q.1. Read the following and answer the questions :

On the basis of reactivity of different metals with oxygen, water and acids as well as displacement reactions, the metals have been arranged in the decreasing order of their reactivities. This arrangement is known as activity series or reactivity series of metals.

The basis of reactivity is the tendency of metals to lose electrons. If a metal can lose electrons easily to form positive ions, it will react readily with other substances. Therefore, it will be a reactive metal. On the other hand, if a metal loses electrons less rapidly to form a positive ion, it will react slowly with other substances. Therefore, such a metal will be less reactive.

I) Which of the following metals is less reactive than hydrogen?

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

ii) Which of the following elements is not present in stainless steel?

- (a) Iron
- (b) Chromium
- (c) Tungsten
- (d) Nickel

iii) Which of the following metals reacts vigorously with oxygen?

- (a) Zinc
- (b) Magnesium
- (c) Sodium
- (d) Copper

iv) Which of the following represents the correct order of reactivity for the given metals?

- (a) $\text{Na} > \text{Mg} > \text{Al} > \text{Cu}$
- (b) $\text{Mg} > \text{Na} > \text{Al} > \text{Cu}$
- (c) $\text{Na} > \text{Mg} > \text{Cu} > \text{Al}$
- (d) $\text{Mg} > \text{Al} > \text{Na} > \text{Cu}$

V) Hydrogen gas is not evolved when a metal reacts with nitric acid. It is because

HNO₃, is a strong oxidising agent. It oxidises the H, produced to water and itself gets reduced to any of the nitrogen oxides (N₂O, NO, NO₂). But _____ and _____ react with very dilute HNO₃ to evolve H₂ gas.

- (a) Pb, Cu
- (b) Na, K
- (C) Mg, Mn
- (d) Al, Zn

Q.2. Alloying is a very good method of improving the properties of a metal. This gives the desired properties of the metal. For example, 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. In fact, the properties of any metal can be changed, if it is mixed with some other substance. The substance added may be a metal or a non-metal.

i) Which among the following alloys contain non-metal as one of its constituents?

- (a) Brass
- (b) Bronze
- (c) Amalgam
- (d) Steel

ii) An alloy can be one of the following types:

- (a) Homogenous
- (b) Heterogeneous
- (c) Intermetallic
- (d) All of the above

iii) By adding silicon to stainless steel which of the following property is enhanced?

- (a) Resistance to corrosion
- (b) Electrical characteristics

(c) Ductility

(d) Magnetic property

iv) Which of the following alloy(s) contain mercury as one of its constituents?

(a) Zinc amalgam

(b) Alnico

(c) Solder

(d) Bronze

Q.3. When a silvery grey powder of a solid (A) is mixed with a powder solid (B) no reaction occurs. But if the mixture is ignited and lighted using magnesium ribbon a reaction occurs with evolution of large amount of heat forming product (C) which settles down as liquid metal and the solid product(D) formed floats on the liquid (C). (C) in solid form reacts with moisture to form rust. The amount of heat generated during the reaction is so high that the reaction is used in welding of electric conductors, joints in railway tracks.

Based on this information, answer the following questions.

i. Identify A and C?

- A. A- Al and C- Fe
- B. A-Fe and C—Al
- C. A-Mg and C -Al
- D. A-Al and C -Cu

ii Identify B and D which are oxides of

- A. B- Fe , D- Al
- B. B- Mg, D-Al
- C. B- Al , D- Cu
- D. D. B-Al , D –Fe

iii . Amphoteric oxides are

- A. metal oxides which do not react with acids but react with bases
- B. metal oxides which reacts with both acids as well as bases
- C. metal oxides which reacts with acids but do not react with bases
- D. metal oxides which shows no reaction with either acids or bases

iv. Which of the following is amphoteric in nature?

- A. both aluminium oxide and zinc oxide
- B. Only Zinc oxide
- C. Only Aluminium oxide
- D. Neither of them

Q.4. Metals as we know, are very useful in all fields, industries in particular. Non-metals are no less in any way. Oxygen present in air is essential for breathing as well

as for combustion. Non-metals form a large number of compounds which are extremely useful, e.g., ammonia, nitric acid, sulphuric acid, etc. Non-metals are found to exist in three states of matter. Only solid non-metals are expected to be hard however, they have low density and are brittle. They usually have low melting and boiling points and are poor conductors of electricity.

i) _____ is a non-metal but is lustrous

- (a) Phosphorus
- (b) Sulphur
- (c) Bromine
- (d) Iodine

ii) Which of the following is known as 'King of chemicals'?

- (a) Urea
- (b) Ammonia
- (c) Sulphuric acid
- (d) Nitric acid

iii) Which of the following non-metals is a liquid?

