



CHEMISTRY

BOOKS - VK GLOBAL PUBLICATION

CHEMISTRY (HINGLISH)

METALS AND NON-METALS

Ncert Intext Questions

1. Give an example of a metal which

(i) is a liquid at room temperature.

(ii) can be easily cut with a knife.

(iii) is the best conductor of heat.

(iv) is a poor conductor of heat



[Watch Video Solution](#)

2. Explain the meanings of malleable and ductile.



[Watch Video Solution](#)

3. Why is sodium kept immersed in kerosene oil?



[Watch Video Solution](#)

4. Write equations for the reactions of

(i) iron with steam

(ii) calcium and potassium with water



Watch Video Solution

5. Samples of four metals A , B ,C and D were taken and added to the following solution one by one.

The results obtained have been tabulated as follows:

| Metal | Iron(II) sulphate | Copper(II) sulphate | Zinc sulphate | Silver nitrate |
|-------|-------------------|---------------------|---------------|----------------|
| A | No reaction | Displacement | — | — |
| B | Displacement | — | No reaction | — |
| C | No reaction | No reaction | No reaction | Displacement |
| D | No reaction | No reaction | No reaction | No reaction |

Use the table above to answer the following

question about metals A,B ,C and D.

(i) Which is the most reactive metal?

(ii) What would you observe, if B is added to a solution of copper(II) sulphate?

(iii) Arrange the metals A,B,C and D in the order of decreasing reactivity.



[Watch Video Solution](#)

6. 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 .



[Watch Video Solution](#)

 [Watch Video Solution](#)

7. What would you observe when zinc is added to a solution of iron (II) sulphate?

Write the chemical reaction that takes place.

 [Watch Video Solution](#)

8. Write the electron dot structures of sodium, oxygen and magnesium.

 [Watch Video Solution](#)

9. Show the formation of Na_2O and MgO by the transfer of electrons.



[View Text Solution](#)

10. What are the ions present in these compounds?



[View Text Solution](#)

11. Why do ionic compounds have high melting points?



[Watch Video Solution](#)

12. Define the terms: (a) Mineral (b) Ore (c) gangue



[View Text Solution](#)

13. Name two metals which are found in nature in the free state.



[Watch Video Solution](#)

14. What chemical process is used for obtaining a metal from its oxide?





[Watch Video Solution](#)

15. Metallic oxides of zinc, magnesium and copper were heated with the following metals:

| Metal | Zinc | Magnesium | Copper |
|-----------------|------|-----------|--------|
| Zinc oxide | | | |
| Magnesium oxide | | | |
| Copper oxide | | | |



[Watch Video Solution](#)

16. Which metals do not corrode easily?



[Watch Video Solution](#)

17. What are alloys?



Watch Video Solution

Ncert Exercises

1. Which of the following pairs will give displacement reactions?

NaCl solution and copper metal

(b) $MgCl_2$ solution and aluminium metal

(c) $MgCl_2$ solution and aluminium metal

(d) $AgNO_3$ solution and copper metal



Watch Video Solution



[Watch Video Solution](#)

2. Which of the following methods is suitable for preventing an iron frying pan from rusting?

- A. Applying greases
- B. Applying a coating of zinc
- C. Applying paint
- D. All of the above

Answer:



[Watch Video Solution](#)

3. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be

(a)

(b)

(c)

(d)

A. calcium

B. carbon

C. silicon

D. iron

Answer:



Watch Video Solution

4. Food cans are coated with tin and not with zinc because

- A. Zinc is costlier than tin
- B. zinc has a higher melting point than tin
- C. zinc is more reactive than tin
- D. zinc is less reactive than tin

Answer:



[Watch Video Solution](#)

5. You are given a hammer, a battery, a bulb, wires and a switch.

(a) How could you use them to distinguish between samples of metals and non-metals?

(b) Assess the usefulness of these tests in distinguishing between metals and non – metals.



