

CBSE CLASS X
Science (086)**QUESTION PAPER***From previous CBSE Board Exam questions***Code: XJEXJE Questions: 80 Maximum Marks: 158 Generated: 2026-06-15 13:05****SELECTIONS USED**

Source	Previous-year board
Subject	Science
Lessons	Metals and Non-metals
Year	2022-2026
Questions selected	80

Composition — Types: 35 MCQ · 23 Short · 9 source_based · 8 Assertion-reason · 5 Very short · 4 Long

Q1. § 1.1 CHEMICAL EQUATIONS**[1]**

A metal ribbon 'X' burns in oxygen with a dazzling white flame forming a white ash 'Y'. The correct description of X, Y and the type of reaction is :

- (a) X = Ca ; Y = CaO ; Type of reaction = Decomposition
- (b) X = Mg ; Y = MgO ; Type of reaction = Combination
- (c) X = Al ; Y = Al₂O₃ ; Type of reaction = Thermal decomposition
- (d) X = Zn ; Y = ZnO ; Type of reaction = Endothermic

Previously asked in: 2023 31/4/1 Q3

♦ Chemical Reactions and Equations

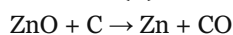
Burning of Magnesium Ribbon – Observations and Characteristics

Reaction of Magnesium with Oxygen – Combustion and Product Identification

Types of chemical reactions – combination and oxidation

Q2. § 1.1.2 Balanced Chemical Equations**[1]**

Assertion (A) : In the following reaction



ZnO undergoes reduction.

Reason (R) : Carbon is a reducing agent that reduces ZnO to Zn.

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

Previously asked in: 2023 31/5/1 Q17

♦ Chemical Reactions and Equations

Oxidation and Reduction – Identifying Reducing Agent in a Redox Reaction

Oxidation and reduction (redox reactions)

Reduction of Metal Oxides with Carbon (Coke)

Q3. § 2.1 UNDERSTANDING THE CHEMICAL PROPERTIES OF ACIDS AND BASES § 2.2 WHAT DO ALL ACIDS AND ALL BASES HAVE IN COMMON? [1]

In the experimental setup given below, it is observed that on passing the gas produced in the reaction in the solution 'X' the solution 'X' first turns milky and then colourless. The option that justifies the above stated observation is that 'X' is aqueous calcium hydroxide and

- (a) it turns milky due to carbon dioxide gas liberated in the reaction and after sometime it becomes colourless due to formation of calcium carbonate.
- (b) it turns milky due to formation of calcium carbonate and on passing excess of carbon dioxide it becomes colourless due to formation of calcium hydrogen carbonate which is soluble in water.
- (c) it turns milky due to passing of carbon dioxide through it. It turns colourless as on further passing carbon dioxide, sodium hydrogen carbonate is formed which is soluble in water.
- (d) the carbon dioxide liberated during the reaction turns lime water milky due to formation of calcium hydrogen carbonate and after some time it turns colourless due to formation of calcium carbonate which is soluble in water.

Previously asked in: 2023 31/1/1 Q1

♦ **Acids, Bases and Salts** CO₂ gas turning lime water milky then colourless (excess CO₂ forming soluble calcium bicarbonate)
Reaction of Ca(OH)₂ solution with CO₂ – lime water test Reaction of acids with carbonates

Q4. § 3.1 PHYSICAL PROPERTIES [1]

Among the following, the metal with lowest density is :

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

Previously asked in: 2023 31/2/1 Q5

♦ **Metals and Non-metals** Physical properties of metals – density

Q5. § Chapter Introduction § 3.3 HOW DO METALS AND NON-METALS REACT? [1]

Reaction between two elements A and B, forms a compound C. A loses electrons and B gains electrons. Which one of the following properties will not be shown by compound C ?

- (A) It has high melting point.
- (B) It is highly soluble in water.
- (C) It has weak electrostatic forces of attraction between its oppositely charged ions.
- (D) It conducts electricity in its molten state or aqueous solution.

Previously asked in: 2025 31/1/1 Q5

♦ **Metals and Non-metals** Properties of Ionic Compounds

Q6. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS § 3.5 CORROSION [1]

During electrolytic refining of copper, the anode, the cathode and the electrolyte used respectively are

- A Impure copper, pure copper, acidified copper sulphate solution
- B Pure copper, impure copper, sulphuric acid
- C Pure copper, impure copper, acidified copper sulphate solution
- D Impure copper, pure copper, distilled water

Previously asked in: 2025 31/5/1 Q6

♦ **Metals and Non-metals** Electrolytic Refining of Metals

Q7. § 3.1 PHYSICAL PROPERTIES § 3.5 CORROSION**[1]**

Answer the following: Name the method used for refining silver.

Previously asked in: 2025 31/2/1 Q21 (b)

♦ **Metals and Non-metals** Electrolytic Refining of Metals**Q8.** § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS**[4]**

The metals produced by various reduction processes are not very pure. They contain impurities, which must be removed to obtain pure metals. The most widely used method for refining impure metals is electrolytic refining.

Read the source given and answer the questions that follow :

(i) What is the cathode and anode made of in the refining of copper by this process ? [1]

(ii) Name the solution used in the above process and write its formula. [1]

(iii) How copper gets refined when electric current is passed in the electrolytic cell ? [2]

Previously asked in: 2024 31/1/1 Q37

♦ **Metals and Non-metals** Electrolytic Refining of Metals**Q9.** § 3.1 PHYSICAL PROPERTIES**[1]**

The property by virtue of which a solid material can be drawn into thin wires is called :

- (a) malleability
- (b) ductility
- (c) rigidity
- (d) resistivity

Previously asked in: 2025 31/4/1 Q3

♦ **Metals and Non-metals** Ductility of Metals**Q10.** § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS**[3]**

Design an activity to show that metals are good conductors of heat and have high melting points.