- (a) Carbon
- (b) Bromine
- (c) Iodine
- (d) Sulphur

iv) Hydrogen is used

- (a) for the synthesis of ammonia
- (b) for the synthesis of methyl alcohol
- (c) in welding torches
- (d) all of these

v) Generally, non-metals are bad conductors of electricity but 'X' which is a form of carbon is a good conductor of electricity and is an exceptional non-metal. 'X' is

- (a) diamond
- (b) graphite
- (c) coal
- (d) coke

Q.5. On the basis of reactivity of different metals with oxygen, water and acids as well as displacement reactions, the metals have been arranged in the decreasing order of their reactivities. This arrangement is known as activity series or reactivity series of metals. The basis of reactivity is the tendency of metals to lose electrons. If a metal can lose electrons easily to form positive ions, it will react readily with other substances. Therefore, it will be an active metal. On the other hand, if a metal loses electrons less rapidly to form a positive ion, it will react slowly with other substances. Therefore, such a metal will be less reactive.

i. Which of the following metal is less reactive than hydrogen?

- A. Copper
- B. Zinc
- C. Magnesium
- D. Lead

ii. Which of the following represents the correct order of reactivity for the given metals?

- A. $\text{Na} > \text{Mg} > \text{Al} > \text{Cu}$
- B. $\text{Mg} > \text{Na} > \text{Al} > \text{Cu}$
- C. $\text{Na} > \text{Mg} > \text{Cu} > \text{Al}$
- D. $\text{Mg} > \text{Al} > \text{Na} > \text{Cu}$

iii. Hydrogen gas is not evolved when a metal reacts with nitric acid. It is because HNO_3 is a strong oxidising agent. It oxidises the H_2 produced to water and itself gets reduced to any of the nitrogen oxides (N_2O , NO , NO_2). But _____ and _____ react with very dilute HNO_3 to evolve H_2 gas.

- A. Pb, Cu
- B. Na, K
- C. Mg, Mn
- D. Al, Zn

iv. Which of the following metals reacts vigorously with oxygen?

- A. Zinc
- B. Magnesium
- C. Sodium

D. Copper

VERY SHORT ANSWER TYPE QUESTIONS

Q.1. Name two metals which catch fire if kept in open air.

Q.2. Name the metals which can displace hydrogen from acid:-

Q.3. Which of the following metals neither reacts with cold nor with hot water?
Sodium, Magnesium, Zinc, Iron, Calcium

Q.4. Metals are electropositive in nature. Why?

Q.5. Name two metals which can form hydrides with hydrogen.

Q.6. Why does calcium start float when it reacts with water? Write the balanced chemical equation of the reaction.

Q.7. Name the element which shows non-metallic properties but is also present in the activity series of metals.

Q.8. What is rust? Write its chemical formula.

Q.9. How are alloys better than metals? Give composition of solder and amalgam.

Q.10. How do alloys brass and bronze differ in composition?

SHORT ANSWER QUESTIONS :-

1. Aluminium is a reactive metal but is still used for packing food articles. Give reason.
2. A non-metal X exists in different forms Y and Z. Y is the hardest natural substance, whereas Z is a good conductor of electricity. Identify X, Y and Z.
3. How does metal displace Hydrogen from acid. Give Chemical equation.
4. State reasons for the following:

(i) Electric wires are covered with rubber-like material.

(ii) From dilute hydrochloric acid, zinc can liberate hydrogen gas but copper cannot.

Explain the various methods of preventing Rusting.

5. Why some metal surfaces acquire a dull appearance when they are exposed to moist air? Write colour acquired by the surfaces of copper and silver in such situation and also write the chemical names of the substances due to which it happens.
6. Name any one metal which reacts neither with cold water nor with hot water, but reacts with heated steam to produce hydrogen gas.

7. Carbon cannot reduce the oxides of sodium, magnesium and aluminium to their respective metals. Why? Where are these metals placed in the reactivity series? How are these metals obtained from their ores? Take an example to explain the process of extraction along with chemical equations.

LONG ANSWER TYPE QUESTIONS

1. A metal E is stored under kerosene. When a small piece of it is left open in air, it catches fire. When the product formed is dissolved in water, it turns red litmus to blue.

(i) Name the metal E.

(ii) Write the chemical equation for the reaction when it is exposed to air and when the product is dissolved in water.

(iii) Explain the process by which the metal E is obtained from its molten chloride.

(a) Name the main ore of mercury. How is mercury obtained from its ore?

(b) Give balanced chemical equation.

(c) What is thermite reaction? How is it used to join the railway tracks or cracked machine parts?

(d) Name the method used to extract metals of high reactivity.

3. Explain the following:

(a) Reactivity of Al decreases if it is dipped in conc. HNO_3

(b) Carbon cannot reduce the oxides of Na or Mg.