[Watch Video Solution](#)

6. What are amphoteric oxides? Give two examples of amphoteric oxides.



[Watch Video Solution](#)

7. Name two metals which will displace hydrogen from dilute acids, and two metals which will not.



[Watch Video Solution](#)

8. In the electrolytic refining of a metal M , what would you take as the anode, the cathode and the electrolyte?



[Watch Video Solution](#)

9. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in figure below.



(a) What will be the action of gas on

(i) dry litmus paper?

(ii) moist litmus paper?

(b) Write a balanced chemical equation for the reaction taking place.



[Watch Video Solution](#)

10. State two ways to prevent the rusting of iron.



[Watch Video Solution](#)

11. What type of oxides is formed when non-metals combine with oxygen?



[Watch Video Solution](#)

12. Give reasons

(a) Platinum, gold and silver are used to make jewellery.

(b) Sodium, potassium and lithium are stored under oil.

(c) Aluminium is a highly reactive metal, yet it is

used to make utensils for cooking.

(d) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.



[Watch Video Solution](#)

13. You must have seen tarnished copper vessels being cleaned with lemon or tamarind juice. Explain why these sour substances are effective in cleaning the vessels.



[Watch Video Solution](#)

14. Differentiate between metal and non-metal on the basis of their chemical properties.



Watch Video Solution

15. A man went door to door posing as a goldsmith. He promised to bring back the glitter of old and dull gold ornaments. An unsuspecting lady gave a set of gold bangles to him which he dipped in a particular solution. The bangles sparkled like new but their weight was reduced drastically. The lady was upset but after a futile argument the man beat

a hasty retreat. Can you play the detective to find out the nature of the solution he had used?



[Watch Video Solution](#)

16. Give reasons why copper is used to make hot water tanks and not steel (an alloy of iron).



[Watch Video Solution](#)

Very Short Answer Questions

1. Why are metals good conductors of electricity.



[Watch Video Solution](#)

2. Which property of graphite is utilised in making electrodes?



[Watch Video Solution](#)

3. Which of the following metals will melt at body temperature?

Gallium, Magnesium, Caesium, Aluminium



[Watch Video Solution](#)

4. Name two metals that do not react with water at all.



[Watch Video Solution](#)

5. What happens when calcium is treated with water?

(i) It does not react with water.

(ii) It reacts violently with water.

(iii) It reacts less violently with water.

(iv) Bubbles of hydrogen gas formed stick to the surface of calcium.



[Watch Video Solution](#)

6. Generally, non-metals are not lustrous. Which of the following non-metals is lustrous?



[Watch Video Solution](#)

7. What is the nature of non - metal oxide?



[Watch Video Solution](#)

8. What is the nature of metal oxides?



[Watch Video Solution](#)

9. Why do copper objects develop a green coating in air?

 [Watch Video Solution](#)

10. Why do silver articles become black after some time ?

 [Watch Video Solution](#)

11. Which oxide of iron could be obtained on prolonged reaction of iron with steam?



[Watch Video Solution](#)

12. Why are ionic compounds usually hard?



[Watch Video Solution](#)

13. Why does aluminium not react with water under ordinary conditions?



[Watch Video Solution](#)

14. In nature, metal A is found in a free state while metal B is found in the form of its compounds. Which of these two will be nearer to the top of the activity series of metals?



Watch Video Solution

15. Arrange the following metals in decreasing order of their reactivity.

Fe, Zn, Na, Cu, Ag



Watch Video Solution

16. Why cannot aluminium be obtained by reduction of its oxide with carbon?



[View Text Solution](#)

17. Why does a little addition of carbon in iron make it more useful?



[View Text Solution](#)

18. Give an example of a sulphide ore which is reduced to metal by heating along i.e., by roasting.



[Watch Video Solution](#)

19. Metals are refined by using different methods.

Which of the following metals are refined by electrolytic refining?