Previously asked in: 2025 31/4/1 Q28

♦ **Metals and Non-metals** Physical properties of metals – thermal conductivity and high melting points**Q11.** § 3.2 CHEMICAL PROPERTIES OF METALS**[1]**

The products formed when Aluminium and Magnesium are burnt in the presence of air respectively are :

- (A) Al_3O_4 and MgO_2
- (B) Al_2O_3 and MgO
- (C) Al_3O_4 and MgO
- (D) Al_2O_3 and MgO_2

Previously asked in: 2025 31/1/1 Q2

♦ **Metals and Non-metals** Reactions of Metals with Oxygen (Burning in Air)**Q12.** § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS**[3]**

Draw a labelled diagram to show electrolytic refining of copper. State what happens when electric current is passed through the electrolyte taken in this case.

Previously asked in: 2024 31/2/1 Q28

♦ **Metals and Non-metals** Electrolytic Refining of Metals (Copper)

Q13. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS

State reasons for the following : Sodium metal is stored in bottle filled with kerosene oil.

Previously asked in: 2024 31/3/1 Q27 (b)

♦ **Metals and Non-metals**

Reactivity of Sodium with Air and Water – Storage of Sodium in Kerosene Oil

Q14. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? **[3]**

Answer the following about ionic compounds.

- (a) Show the formation of Aluminium Nitride (AlN) by the transfer of electrons. [At. no. of Al = 13; At. no. of N = 7]
- (b) "Ionic compounds are solids and are generally brittle and break into pieces when pressure is applied." Give reason to justify the statement.

Previously asked in: 2025 31/5/1 Q28 (B)

♦ **Metals and Non-metals**

Formation of ionic compounds by electron transfer

Properties of ionic compounds – solid, brittle nature

Q15. § 3.3 HOW DO METALS AND NON-METALS REACT? **[1]**

The number of electrons in the outermost shell of the atom of a non-metal can be :

- (a) 1, 2 or 3
(b) 3, 4 or 5
(c) 5, 6 or 7
(d) 5, 6 or 8

Previously asked in: 2023 31/2/1 Q6

♦ **Metals and Non-metals**

Electronic configuration of non-metals and valence electrons

Q16. § 3.3 HOW DO METALS AND NON-METALS REACT? **[2]**

Show the formation of the following ionic compounds by transfer of electrons between the combining atoms :

(Given : Atomic number : Na = 11, Mg = 12, O = 8, Cl = 17)

- (i) Sodium oxide (Na₂O) [1]
(ii) Magnesium chloride (MgCl₂) [1]

Previously asked in: 2026 31/3/1 Q25

♦ **Metals and Non-metals**

Electronic configuration and valency of Na, Mg, O, Cl

Formation of ionic compounds by electron transfer

Q17. § 3.3 HOW DO METALS AND NON-METALS REACT? **[1]**

Assertion (A) : Hydrogen gas is not evolved when zinc reacts with nitric acid.

Reason (R) : Nitric acid oxidises the hydrogen gas produced to water and itself gets reduced.

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

Previously asked in: 2024 31/1/1 Q17

♦ **Metals and Non-metals**

Reaction of metals with nitric acid – no hydrogen gas evolution

Q18. § 3.2 CHEMICAL PROPERTIES OF METALS**[4]**

The melting points and boiling points of some ionic compounds are given below :

Compound	Melting Point (K)	Boiling Point (K)
NaCl	1074	1686
LiCl	887	1600
CaCl ₂	1045	1900
CaO	2850	3120
MgCl ₂	981	1685

These compounds are termed ionic because they are formed by the transfer of electrons from a metal to a non-metal. The electron transfer in such compounds is controlled by the electronic configuration of the elements involved. Every element tends to attain a completely filled valence shell of its nearest noble gas or a stable octet.

Read the following and answer the questions:

- (i) Show the electron transfer in the formation of magnesium chloride. [1]
- (ii) List two properties of ionic compounds other than their high melting and boiling points. [1]
- (iii) Answer (A) or (B): [2]

Previously asked in: 2023 31/4/1 Q37

♦ Metals and Non-metals

Electron transfer in formation of ionic compounds (MgCl₂)

Ionic compounds – melting and boiling points

Properties of Ionic Compounds

Q19. § 3.3 HOW DO METALS AND NON-METALS REACT?**[3]**

Write the electron-dot structures of (i) sodium, and (ii) oxygen. Using these structures, show the formation of sodium oxide. Mark the anion and cation present in this compound.

(At. No. – Sodium = 11 and Oxygen = 8)

Previously asked in: 2025 31/2/1 Q28

♦ Metals and Non-metals

Electron-dot (Lewis) structures of sodium and oxygen

Formation of ionic compound – sodium oxide (Na₂O)**Q20.** § 3.3 HOW DO METALS AND NON-METALS REACT?**[1]**

Assertion (A) : Hydrogen gas is not evolved when a metal reacts with nitric acid.

Reason (R) : Nitric acid is a strong reducing agent and reduces the hydrogen produced in the reaction to water.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 31/3/1 Q17

♦ Metals and Non-metals

Reaction of metals with nitric acid – no hydrogen gas evolution

Q21. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT?**[1]**

Which gas is evolved when magnesium metal reacts with very dilute HNO_3 ?

- (A) Oxygen
- (B) Nitrogen
- (C) Hydrogen
- (D) Nitrogen Dioxide

Previously asked in: 2026 31/5/1 Q23

♦ **Metals and Non-metals** Reaction of metals with dilute nitric acid (evolution of H_2 gas)

Reaction of metals with nitric acid – no hydrogen gas evolution

Q22. § 3.3 HOW DO METALS AND NON-METALS REACT?

