

Metals and Non-Metals
Long Answer Type Questions

Q1. Explain the following:

- a. Reactivity of Al decreases if it is dipped in HNO_3
- b. Carbon cannot reduce the oxides of Na or Mg.
- c. NaCl is not a conductor of electricity in solid state.
- d. Iron articles are galvanised.
- e. Metals like Na, K, Ca and Mg are never found in their free state in nature.

Q2. How Zinc is extracted from its Sulphide (ZnS) and Carbonate ores (ZnCO_3)? Give examples with reactions.

Q3. a) When calcium metal is added to water, the gas evolved does not catch fire but the same gas evolved on adding potassium metal to water catches fire. Explain why?

b) Name a metal for each case:-

- i. It displaces hydrogen gas from nitric acid.
- ii. It does not react with any physical state of water.
- iii. It does not react with cold as well as hot water but reacts with steam.

Q4. a) Write steps involved in the extraction of pure metals in the middle of the activity series from their carbonate ores.

b) How is copper extracted from its sulphide ore? Explain the various steps supported by chemical equations. Draw labelled diagram for the electrolytic refining of copper.

Q5. Two ores A and B were taken. On heating ore A gives CO_2 whereas ore B gives SO_2 . What steps will you take to convert them into metals?

Q6. What are the various methods used for the refining of metals.

Q7. Differentiate between Ionic compounds and covalent compounds.

Q8. What is corrosion? How is it prevented?

Q9. Describe in detail electrolytic refining. Draw the necessary diagram.

Q10. Describe in detail the general properties of ionic compounds.

Q11. What is an ionic compound? Explain the formation of Sodium Chloride.

Q12. What is a covalent bond? Explain its types.

Q13. Explain the formation of MgO by transfer of electrons.

Q14. Draw the electron-dot structure of Methane.

Q15. Draw the electron-dot structure of the following compounds and state the type of bonding in each case

- i. CO_2 ii. MgO iii. H_2O iv. HCl v. CH_4

Very Short Answer Type Questions

- Q1. Which Gas is produced when dilute hydrochloric acid is added to a reactive metal? Write the chemical reaction when iron reacts with dilute H_2SO_4 .
- Q2. Why oxides of high reactive metals cannot be reduced by carbon?
- Q3. Write the chemical equations for the reaction taking place when steam is passed over hot aluminium.
- Q4. Differentiate between roasting and calcination.
- Q5. What is the difference between mineral and ore?
- Q6. Name a non-metal which is lustrous and a metal which is non-lustrous.
- Q7. Name the metals which melts when kept on palm.
- Q8. Why ionic compounds are having higher melting and boiling points ?
- Q9. Define the terms
i. Mineral ii. Ore iii. Gangue
- Q10. Define reactivity (or activity) series of metals.
- Q11. What is aqua-regia?
- Q12. What happens when iron nails are put into copper sulphate solution?
- Q13. Why is sodium kept immersed in kerosene oil?
- Q14. What is an alloy? In what ways alloys are better than constituting metals ?

Multiple Choice Questions

- Which is the most reactive metal
a) Zinc b) Iron c) Gold d) Silver
- Which of the following non-metals is a liquid
a) Carbon b) Sulphur c) Phosphorous d) Bromine
- Metal which has no action with water
a) Sodium b) Calcium c) Magnesium d) Gold
- The most abundant metal in the earth's crust is
a) Iron b) Aluminium c) Calcium d) Sodium
- The metal which is liquid at room temperature?
a) Mercury b) Silver c) Copper d) Aluminium
- Which of the following non-metal is lustrous
a) Sulphur b) Oxygen c) Nitrogen d) Iodine
- Galvanisation is a method of protecting iron from rusting by coating with a thin layer of
a) Galium b) Aluminium c) Zinc d) Silver
- Amalgam is an alloy of
a) Cu and Zn b) Metal and Mercury c) Na and K d) Iron and Carbon
- The flux used in blast furnace to remove the unwanted impurities is:-
a) Basic b) Acidic c) Neutral d) Amphoteric
- The non-metal which is a good conductor of electricity
a) Sulphur b) Phosphorous c) Graphite d) Iodine

11. In stainless steel, iron is mixed with
a) Ni and Cr b) Cu and Cr c) Ni and Cu d) Cu and Au
12. The Bronze medals are made up of
a) Cu and Zn b) Zn and Ni c) Cu and Sn d) Cu, Zn, Tn
13. Which of the given metals cannot be extracted using smelting
a) Fe b) Al c) Zn d) Pb
14. Which of the following is an iron ore
a) Cinnabar b) Calamine c) Haematite d) Rock salt
15. Which is the most malleable metal
a) Au b) Pb c) Fe d) Cu

Q. Read the following and answer any four questions

The eating away of upper layers of a metal due to the action of air and moisture is called corrosion.

1. Name the metal which
- becomes blackish after certain time
 - develops green coating on exposure to air.
 - does not corrode at all.
 - is used in making steel.
 - is non-lustrous.

The branch of science which deals with the extraction of metals is called as metallurgy and the various steps involved in the extraction of metals are called as metallurgical operations.

2. Explain the following terms:-
- Concentration of ore
 - Roasting
 - Calcination
 - Gangue or Matrix
 - Flux

Assertion (A) and Reasoning (R) Type Questions

Two statements (Assertion-A and Reason-R) are given. Select the correct answer to these questions from codes a, b, c and d as given below.

- a. Both A and R are true and R is correct explanation of the assertion.
 - b. Both A and R are true and R is not the correct explanation of the assertion.
 - c. A is true but R is false.
 - d. A is false but R is true.
1. Assertion: Some metal oxides such as aluminium oxide, zinc oxide show both acidic as well as basic behaviour.
Reason: The oxide which react with acid as well as with base are called amphoteric oxide.
 2. Assertion: Potassium and sodium are kept immersed in Kerosene oil.
Reason: Potassium and sodium react vigorously they may catch fire if kept in the open.
 3. Assertion: The elements or compounds which occur naturally in the Earth's crust are known as minerals.
Reason: Those minerals from which metals can be extracted conveniently and profitably are called as ores.