[Watch Video Solution](#)

20. What is rust ?



[Watch Video Solution](#)

21. What is corrosion?



[View Text Solution](#)

22. What is aqua regia? Write its reaction product with gold and platinum.



[Watch Video Solution](#)

23. Which metals are mixed with iron to get stainless steel?



[Watch Video Solution](#)

24. Why is stainless steel preferred for making household utensils?



Watch Video Solution

25. What is meant by galvanisation? Why is it done?



Watch Video Solution

26. Name an alloy of

(i) aluminium used in the construction of aircraft.

(ii) Lead used in joining metals for electrical work.



[Watch Video Solution](#)

Short Answer Question I

1. Explain why the surfaces of some metals become dull when exposed to air for sometime.



[Watch Video Solution](#)

2. Give two examples each of the metals that are good conductors and comparatively poor

conductors of heat respectively.



[Watch Video Solution](#)

3. Name one metal and one non-metal that exist in liquid state at room temperature. Also name two metals having melting point less than 310 K (37°C).



[Watch Video Solution](#)

4. A zinc plate was kept in a glass container having copper sulphate solution. On examining it was

found that the blue colour of the solution is getting fader and fader. After a few days when the zinc plate was taken out of the solution, a number of small holes were noticed in it. State the reason and give chemical equation of the reaction involved.



[Watch Video Solution](#)

5. Generally, when metals are treated with mineral acids, hydrogen gas is liberated but when metals (except Mn and Mg), are treated with HNO_3 , hydrogen is not liberated, why ?



[Watch Video Solution](#)

 [Watch Video Solution](#)

6. Give reasons for the following :

Metals replace hydrogen from dilute acids whereas non-metals do not.

 [Watch Video Solution](#)

7. What happens when

iron nail is placed in silver nitrate solution?

(ii) iron strip is dipped in zinc sulphate solution?

 [Watch Video Solution](#)

8. Why do metals not evolve hydrogen gas with nitric acid?



[Watch Video Solution](#)

9. Name a metal from each case:

It does not react with cold as well as hot water but reacts with steam.

(b) It does not react with any physical state of water.

(ii) When calcium metal is added to water the gas evolved does not catch fire but the same gas

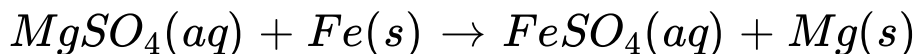
evolved on adding sodium metal to water catches fire. Why is it so?



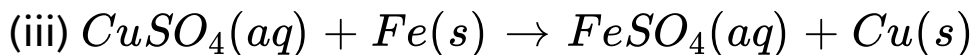
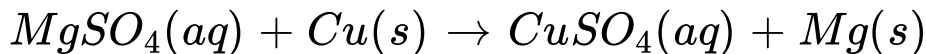
[View Text Solution](#)

10. Which of the following reactions will not occur?

Give reasons.



(ii)



[Watch Video Solution](#)

11. List any two observations when a highly reactive metal is dropped in water.



[Watch Video Solution](#)

12. State the reason for the following behaviour of zinc metal:

On placing a piece of zinc metal in a solution of mercuric chloride, it acquires a shining silvery surface but when it is placed in a solution of magnesium sulphate no change is observed.



[Watch Video Solution](#)

13. An ore gives carbon dioxide on treatment with a dilute acid. What steps will you take to convert such a concentrated ore into free metal?



[Watch Video Solution](#)

14. The following reaction takes place when aluminium powder is heated with MnO_2



(a) Is aluminium getting reduced ?

(b) Is MnO_2 getting oxidised ?



[Watch Video Solution](#)

15. What is a thermite reaction? Explain with the help of an equation. state one use of this reaction.



Watch Video Solution

16. Why should the metal sulphides and carbonates be converted to metal oxides in the process of extraction of metal from them?