State reasons for the following : In the reactions of nitric acid with metals, generally hydrogen gas is not evolved.

Previously asked in: 2024 31/3/1 Q27 (c)

♦ **Metals and Non-metals** Reaction of metals with nitric acid – no hydrogen gas evolution

Q23. § 3.3 HOW DO METALS AND NON-METALS REACT?**[2]**

Show the formation of magnesium chloride by electron transfer. Write the name of the cation and anion present in the compound formed. (Atomic Number of Mg = 12, Cl = 17)

Previously asked in: 2025 31/4/1 Q22(A)

♦ **Metals and Non-metals** Cations and Anions in Ionic Compounds Formation of ionic compounds by electron transfer

Q24. § 3.4 OCCURRENCE OF METALS**[3]**

Name the ore of mercury and state the form in which it is found in nature. Write the chemical equations along with the condition required for the reactions involved in the extraction of mercury from its ore.

Previously asked in: 2024 31/5/1 Q28

♦ **Metals and Non-metals** Extraction of metals from sulphide ores – Mercury (Cinnabar/ HgS)

Q25. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS**[4]**

An electrochemical process is used for refining metals by selectively dissolving and depositing them through electrolysis. Electrolytic refining is used for metals like Copper, Zinc, Tin, Nickel, Silver and Gold.

Read the following passage and answer the questions that follow :

- (a) Define anode mud. [1]
- (b) In electrolytic refining of copper, name the anode and the cathode. [1]
- (c) With the help of chemical equations, show the extraction of copper from its ore Cu_2S . [2]

Previously asked in: 2026 31/3/1 Q28

♦ **Metals and Non-metals** Electrolytic Refining of Metals Extraction of Copper from Cu_2S (Copper Glance)

Q26. § 3.4 OCCURRENCE OF METALS

[4]

Most of metals occur in combined state in form of ores. Carbonate ores are converted into oxides by calcination and sulphide ores by roasting. Oxides are reduced with suitable reducing agent like carbon to get free metal. Highly reactive metals like – Al, Mg are also used as reducing agents to obtain metal from their oxides. Most reactive metals are obtained by electrolytic reduction of their molten ores. Alloying is a very good method of improving the properties of a metal. We can get desired properties by this method. The electrical conductivity and melting point of an alloy is less than that of pure metals.

Read the following passage and answer the questions given below :

- (a) Why carbonate or sulphide ores are converted to oxides before extraction of metal from it ? [1]
(b) Write a reaction in which Aluminium is used as a reducing agent to obtain metal from its oxide. [1]
(c) How is copper obtained from its ore (Cu_2S) ? Give equations of the reactions. [2]

Previously asked in: 2026 31/1/1 Q28

♦ Metals and Non-metals

Metallurgy: extraction of metals from ores (calcination, roasting, reduction)

Q27. § 3.4 OCCURRENCE OF METALS

[1]

The most common method of extraction of metals from their oxide ores is :

- (A) Reduction with carbon
(B) Reduction with hydrogen
(C) Reduction with aluminium
(D) Electrolytic reduction

Previously asked in: 2025 31/3/1 Q3

♦ Metals and Non-metals

Extraction of Metals from Oxide Ores by Reduction

Q28. § 3.4 OCCURRENCE OF METALS

[1]

The metals which are found in both free state as well as combined state are :

- A Gold and platinum
B Platinum and silver
C Copper and silver
D Gold and silver

Previously asked in: 2024 31/4/1 Q4

♦ Metals and Non-metals

Occurrence of Metals – Free State and Combined State

Q29. § 3.4 OCCURRENCE OF METALS

[1]

Assertion (A) : The extraction of metals from their sulphide ores cannot take place without roasting of the ore.

Reason (R) : Roasting converts sulphide ores directly into metals.

- A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2024 31/4/1 Q17

♦ Metals and Non-metals

Roasting of Sulphide Ores

Q30. § 3.1 PHYSICAL PROPERTIES § 3.4 OCCURRENCE OF METALS**[3]**

State giving reason the reduction process to obtain the following metals from their compounds : (i) Mercury, (ii) Copper and (iii) Sodium

Previously asked in: 2024 31/3/1 Q28(a)

♦ **Metals and Non-metals**

Extraction of Copper by reduction with carbon/self-reduction

Extraction of Mercury by thermal decomposition of HgS/HgO

Extraction of Sodium by electrolytic reduction

Extraction of metals by reduction (thermal decomposition, reduction with carbon, electrolytic reduction)

Q31. § 3.5 CORROSION**[3]**

Observe the following diagram showing an experiment to determine the conditions under which a metal 'M' corrodes. List your observations in each of the three cases A, B and C with reason, if the metal 'M' is generally protected against corrosion by the method of galvanisation.

Previously asked in: 2025 31/5/1 Q28 (A)

♦ **Metals and Non-metals**

Corrosion – conditions and prevention by galvanisation

Q32. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.5 CORROSION**[3]**

It is observed that Calcium on reaction with water floats on its surface. Explain why it happens. Also write a balanced chemical equation for the reaction that occurs. What happens when the aqueous solution of the product of this reaction reacts with Carbon dioxide gas ? Write a balanced chemical equation for the reaction.