(c) NaCl is not a conductor of electricity in solid state whereas it does conduct electricity in aqueous solution as in molten state

(d) Iron articles are galvanised.

ANSWERS:

ALSO TRY:

MULTIPLE CHOICE QUESTIONS

1b	2b	3c	4d	5a
6a	7c	8c	9c	10b
11d	15c	13b	14b	15c

16b	17b	18b	19d	20d
21b	22b	23a	24d	25d

ASSERTION AND REASON QUESTIONS

Question number	Answer
1	d
2	a
3	a
4	a
5	c
6	a
7	b
8	a
9	a
10	d

CASE STUDY QUESTIONS

1

i) a

ii) c

iii) c

iv) a

v) c

2

i) d

ii) a

iii) b

iv) a

3

i) a

ii) a

iii) b

iv) a

4

i) d

ii) c

iii) b

iv) d

v) b

5

i) a

ii) a

iii) c

iv) **VERY SHORT ANSWER TYPE QUESTIONS**

Q.1.Name two metals which catch fire if kept in open air.

Ans: Sodium and Potassium

Q.2. Name the metals which can displace hydrogen from acid:-

Ans: Metals that are more reactive than hydrogen displace it from acids

Eg:- Potassium, Sodium , Calcium, zinc etc.

**Q.3. Which of the following metals neither reacts with cold nor with hot water?
Sodium, Magnesium, Zinc, Iron, Calcium**

Ans: Zinc and Iron

Q.4. Metals are electropositive in nature. Why?

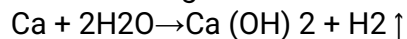
Metals are electropositive in nature because all metals lose electrons from their outermost shell in order to become stable and hence become positively charged.

Q.5. Name two metals which can form hydrides with hydrogen.

Ans: Sodium and Calcium

Q.6. Why does calcium start float when it reacts with water? Write the balanced chemical equation of the reaction.

Ans: Calcium reacts with cold water to form calcium hydroxide and hydrogen gas. The bubbles of hydrogen gas produced stick to the surface of calcium and hence, it starts floating on the surface of water.



Q.7. Name the element which shows non-metallic properties but is also present in the activity series of metals.

Ans: Hydrogen

Q.8. What is rust ? Write its chemical formula.

Ans: Rust is brown, flaky substance. Its chemical formula is $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$

Q.9. 12. How are alloys better than metals? Give composition of solder and amalgam.

Ans: Alloys are stronger than the metals from which they are made, more resistant to corrosion, have lower melting point, and have lower electrical conductivity. Solder is an alloy of lead and tin. An amalgam is an alloy of mercury with another metal.

Q.10. How do alloys brass and bronze differ in composition?

Ans: Constituents of brass are copper and zinc while those of bronze are copper and tin.

SHORT ANSWER QUESTIONS :-

- 1. Aluminium is a reactive metal but is still used for packing food articles. Give reason.**

Ans: Aluminium is a strong and cheap metal. It is also a good conductor of heat. But it is highly reactive. When it is exposed to moist air, its surface is covered with a thin impervious layer of aluminium oxide (Al_2O_3). This layer does not allow moist air to come in contact with the fresh metal and hence, protects the metal underneath from further damage or corrosion. Thus, after the formation of this protective layer of Al_2O_3 , aluminium becomes resistant to corrosion. It is because of this reason that although aluminium is a highly reactive metal, it is still used in food packaging.

2. **A non-metal X exists in different forms Y and Z. Y is the hardest natural substance, whereas Z is a good conductor of electricity. Identify X, Y and Z.**

Ans: X – Carbon, Y – Diamond, X – Graphite

3. **How does metal displace Hydrogen from acid. Give Chemical equation.**

Ans: Hydrogen is displaced by the metals from acids that are placed above hydrogen in the reactivity series of the metals. This is because these metals are more reactive than hydrogen.

Ex: Reaction of calcium with hydrochloric acid.

$\text{Ca} + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2$ Here, Hydrogen is displaced by Calcium from Hydrochloric acid.

4. **State reasons for the following:**

(i) **Electric wires are covered with rubber-like material.**

(ii) **From dilute hydrochloric acid, zinc can liberate hydrogen gas but copper cannot.**

Ans: (i) It is because rubber is an insulator and does not allow current to flow through it.

(ii) Zinc is placed above hydrogen in the reactivity series of metals while copper is placed below it. Metals placed above hydrogen can displace hydrogen from water and acids while those below it cannot. Therefore, zinc can displace hydrogen from dilute HCl whereas copper cannot.

5. **Explain the various methods of preventing Rusting.**

Ans: The various methods used for preventing the rusting of iron are given below:

(i) By applying paint : Materials like railings, iron gates, iron bridges, bodies of cars, buses and trucks, etc. are all painted to protect them from rusting. Painting the metal surface does not allow them to come in contact with the moist air and thus, prevents rusting.