Watch Video Solution

17. What is 24-carat gold? How will you convert it into 18-carat gold?



Watch Video Solution

18. What would happen to iron railings on the road side if they are not painted? Why does it happen so?



Watch Video Solution

19. Explain why, the galvanised iron article is protected against rusting even if the zinc layer is broken.

 [Watch Video Solution](#)

20. Why is aluminium oxide considered an amphoteric oxide?

 [Watch Video Solution](#)

21. Why are food cans tins plated instead of zinc plated through zinc is cheaper than tin?



[Watch Video Solution](#)

Short Answer Question Ii

1. Name two metals which react violently with cold water, Write any observation you would make when such a metal is dropped into water. How would you identify the gas evolved, if any, during the reactions?



[Watch Video Solution](#)



Watch Video Solution

2. Explain the following (a) Reactivity of At decreases if it is dipped in HNO_3 .

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

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

(d) Iron articles are galvanised.

(e) Metals like Na, K. Ca and Mg are never found in their free state in nature.



Watch Video Solution

3. Explain the following :

(i) Most metal oxides are insoluble in water but some of these dissolve in water, what are these oxides and their solutions in water called?

(ii) At ordinary temperature, the surface of metals such as magnesium, aluminium and zinc etc, is covered with a thin layer. What is the composition of this layer? State its importance.

(iii) Some alkali metals can be cut with a knife.



[View Text Solution](#)

4. When a metal X is treated with cold water, it gives a basic salt Y With molecular formula XOH (molecular mass = 40) and liberates a gas Z which easily catches fire. Identify X , Y and Z and also write the reaction involved.



[Watch Video Solution](#)

5. Of the three metals X , Y and Z here X reacts with cold water, Y with hot water and Z with steam only. Identify X , Y and Z and also arrange them in order of increasing reactivity.



[Watch Video Solution](#)

 [Watch Video Solution](#)

6. An element A burns with golden flame in air. It reacts with another element B, atomic number 17 to give a product C. An aqueous solution of product C on electrolysis gives a compound D and liberates hydrogen. Identify A, B, C and D. Also write down the equations for the reactions involved.



[Watch Video Solution](#)

7. Iqbal treated a lustrous, divalent element M with sodium hydroxide. He observed the formation ,of

bubbles in reaction mixture. He made the same observations when this element was treated with hydrochloric acid. Suggest how can he identify the produced gas. Write chemical equations for both the reactions.



[Watch Video Solution](#)

8. Give reasons

(a) Platinum, gold and silver are used to make jewellery.

(b) Sodium, potassium and lithium are stored under oil.

(c) Aluminium is a highly reactive metal, yet it is used to make utensils for cooking.

(d) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.



[Watch Video Solution](#)

9. Write one point of difference between electrolytic reduction and reduction with carbon. Give one example of each.



[Watch Video Solution](#)

10. What is meant by refining of metals? Describe the electrolytic refining of copper with a neat labelled diagram.



View Text Solution

11. An ore on heating in air produces sulphur dioxide. Which process would you suggest for its concentration? Describe briefly any two steps involved in the conversion of this concentrated ore into related metal.



Watch Video Solution

12. During extraction of metals, electrolytic refining is used to obtain pure metals. (a) Which material will be used as anode and cathode .for refining of silver metal by this process?(b) Suggest a suitable electrolyte also. (c) In this electrolytic cell, where do we get pure silver after passing electric current?



[Watch Video Solution](#)

13. A metal that exists as a liquid at room temperature is obtained by heating its sulphide in the presence of air. Identify the metal and its ore and give the reactions involved.



[Watch Video Solution](#)

14. How can a layer of aluminium oxide on an aluminium object be made thicker? What is the process called?



[Watch Video Solution](#)

15. A metal M is found in nature as MCO_3 . It is used in galvanising iron articles. Name the metal.



[Watch Video Solution](#)

16. How can the metal be obtained from its carbonate ore?



Watch Video Solution

17. Which two metal do not corrode easily? Give an example in each case to support that

(i) Corrosion of some metals is an advantage.