Previously asked in: 2024 31/2/1 Q27

♦ **Metals and Non-metals**

Balanced chemical equation for reaction of Calcium with Water

Reaction of $\text{Ca}(\text{OH})_2$ solution with CO_2 – lime water test

Reaction of Calcium with Water – floating due to heat and gas evolved

Q33. § 3.4 OCCURRENCE OF METALS § 3.5 CORROSION**[5]**

Answer the following :

(i) With the help of balanced chemical equations state the process of extracting (I) mercury from its ore called cinnabar, and (II) copper from its sulphide ore. [3]

(ii) Silver and copper articles slowly lose their shiny surfaces when exposed to air. Name the compounds formed on (I) silver articles, and (II) copper articles in the form of coating. [2]

Previously asked in: 2025 31/3/1 Q34(b)

♦ **Metals and Non-metals**

Corrosion of silver and copper – tarnishing and coating compounds

Extraction of metals from sulphide ores (cinnabar and copper sulphide) with balanced equations

Q34. § 3.2 CHEMICAL PROPERTIES OF METALS**[3]**

State giving reason for the change in appearance observed when each of the following metal is exposed to atmospheric air for some time : (i) Silver, (ii) Copper and (iii) Iron

Previously asked in: 2024 31/3/1 Q28(b)

♦ **Metals and Non-metals**

Corrosion of metals in atmospheric air

Green patina formation on Copper

Rusting of Iron

Tarnishing of Silver

Q35. § 3.2 CHEMICAL PROPERTIES OF METALS

[1]

A metal is used in the thermite process. When heated with air, it gives an oxide which is amphoteric in nature. The metal and its oxide are respectively :

- (A) Mn, MnO₂
- (B) Al, Al₂O₃
- (C) Fe, Fe₂O₃
- (D) Mg, MgO

Previously asked in: 2024 31/5/1 Q5

♦ Metals and Non-metals

Amphoteric oxides of metals

Thermite process and aluminium

Q36. § 3.2 CHEMICAL PROPERTIES OF METALS

[1]

When Mg metal is treated with hot water, it starts floating on the surface of the water. The reason for its different behaviour is :

- (A) Mg is a lighter element than water.
- (B) Mg reacts with water to produce H₂ gas which helps in floating.
- (C) Mg reacts with water to produce N₂ gas which helps in floating.
- (D) Mg reacts with water to form CO₂ gas which helps in floating.

Previously asked in: 2026 31/2/1 Q20

♦ Metals and Non-metals

Reactivity of Metals with Water – Mg floating due to H₂ gas evolution**Q37.** § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS

[3]

Attempt either (a) or (b) :

- (a)
- (i) Write one example each of one metal that is so soft that it can be cut with a knife, and one non-metal that is a good conductor of electricity.
 - (ii) Using the electronic configuration, explain how Mg atom combines with oxygen to form magnesium oxide by transfer of electrons. [Atomic number : Mg = 12, O = 8]

Previously asked in: 2026 31/2/1 Q26 (a)

♦ Metals and Non-metals

Ionic bond formation by electron transfer – Magnesium Oxide (MgO)

Physical properties of metals and non-metals (softness, electrical conductivity)

Q38. § 3.4 OCCURRENCE OF METALS

[3]

Attempt either (a) or (b) :

(b) Give reasons :

- (i) Metal sulphides and carbonates should be converted to their metal oxides in the process of extraction of metals. [1]
- (ii) Aluminium oxide is considered as an amphoteric oxide. [1]
- (iii) Metals like Na, K, Ca and Mg are never found in their free state in nature. [1]

Previously asked in: 2026 31/2/1 Q26 (b)

♦ Metals and Non-metals

Amphoteric nature of aluminium oxide

Conversion of metal sulphides and carbonates to metal oxides (roasting and calcination)

Highly reactive metals never found in free state in nature

Q39. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS [1]

A metal, M, displaces iron from aqueous solution of ferrous sulphate but fails to do so in case of aqueous solution of aluminium sulphate. The metal M is

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

Previously asked in: 2025 31/5/1 Q2

♦ Metals and Non-metals Reactivity Series and Displacement Reactions of Metals

Q40. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? [1]

A metal, 'X', on treatment with sodium hydroxide liberates a gas 'G'. It also liberates the same gas, 'G' on treatment with dilute sulphuric acid. Based on above information, 'X' and 'G' respectively are

- A Copper and Sulphur dioxide
- B Zinc and Sulphur dioxide
- C Zinc and Hydrogen
- D Copper and Hydrogen

Previously asked in: 2025 31/5/1 Q4

♦ Metals and Non-metals Amphoteric metals reacting with acids and bases to liberate hydrogen gas

Q41. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? [4]

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.

Read the passage and answer the following:

- (a) What happens when copper is heated in air ? (Give the equation of the reaction involved). [1]
- (b) Why are some metal oxides categorized as amphoteric ? Give one example. [1]
- (c) Complete the following equations : (i) $\text{Na}_2\text{O}_{(s)} + \text{H}_2\text{O}_{(l)} \rightarrow$ (ii) $\text{Al}_2\text{O}_3 + 2 \text{NaOH} \rightarrow$ [2]

Previously asked in: 2023 31/1/1 Q37

♦ Metals and Non-metals Amphoteric oxides Reaction of metals with oxygen – formation of metal oxides
Reactions of metal oxides with water and bases

Q42. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS [1]

Metal oxides generally react with acids, but few oxides of metal also react with bases. Such metallic oxides are :

- I. MgO
- II. ZnO
- III. Al₂O₃
- IV. CaO

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

Previously asked in: 2023 31/6/1 Q1

♦ **Metals and Non-metals** Amphoteric oxides of metals (ZnO, Al₂O₃)

Q43. § 3.1 PHYSICAL PROPERTIES § 3.4 OCCURRENCE OF METALS § 3.5 CORROSION [1]

Bronze is an alloy of

- (a) Copper and Zinc
- (b) Aluminium and Tin
- (c) Copper, Tin and Zinc
- (d) Copper and Tin

Previously asked in: 2023 31/6/1 Q8

♦ **Metals and Non-metals** Alloys and their composition

Q44. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS [1]

When zinc reacts with sodium hydroxide, the product formed is :

- (a) Sodium oxide
- (b) Sodium zincate
- (c) Zinc hydroxide
- (d) Zinc oxide

Previously asked in: 2023 31/2/1 Q4

♦ **Metals and Non-metals** Reaction of Metals with Bases (Amphoteric Metals)

Q45. [1]

The reaction of calcium with cold water is :

- (A) Less violent, but the heat evolved is sufficient for the hydrogen to catch fire.
- (B) Very violent and exothermic and hydrogen catches fire.
- (C) Exothermic, but the heat evolved is not sufficient for the hydrogen to catch fire.
- (D) Slow and endothermic.