(ii) Greasing and oiling: When some grease or oil is applied on the surface of an iron object, then moisture and air cannot come in contact with it and hence, rusting is prevented.

(iii) Galvanization: It is a method of protecting iron from rusting by coating them with a thin layer of zinc. The iron coated with zinc is called galvanized iron.

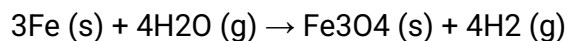
(iv) Electroplating: It is another technique used to prevent articles from rusting. In this process, metals like tin, nickel and chromium which do not corrode are electroplated on iron.

6. **Why some metal surfaces acquire a dull appearance when they are exposed to moist air? Write colour acquired by the surfaces of copper and silver in such situation and also write the chemical names of the substances due to which it happens.**

Ans: When a metal has been kept exposed to air for a long time, then it gets a dull appearance. The metals lose their shine or brightness due to the formation of a thin layer of oxide, carbonate or sulphide on their surface and thus, the metal surface gets corroded. The surface of copper gets coated with a green layer in moist air due to the formation of basic copper carbonate, silver articles acquire a blackish tinge due to the formation of silver sulphide.

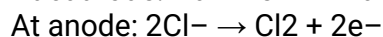
7. **Name any one metal which reacts neither with cold water nor with hot water, but reacts with heated steam to produce hydrogen gas.**

Ans: Iron



8. **Carbon cannot reduce the oxides of sodium, magnesium and aluminium to their respective metals. Why? Where are these metals placed in the reactivity series? How are these metals obtained from their ores? Take an example to explain the process of extraction along with chemical equations.**

Ans: Sodium, magnesium and aluminium have higher affinity towards oxygen than that of carbon because these are highly reactive metals. Hence, carbon cannot reduce the oxides of sodium, magnesium, and aluminium to their respective metals. These metals are placed at the top of the reactivity series. The highly reactive metals like Na, Mg, Al, etc. are extracted by electrolytic reduction of their molten chlorides or oxides. Electrolytic reduction is brought about by-passing electric current through the molten state. Metal gets deposited at the cathode.



LONG ANSWER TYPE QUESTIONS

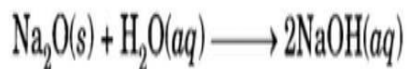
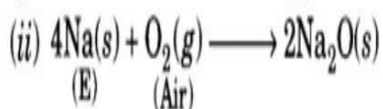
1. A metal E is stored under kerosene. When a small piece of it is left open in air, it catches fire. When the product formed is dissolved in water, it turns red litmus to blue.

(i) Name the metal E.

(ii) Write the chemical equation for the reaction when it is exposed to air and when the product is dissolved in water.

(iii) Explain the process by which the metal E is obtained from its molten chloride.

Ans: (i) The available information suggests that the metal (E) is sodium (Na).



The solution is basic and it turns red litmus blue.

(iii) The metal is obtained by the process of electrolytic reduction.

2. (a) Name the main ore of mercury. How is mercury obtained from its ore?

(b) Give balanced chemical equation.

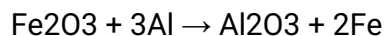
(c) What is thermite reaction? How is it used to join the railway tracks or cracked machine parts?

(d) Name the method used to extract metals of high reactivity.

Ans: (a) Cinnabar

(b) Mercury is obtained from its ore by roasting. $HgS + O_2 \rightarrow Hg + SO_2$

(c) When aluminium is heated with Fe_2O_3 to get molten iron, it is called thermite reaction.



Molten iron is used to weld broken railway tracks.

(d) Electrolytic reduction

3. Explain the following:

(a) Reactivity of Al decreases if it is dipped in conc. HNO_3

(b) Carbon cannot reduce the oxides of Na or Mg.

(c) NaCl is not a conductor of electricity in solid state whereas it does conduct electricity in aqueous solution as in molten state

(d) Iron articles are galvanised.

Ans: (a) When Al metal is dipped in conc. HNO_3 for sometime, it is oxidised initially to aluminium oxide (Al_2O_3). The oxide gets deposited on the surface of the metal and forms a protective coating on the surface. The metal is said to become passive towards air, acids and alkalies. Its reactivity therefore, decreases.

(b) Both Na and Mg are more reactive than carbon. Therefore, carbon is not in a position to reduce the oxides of these metals.

(c) NaCl is an ionic compound. Its electrical conductivity is due to the mobility of Na^+ and Cl^- ions. These ions cannot move in the solid state. However, they can do so either in molten state of the salt or when it forms an aqueous solution in water.

(d) Iron has a tendency to get rusted in atmosphere by reacting with oxygen and water vapours present in air. In order to check rusting, iron articles are generally coated with zinc. This process is known as galvanization.