SmartKalike

CBSE Class 10 · Science

Metals and Non-metals

10 most probable questions for Boards 2027

Q1. 1 mark · Multiple choice

Which statement correctly describes the behaviour of iron and copper when heated in air?
(a) An iron piece burns vigorously, while copper remains unchanged.
(b) Iron filings burn vigorously, while hot copper develops a black coating.
(c) Both iron and copper form white coatings.
(d) Neither iron nor copper reacts with oxygen.

Answer

(b) Iron filings burn vigorously, while hot copper develops a black coating — Iron filings burn vigorously when sprinkled in the flame of the burner, and the hot metal is coated with a black coloured layer of copper(II) oxide.

Q2. 2 marks · Short answer

What is the general product formed when a metal combines with oxygen? Write the word equation for this reaction.

Answer

Almost all metals combine with oxygen to form metal oxides. Metal + Oxygen → Metal oxide. For example, when copper is heated in air, it combines with oxygen to form copper(II) oxide, a black oxide.

Q3. 3 marks · Medium answer

What is metallic lustre? Define malleability and name the two metals identified as especially malleable.

Answer

1. Metallic lustre is the shining surface possessed by metals in their pure state. Rubbing a metal surface with sand paper makes the metal's appearance shiny.
2. Malleability is the property by which metals can be beaten into thin sheets. Malleability allows metals to be given different shapes according to our needs.
3. Gold and silver are the most malleable metals.

Q4. 4 marks · Long answer

Ionic compounds generally have high melting and boiling points. Explain why, referring to the forces between their ions and the energy needed to overcome them.

Answer

Ionic compounds have high melting and boiling points because strong attractions hold their oppositely charged ions together.

1. Ionic compounds contain positive and negative ions held by strong inter-ionic attraction. This

attraction acts between oppositely charged ions.

2. A considerable amount of energy is required to break the strong inter-ionic attraction. The ions cannot be separated until this energy is supplied.

3. At the melting point, sufficient energy overcomes the attractions holding the ions in the solid structure. The compound can then melt.

4. Similarly, a high temperature is needed to overcome the attractions sufficiently for the compound to boil. Therefore, both its melting point and boiling point are high.

The strong force of attraction between the ions accounts for the high temperatures needed for melting and boiling.

Q5. 5 marks · Long answer

Write balanced equations for the formation of copper(II) oxide and aluminium oxide from their elements. State the general nature of metal oxides, explain the amphoteric behaviour of aluminium oxide, and give the products formed when sodium oxide and potassium oxide react with water.

Answer

$2Cu(s) + O_2(g) \rightarrow$ (heat) $2CuO(s)$
$4Al(s) + 3O_2(g) \rightarrow$ (heat) $2Al_2O_3(s)$
$Al_2O_3(s) + 6HCl(aq) \rightarrow 2AlCl_3(aq) + 3H_2O(l)$
$Al_2O_3(s) + 2NaOH(aq) \rightarrow 2NaAlO_2(aq) + H_2O(l)$
$Na_2O(s) + H_2O(l) \rightarrow 2NaOH(aq)$
$K_2O(s) + H_2O(l) \rightarrow 2KOH(aq)$

The first two are combination reactions in which metals combine with oxygen to form metal oxides. Heating copper in air forms black copper(II) oxide, while aluminium forms aluminium oxide. Metal oxides are generally basic in nature. Aluminium oxide is amphoteric because it reacts with both acids and bases to produce salts and water. With hydrochloric acid, it forms aluminium chloride and water; with sodium hydroxide, it forms sodium aluminate and water. Most metal oxides are insoluble in water. Sodium oxide and potassium oxide dissolve in water to produce the alkalis sodium hydroxide and potassium hydroxide, respectively.

Q6. 1 mark · Multiple choice

Which is the correct decreasing order of reactivity with dilute hydrochloric acid for magnesium, aluminium, zinc and iron?

(a) Fe > Zn > Al > Mg
(b) Mg > Al > Zn > Fe
(c) Al > Mg > Fe > Zn
(d) Zn > Fe > Mg > Al

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/science/metals-and-non-metals

Q7. 2 marks · Short answer

What happens when silver and gold are heated in oxygen, even at high temperatures?

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/science/metals-and-non-metals

Q8. 3 marks · Medium answer

Define ductility and identify the most ductile metal mentioned in the textbook. What does the textbook state about the hardness of metals?

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Q9. 4 marks · Long answer

Define minerals and ores, distinguishing the two in terms of profitable metal extraction. Also state the major source of metals and name two soluble salts found in seawater.

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Q10. 5 marks · Long answer

Describe how metals react with oxygen, including the nature of aluminium oxide and zinc oxide. State four characteristic physical properties of metals, including the exception to their state at room temperature. Explain how metals form positive ions when reacting with non-metals. (5 marks)

Full answer on SmartKalike: https://smartkalike.com/cbse/class-10/science/metals-and-non-metals

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