Previously asked in: 2026 31/3/1 Q21

♦ **Metals and Non-metals** Reactivity of Metals with Water (Calcium with Cold Water)

Q46. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS [1]

When zinc reacts with NaOH, the product formed is :

- (A) Na_2O
- (B) ZnO
- (C) Na_2ZnO_2
- (D) Zn(OH)_2

Previously asked in: 2026 31/3/1 Q23

♦ Metals and Non-metals Reaction of Metals with Bases (Amphoteric Metals)

Q47. § 3.3 HOW DO METALS AND NON-METALS REACT? [1]

Assertion (A) : Sodium oxide is an amphoteric oxide.

Reason (R) : Metal oxides which react with both acids as well as bases are known as amphoteric oxides.

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

Previously asked in: 2023 31/2/1 Q17

♦ Metals and Non-metals Amphoteric oxides

Q48. § 3.2 CHEMICAL PROPERTIES OF METALS [2]

Answer the following:

(b)(i) When copper powder is heated in a watch glass, a black substance is formed. Why is this black substance formed ? Name it. [1]

(b)(ii) How can this black substance be reversed to its original form ? [1]

Previously asked in: 2023 31/2/1 Q21 (b)

♦ Metals and Non-metals Oxidation of Copper to Copper Oxide (CuO) Reduction of Copper Oxide back to Copper using Hydrogen gas

Q49. § 3.2 CHEMICAL PROPERTIES OF METALS [3]

A metal 'M' on reacting with dilute acid liberates a gas 'G'. The same metal also liberates gas 'G' when reacts with a base.

- (i)** Write the name of gas 'G'.
- (ii)** How will you test the presence of this gas ?
- (iii)** Write chemical equations for the reactions of the metal with (1) an acid and (2) a base.

Previously asked in: 2023 31/6/1 Q28(b)

♦ Metals and Non-metals Amphoteric metals reacting with acids and bases (e.g., Aluminium/Zinc)
Chemical equations for reactions of metals with dilute acids and bases Hydrogen gas — identification test (burning with a pop sound)

Q50. § 3.2 CHEMICAL PROPERTIES OF METALS [1]

The formation of magnesium oxide is correctly shown in option :

- (A) [Electron dot / ionic structure diagram for option A]
- (B) [Electron dot / ionic structure diagram for option B]
- (C) [Electron dot / ionic structure diagram for option C]
- (D) [Electron dot / ionic structure diagram for option D]

Previously asked in: 2025 31/1/1 Q7

♦ Metals and Non-metals Electronic configuration and valency of Na, Mg, O, Cl
Ionic bond formation by electron transfer – Magnesium Oxide (MgO) Reaction of metals with oxygen – formation of metal oxides

Q51. § 3.4 OCCURRENCE OF METALS**[4]**

On the basis of reactivity metals are grouped into three categories –

- (i) Metals of low reactivity
- (ii) Metals of medium reactivity
- (iii) Metals of high reactivity

Therefore metals are extracted in pure form from their ores on the basis of their chemical properties.

Metals of high reactivity are extracted from their ores by electrolysis of the molten ore.

Metals of low reactivity are extracted from their sulphide ores, which are converted into their oxides. The oxides of these metals are reduced to metals by simple heating.

Answer the sub-parts based on the given passage about extraction of metals.

- (a) Name the process of reduction used for a metal that gives vigorous reaction with air and water both.
- (b) Carbon cannot be used as a reducing agent to obtain aluminium from its oxide ? Why ?
- (c) Describe briefly the method to obtain mercury from cinnabar. Write the chemical equation for the reactions involved in the process.

Previously asked in: 2023 31/6/1 Q37

- ♦ **Metals and Non-metals** Electrolytic reduction of highly reactive metals (e.g., sodium, potassium, aluminium)
- Extraction of Metals Based on Reactivity Series Extraction of mercury from cinnabar (thermal reduction / roasting)
- Why carbon cannot reduce aluminium oxide

Q52. § 3.3 HOW DO METALS AND NON-METALS REACT?**[2]**

The atomic number of an element 'X' is 11.

- (i) Write the electronic configurations of X and find its valency.
- (ii) Write the formula and nature of its oxide.

Previously asked in: 2022 31/2/1 Q2

- ♦ **Metals and Non-metals** Electronic configuration and valency of metals Oxides of metals – formula and nature

Q53. § 3.4 OCCURRENCE OF METALS**[3]**

Answer the following :

- (a) "Displacement reactions also play a key role in extracting metals in the middle of the reactivity series." Justify this statement with two examples. [2]
- (b) Why can metals high up in the reactivity series not be obtained by reduction of their oxides by carbon ? [1]

Previously asked in: 2025 31/1/1 Q27(a)

- ♦ **Metals and Non-metals** Displacement reactions in extraction of metals (middle of reactivity series)
- Reactivity series and limitations of carbon reduction for highly reactive metals

Q54. § Chapter Introduction § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS**[4]**

Many pure metals like copper, iron and gold are very soft and as such are considered unsuitable for certain uses. Metallic objects around us such as cooking utensils, statues, ornaments, guns etc. are actually not made up of pure metals. Instead of pure metals, alloys are used in the design of most of the useful objects. Making alloys enhances the basic properties of a metal which is the primary constituent (metal) of an alloy.

Read the source and answer the sub-parts that follow.