(ii) corrosion of some metals is a serious problem.



View Text Solution

18. In the formation of the compound AB, atoms of A lost one electron each while atoms of B gained one electron each. What is the nature of bond in AB? Predict the two properties of AB.



Watch Video Solution

19. Explain how the properties of an alloy are different from those of constituent metals.



Watch Video Solution

20. State reason for the following :

(i) Lemon is used for restoring the shine of tarnished copper vessels.

(ii) A metal sulphide is converted into its oxide to extract the metal from the sulphide ore.

(iii) Copper wire are used in electrical connections.



Watch Video Solution

Long Answer Questions

1. Give one example of 1315 compounds.



Watch Video Solution

 [Watch Video Solution](#)

2. 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 ?

 [Watch Video Solution](#)

3. Write the names and symbols of two most reactive metals. Explain by drawing electronic structure how any one of the two metals reacts with a halogen. State any four physical properties of the compound formed.



[Watch Video Solution](#)

4. Hydrogen is not a metal but is has been assigned a place in the reactivity. Series of metals. Explain.



[View Text Solution](#)

5. How would you show that silver is chemically less reactive than copper?



[Watch Video Solution](#)

6. What is an ionic bond?



[Watch Video Solution](#)

7. How is an ionic bond formed?



[Watch Video Solution](#)

8. Write the formation of magnesium chloride.



[Watch Video Solution](#)

9. Distinguish between ionic and covalent compounds under the following properties:

(a) Strength of forces between constituent elements

(ii) Solubility of compounds in water

(c) Electrical conduction in substances



[View Text Solution](#)

10. Explain how the following metals are obtained from their compound by the reduction process:

(a) Metal M which is in the middle of the reactivity series.

(b) Metal N which is high up in the reactivity series

Give one example of each type.



[View Text Solution](#)

11. Distinguish between roasting and calcination .

Which of these two is used for sulphide ores and why?



[View Text Solution](#)

12. Write a chemical equation to illustrate the use of aluminium for joining cracked railway lines.

 [Watch Video Solution](#)

13. Name the anode, the cathode and the electrolyte used in the electrolytic refining of impure copper.

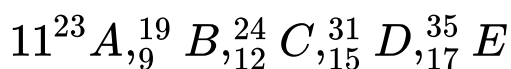
 [Watch Video Solution](#)

14. Write about different chemical processes used for obtaining a metal from its oxides, for metals low in the reactivity series, metals in the middle of the reactivity series and metals towards the top of the reactivity series.



[View Text Solution](#)

15. How do you classify elements into metals and non metals on the basis of their electronic configuration? Choose metal and non metal out of the following?

[Watch Video Solution](#)

16. What type of bond will be formed if?

- (a) A combines with B? (b) A combines with E (c) C combines with E (d) D combines with E



[View Text Solution](#)

Hots Higher Order Thinking Skills

1. There are 3 unknown metals-A ,B and C,C displaces B from its oxide while with oxide of A, there is no reaction. Give the reactivity order of A, B and C.



[Watch Video Solution](#)

2. A copper coin is kept immersed in a solution of silver nitrate for some time. What will happen to

the coin and the colour of the solution?



[Watch Video Solution](#)

3. An element A reacts with water to form a compound B which is used in white washing. The compound B on heating forms an oxide C which on treatment with water gives back B. Identify A, B and C and give the reactions involved.



[Watch Video Solution](#)

4. M is an element which is out of Cu,Fe,Al,Na. It shows the following properties:

(i) One of its ore is rich in M_2O_3 .

(ii) M_2O_3 is not affected by water.

(iii) It corrodes easily.

(iv) It forms two chlorides MCl_2 and MCl_3 .