- (I) How does electrical conductivity and melting point of a metal change when it is converted to its alloy by mixing a small amount of an element in it ? [1]
- (II) Name an alloy used for welding two wires together in an electric circuit. Write its major constituents. [1]
- (III) Answer either (a) or (b). [2]

Previously asked in: 2025 31/6/1 Q37

♦ **Metals and Non-metals** Alloys – properties, composition and uses

Q55. § 3.2 CHEMICAL PROPERTIES OF METALS**[3]**

Answer the following :

- (i) Name two metals which react violently with cold water. List any three observations which a student notes when these metals are dropped in a beaker containing water. [2]
- (ii) Write a test to identify the gas evolved (if any) during the reaction of these metals with water. [1]

Previously asked in: 2025 31/1/1 Q28(b)

♦ **Metals and Non-metals** Reactivity of metals with water – violent reaction of alkali metals (Na, K) with cold water
Test for hydrogen gas evolved during metal-water reaction

Q56. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS**[1]**

When 2 mL of sodium hydroxide solution is added to few pieces of granulated zinc in a test tube and then warmed, the reaction that occurs can be written in the form of a balanced chemical equation as :

- (a) $\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2\text{O}$
(b) $2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$
(c) $2\text{NaOH} + \text{Zn} \rightarrow \text{NaZnO}_2 + \text{H}_2$
(d) $2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2\text{O}$

Previously asked in: 2024 31/1/1 Q1

♦ **Metals and Non-metals** Amphoteric oxides of metals (ZnO , Al_2O_3)
Reaction of zinc with sodium hydroxide – balanced chemical equation

Q57. § Chapter Introduction § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS**[1]**

A metal and a non-metal that exists in liquid state at the room temperature are respectively :

- (a) Bromine and Mercury
(b) Mercury and Iodine
(c) Mercury and Bromine
(d) Iodine and Mercury

Previously asked in: 2024 31/1/1 Q3

♦ **Metals and Non-metals** Physical states of metals and non-metals at room temperature

Q58. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS**[1]**

Oxides of aluminium and zinc are :

- (a) acidic
- (b) basic
- (c) amphoteric
- (d) neutral

Previously asked in: 2024 31/1/1 Q6

♦ **Metals and Non-metals** Amphoteric oxides

Q59. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS**[1]**

When an element 'X' reacts with water, it starts floating. Identify the element 'X' :

- A Potassium
- B Calcium
- C Sodium
- D Iron

Previously asked in: 2026 31/1/1 Q23

♦ **Metals and Non-metals** Reaction of Metals with Water

Q60.**[1]**

Answer the following : What are amphoteric oxides ?

Previously asked in: 2026 31/1/1 Q25 (a)

♦ **Metals and Non-metals** Amphoteric oxides

Q61. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS**[1]**

Aluminium powder is used in thermit welding because :

- (A) Its reaction with iron is highly exothermic.
- (B) When it is heated with iron (III) oxide, molten iron is obtained.
- (C) When it is heated with iron (III) oxide, molten aluminium oxide is obtained to join railway tracks.
- (D) Its melting point is low as compared to iron and a molten alloy of iron and aluminium is formed on heating which is used to join railway tracks.

Previously asked in: 2025 31/2/1 Q4

♦ **Metals and Non-metals** Thermit Reaction and Reactivity of Aluminium

Q62. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS**[1]**

Two metals zinc and tin are dissolved separately in definite proportions in molten copper (the primary metal) to obtain two different alloys respectively known as :

- (A) Bronze and Brass
- (B) Brass and Solder
- (C) Brass and Bronze
- (D) Solder and Bronze

Previously asked in: 2025 31/2/1 Q5

♦ **Metals and Non-metals** Alloys of Metals (Brass and Bronze)

Q63. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT?**[1]**

Which of the following statements is true for an amphoteric oxide ?

- (a) It reacts only with acid and does not form water.
- (b) It reacts with acid as well as base to form salt and hydrogen gas.
- (c) It reacts with both acid as well as base to form salt and water.
- (d) It reacts only with base and does not form water.

Previously asked in: 2023 31/5/1 Q5

♦ Metals and Non-metals Amphoteric oxides

Q64. § 3.1 PHYSICAL PROPERTIES § 3.4 OCCURRENCE OF METALS § 3.5 CORROSION**[1]**

Consider the following cases :

- (a) $\text{CaSO}_4 + \text{Al} \rightarrow$
- (b) $\text{CuSO}_4 + \text{Ca} \rightarrow$
- (c) $\text{FeSO}_4 + \text{Cu} \rightarrow$
- (d) $\text{ZnSO}_4 + \text{Mg} \rightarrow$

The cases in which new products will form are –

- (A) (a) and (b)
- (B) (b) and (c)
- (C) (c) and (d)
- (D) (b) and (d)

Previously asked in: 2024 31/2/1 Q5

♦ Metals and Non-metals Reactivity Series and Displacement Reactions of Metals

Q65. § 3.4 OCCURRENCE OF METALS**[1]**

Assertion (A) : Different metals have different reactivities with water and dilute acids.

Reason (R) : Extraction of a metal from its ore depends on its position in the reactivity series.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.

Previously asked in: 2024 31/2/1 Q17

♦ Metals and Non-metals Extraction of Metals Based on Reactivity Series Reactivity Series of Metals

Q66. § 3.4 OCCURRENCE OF METALS

[4]

Metals are required for a variety of purposes. For this we need their extraction from their ores. Ores mined from the earth are usually contaminated with many impurities which must be removed prior to the extraction of metals. The extraction of pure metal involves the following steps :

- (1) Concentration of ore
- (2) Extraction of the metal from the concentrated ore
- (3) Refining of the metal

Read the case carefully and answer the questions that follow.

- (a) Name an ore of Mercury and state the form in which Mercury is present in it. [1]
- (b) What happens to zinc carbonate when it is heated strongly in a limited supply of air ? [1]
- (c) The reaction of a metal A with Fe_2O_3 is highly exothermic and is used to join railway tracks. (I) Identify the metal A and name the reaction taking place. (II) Write the chemical equation for the reaction of metal A with Fe_2O_3 . [2]

Previously asked in: 2023 31/5/1 Q37

♦ Metals and Non-metals

Calcination of zinc carbonate (ZnCO_3)Ore of Mercury – Cinnabar (HgS)

Ores and their concentration / extraction of metals

Thermite reaction – Aluminium reacting with Fe_2O_3

Q67. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS

[3]

Answer the following :

- (a) What is a reactivity series of elements ? How is it developed ? Arrange the following elements as they are arranged in the reactivity series : Aluminum, Calcium, Copper, Lead [2]
- (b) Write balanced chemical equation to show the reaction of iron (III) oxide (Fe_2O_3) with aluminium. [1]

Previously asked in: 2025 31/3/1 Q27

♦ Metals and Non-metals

Reactivity Series of Metals

Thermite Reaction (Reaction of Fe_2O_3 with Aluminium)

Q68. § 3.2 CHEMICAL PROPERTIES OF METALS

[5]

Answer the following :

- (i) Consider the following metals : K, Ca, Al, Cu, Ag, Fe. Select from the above metals, a metal which I. does not react with oxygen even at high temperature. II. reacts with oxygen at ordinary temperature and forms a protective oxide layer which prevents the metal from further oxidation. III. catches fire when kept in the open. IV. does not burn in oxygen but the hot metal is coated with a black coloured oxide layer. [2]
- (ii) What are amphoteric oxides ? With the help of balanced chemical equations show that aluminium oxide is an amphoteric oxide. [2]
- (iii) What are alkalis ? Give one example. [1]

Previously asked in: 2025 31/3/1 Q34(a)

♦ Metals and Non-metals

Alkalis — definition and examples

Amphoteric oxides and reactions of aluminium oxide with acids and bases

Reactivity of metals with oxygen (activity series)

Q69.

[1]

Which of the following is an amphoteric oxide ?

- (A) Na_2O
- (B) K_2O
- (C) CO_2
- (D) Al_2O_3

Previously asked in: 2026 31/5/1 Q19

♦ Metals and Non-metals

Amphoteric oxides

Q70.

§ 3.2 CHEMICAL PROPERTIES OF METALS

§ 3.3 HOW DO METALS AND NON-METALS REACT?

§ 3.4 OCCURRENCE OF

METALS

State reasons for the following : Zinc oxide is an amphoteric oxide.

Previously asked in: 2024 31/3/1 Q27 (a)

♦ Metals and Non-metals

Amphoteric oxides of metals

Q71.

§ 3.1 PHYSICAL PROPERTIES

§ 3.2 CHEMICAL PROPERTIES OF METALS

[5]

Attempt option (A):

- (i) Give reasons for the following : (I) Ionic compound have generally high melting points and boiling points. (II) Solder, an alloy of lead and tin, is used for welding electrical wires. (III) Carbon cannot reduce the oxides of Na or Mg. [3]

- (ii) The reaction of compound 'X' with aluminium is used to join railway tracks : (I) Identify the compound 'X'. (II) Name the reaction. (III) Write the balanced chemical equation of the reaction of compound 'X' with aluminium. [2]

Previously asked in: 2026 31/5/1 Q29 ((A))

♦ Metals and Non-metals

Alloys – solder (lead-tin) used for welding electrical wires

Carbon cannot reduce oxides of highly reactive metals (Na, Mg)

Ionic compounds – high melting and boiling points

Thermite reaction – iron(III) oxide with aluminium to join railway tracks

Q72.

§ 3.2 CHEMICAL PROPERTIES OF METALS

§ 3.3 HOW DO METALS AND NON-METALS REACT?

§ 3.4 OCCURRENCE OF

METALS

[1]

Which one of the following metals does not react with cold water ?

- (A) Sodium
- (B) Potassium
- (C) Calcium
- (D) Magnesium

Previously asked in: 2026 31/4/1 Q21

♦ Metals and Non-metals

Reaction of Metals with Water

Q73.

§ Chapter Introduction

§ 3.1 PHYSICAL PROPERTIES

§ 3.4 OCCURRENCE OF METALS

[1]

Alloys are homogeneous mixture of metal with a metal or non-metal. Which among the following alloys contain non-metal as one of its constituents ?

- (A) Brass
- (B) Bronze
- (C) Amalgam
- (D) Steel

Previously asked in: 2026 31/4/1 Q22

♦ Metals and Non-metals

Alloys and their Constituents

Q74. § 3.2 CHEMICAL PROPERTIES OF METALS**[1]**

A metal 'X' is used in thermite process. When X is burnt in air it gives an amphoteric oxide 'Y'. 'X' and 'Y' are respectively :

- (a) Fe and Fe_2O_3
- (b) Al and Al_2O_3
- (c) Fe and Fe_3O_4
- (d) Al and Al_3O_4

Previously asked in: 2023 31/1/1 Q5

♦ Metals and Non-metals

Thermite process and amphoteric oxides of metals

Q75. § 3.2 CHEMICAL PROPERTIES OF METALS**[4]**

Three metal samples of magnesium, aluminium and iron were taken and rubbed with sand paper. These samples were then put separately in test tubes containing dilute hydrochloric acid. Thermometers were also suspended in each test tube so that their bulbs dipped in the acid. The rate of formation of bubbles was observed. The above activity was repeated with dilute nitric acid and the observations were recorded.