Identify 'M'



[View Text Solution](#)

5. Carbon can reduce copper oxide to copper but not CaO to Ca. Why?



[Watch Video Solution](#)

 [Watch Video Solution](#)

6. A metal A, which is used in thermite process, when heated with oxygen gives an oxide B, which is amphoteric in nature. Identify A and B. Write down the reactions of oxide B with HCl and NaOH.



[Watch Video Solution](#)

Proficiency Exercise Very Short Answer

1. Why does calcium float in water?



[Watch Video Solution](#)

2. List two properties of gold and silver which make them most suitable for making ornaments according to our need.

 [Watch Video Solution](#)

3. By which method metals of high reactivity are purified?

 [Watch Video Solution](#)

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



[Watch Video Solution](#)

5. Name the process by which sulphide ores are concentrated.



[Watch Video Solution](#)

Proficiency Exercise Short Answer Question I

1. Give reason for the following :

(a) Sodium metal is kept immersed in kerosene.

(b) Blue colour of copper sulphate disappears when a some aluminium powder is added in it.



[Watch Video Solution](#)

2. The electronic configurations of three elements X, Y and Z are X 2, 8, Y-2, 8, 7 and Z- 2, 8, 2. Which of the following is correct?



[Watch Video Solution](#)

3. What are the constituents of solder alloy? Which property of solder makes it suitable for welding electrical wires?

 [Watch Video Solution](#)

4. The reaction of metal 'X' with Fe_2O_3 is highly exothermic and is used to join railway tracks. Identify the metal 'X'. Write the chemical equation for the reaction.

 [Watch Video Solution](#)

5. What will you observe when:

(a) Some zinc pieces are put into copper sulphate solution?

(b) Some silver pieces are put into green coloured ferrous sulphate solution?



[Watch Video Solution](#)

Proficiency Exercise Short Answer Question II

1. (a) An element X on reacting with oxygen forms an oxide X_2O . The oxide dissolves in water and turns blue litmus red. Predict whether the element

is metal or non metal.

(b) A solution of copper sulphate was kept in an iron pot. After few days the pot developed some holes in it. How will you account for this?



Watch Video Solution

2. Write the chemical equations for the reactions taking place when:

(a) Magnesium ribbon is burnt in presence of air.

(b) Sodium metal catches fire in contact with water.

(c) Steam is passed over hot aluminium.



Watch Video Solution

3. A non-metal A which is the largest constituent of air, when heated with H_2 in 1 : 3 ratio in the presence of catalyst (Fe) gives a gas B. On heating with O_2 it gives an oxide C. If this oxide is passed into water in the presence of air, it gives an acid D which acts as a strong oxidising agent.

(a) Identify A, B, C and D.

(b) To which group of the periodic table does this non-metal belongs?



Watch Video Solution

4. A Compound X conducts electricity and is soluble in water. What kind of Compound is X, ionic or covalent? Assign other two properties of compound X other than given in the question.



[Watch Video Solution](#)

5. An alkali metal A gives a compound B (molecular mass = 40) on reacting with water. The compound B gives a soluble compound C on treatment with aluminium oxide. Identify A, B and C and give the reactions involved.



[Watch Video Solution](#)

 Watch Video Solution

Proficiency Exercise Long Answer Question

1. (a) With the help of a labelled diagram, explain the process of electrolytic refining of copper.

(b) Name the substance formed on the surface of copper when it reacts slowly with moist CO_2 in the air.



Watch Video Solution

2. The electronic configuration of a magnesium atom is 2,8,2 and that of a chlorine atom is 2,8,7. State the type of bond formed between the two and the formula of a compound formed. Show its formation with the help of electron-dot structure. Also list its two properties.



[Watch Video Solution](#)

3. Given below are the steps for extraction of copper from its ore. Write the reaction involved.

(i) Roasting of copper (I) sulphide.

(ii) Reduction of copper (I) oxide with copper (I)

sulphide.

(iii) Electrolytic refining

(b) Draw a neat and well labelled diagram for electrolytic refining of copper.



Watch Video Solution