Answer the following questions :

- (a) When activity was done with dilute hydrochloric acid, then in which one of the test tubes was the rate of formation of bubbles the fastest and the thermometer showed the highest temperature ? [1]
- (b) Which metal did not react with dilute hydrochloric acid ? Give reason. [1]
- (c) Answer either (i) or (ii): [2]

Previously asked in: 2024 31/4/1 Q37

♦ Metals and Non-metals

Reactivity Series of Metals

Reactivity of metals with dilute acids

Q76. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.5 CORROSION**[2]**

One student was comparing the reactivity of different metals for his science project. He added iron filings in four test tubes A, B, C and D containing aqueous solutions of ZnSO_4 , CuSO_4 , FeSO_4 and $\text{Al}_2(\text{SO}_4)_3$.

Read the following passage and answer the questions that follow :

- (i) In which of the test tubes will he observe the reaction to be the most vigorous and why ? [1]
- (ii) Write a balanced equation for the reaction involved. [1]

Previously asked in: 2026 31/2/1 Q25

♦ Metals and Non-metals

Displacement Reactions of Metals

Reactivity Series of Metals

Q77. § 3.2 CHEMICAL PROPERTIES OF METALS**[3]**

With the help of suitable chemical equations, list the two main differences between roasting and calcination. How is metal reduced from the product obtained after roasting/calcination of the ore ? Write the chemical equation for the reaction involved.

Previously asked in: 2023 31/2/1 Q28

♦ Metals and Non-metals

Reduction of metal oxides to metals (thermite/carbon/CO reduction) after roasting/calcination

Roasting vs Calcination – differences with chemical equations

Q78. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.4 OCCURRENCE OF METALS**[1]**

The metals obtained from their molten chlorides by the process of electrolytic reduction are :

- (A) Gold and silver
- (B) Calcium and magnesium
- (C) Aluminium and silver
- (D) Sodium and iron

Previously asked in: 2025 31/1/1 Q6

♦ **Metals and Non-metals** Electrolytic Reduction of Molten Chlorides

Q79. § 3.1 PHYSICAL PROPERTIES § 3.2 CHEMICAL PROPERTIES OF METALS § 3.5 CORROSION**[2]**

A light green coloured solution of sulphate salt of metal 'P' is taken in a beaker, a rod of another metal 'Q' is put in this solution as shown the following figures :

Identify the metals 'P' and 'Q' and write its chemical equation for the reaction that occurs. State the conclusion of this reaction in terms of reactivity series of metals.

Previously asked in: 2025 31/6/1 Q21

♦ **Metals and Non-metals** Chemical Equation for Iron and Copper Sulphate Reaction
Displacement Reactions – colour change in copper sulphate solution with iron Indicators of Chemical Reactions – Change in Colour
Reactivity Series and Displacement Reactions of Metals

Q80. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.4 OCCURRENCE OF METALS**[1]**

Assertion (A) : The metals high up in the reactivity series cannot be obtained from their compounds by heating with carbon.

Reason (R) : Displacement reactions can also be used to obtain metal.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
- (C) Assertion (A) is true, but Reason (R) is false.
- (D) Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 31/2/1 Q17

♦ **Metals and Non-metals** Displacement reactions for obtaining metals Reactivity series and extraction of metals

Q81. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.5 CORROSION**[1]**

Assertion (A) : A piece of Zinc metal gets reddish brown coating when kept in copper sulphate solution for some time.

Reason (R) : Copper is more reactive metal than Zinc.

- 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 correct explanation of (A).
- C (A) is true, but (R) is false.
- D (A) is false, but (R) is true.

Previously asked in: 2024 31/3/1 Q17

♦ **Metals and Non-metals** Reactivity Series and Displacement Reactions

Q82. § 3.2 CHEMICAL PROPERTIES OF METALS § 3.3 HOW DO METALS AND NON-METALS REACT? § 3.5 CORROSION**[5]**

Attempt option (B):

- (i) Write the balanced chemical equations when : (I) A mixture of Cu_2O and Cu_2S is heated. (II) ZnS is heated in the presence of oxygen. [2]
- (ii) Give reasons for the following : (I) The wires carrying current in homes have a coating of PVC. (II) To make hot water tanks, copper is used and not steel. [2]
- (iii) Show the formation of ionic compound CaO with electron dot structure. [Atomic number : $\text{Ca} = 20$, $\text{O} = 8$] [1]

Previously asked in: 2026 31/5/1 Q29 ((B))

♦ Metals and Non-metals

Electrical conductivity and insulating properties – PVC coating on wires

Electron dot structure and formation of ionic compounds – CaO Extraction of metals – roasting and smelting reactions ($\text{Cu}_2\text{O} + \text{Cu}_2\text{S}$, $\text{ZnS} + \text{O}_2$)

Properties of metals – why copper is preferred over steel for hot water tanks

Q83. § 3.4 OCCURRENCE OF METALS**[2]**

How is zinc extracted from its ore? Name the processes involved in the extraction and write chemical equations for the reactions that occur during these processes.

Previously asked in: 2025 31/4/1 Q22(B)

♦ Metals and Non-metals

Extraction of Zinc from its Ore

Reduction of Metal Oxides with Carbon (Coke)

Roasting of Zinc Ore (ZnS to ZnO)**Q84.** § 3.5 CORROSION**[1]**

A student notices that her silver jewellery turned dull and had a grey-black coating over it after wearing for a few months. What results in the change in colour of the silver metal ?

- (A) The polish over the jewellery was removed after wearing for a few months.
- (B) The jewellery comes in contact with air, moisture and acids and corrodes.
- (C) Dust particles over the jewellery change its colour.
- (D) Its colour changes due to rusting.

Previously asked in: 2026 31/2/1 Q23

♦ Metals and Non-metals

Corrosion of metals (tarnishing of silver)

Tarnishing of Silver

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