

- Q1.** What type of oxides are formed when non-metals combine with oxygen?
- Q2.** 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) Calcium (b) Carbon (c) Silicon (d) Iron
- Q3.** Name two metals which are found in nature in the free state.
- Q4.** What chemical process is used for obtaining a metal from its oxide?
- Q5.** Which metals do not corrode easily?
- Q6.** What are alloys?
- Q7.** Which of the following methods is suitable for preventing an iron frying pan from rusting?
(a) Applying grease (b) Applying paint
(c) Applying a coating of zinc (d) All of the above
- Q8.** 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.
- Q9.** Give an example of a metal which
(a) is a liquid at room temperature. (b) can be easily cut with a knife.
(c) is the best conductor of heat. (d) is a poor conductor of heat.
- Q10.** Which gas is produced when dilute hydrochloric acid is added to a reactive metal? Write the chemical reaction when iron reacts with dilute sulphuric acid H_2SO_4 .
- Q11.** Why is sodium kept immersed in kerosene oil?
- Q12.** Explain the meanings of malleable and ductile.
- Q13.** 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?
- Q14.** What would you observe when zinc is added to a solution of iron (II) sulphate? Write the chemical reaction that takes place.
- Q15.** Which of the following pairs will give displacement reactions?
(a) NaCl solution and copper metal. (b) $MgCl_2$ solution and aluminium metal.
(c) $FeSO_4$ solution and silver metal. (d) $AgNO_3$ solution and copper metal.
- Q16.** What are amphoteric oxides? Give two examples of amphoteric oxides.
- Q17.** Name two metals which will displace hydrogen from dilute acids, and two metals which will not.

Q18. Given reasons:

- (a) Platinum, Gold and Silver are used to make jewellery.
- (b) Sodium, Potassium and Lithium are stored under oil.

Q19. Why do ionic compounds have high melting points?

Q20. Give reasons why copper is used to make hot water tanks and not steel (an alloy of iron).

Q21. 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.

Q22. State two ways to prevent the rusting of iron.

Q23. In the electrolytic refining of a metal M, what would you take as the anode, the cathode and the electrolyte?

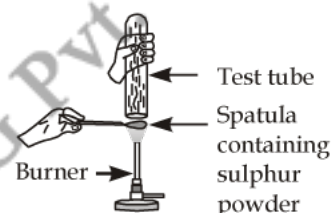
Q24. Given reasons:

- (a) Aluminium is a highly reactive metal, yet it is used to make utensils for cooking.
- (b) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.

Q25. Write equations for the reactions of (a) iron with steam (b) calcium and potassium with water.

Q26. 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 the 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.



Q27. 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:

Metals	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 given above to answer the following questions about metals A, B, C and D.

- (a) Which is the most reactive metal?
- (b) What would you observe if B is added to a solution of Copper (II) sulphate?
- (c) Arrange the metals A, B, C and D in the order of decreasing reactivity.

Q28. A man went door to door posing as a goldsmith. He promised to bring back the gliter 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?

Q29. Metallic oxides of zinc, magnesium and copper were heated with the followig metals:

Metal	Zinc	Magnesium	Copper
Zinc oxide			
Magnesium oxide			
Copper oxide			

In which cases will you find displacement reactions taking place?

Q30. Define the following terms: (a) Mineral (b) Ore and (c) Gangue.

Q31. (a) Write the electron-dot structures for sodium, oxygen and magnesium.

(b) Show the formation of Na_2O and MgO by the transfer of electrons.

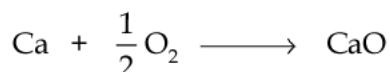
(c) What are the ions present in these compounds?

Q32. Differentiate between metal and non-metal on the basis of their chemical properties.

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S1. Acidic oxides are formed when non-metals combine with oxygen.

S2. (a) Calcium reacts with oxygen to give CaO which dissolves in water to give lime water.



S3. Gold and Platinum.

S4. A metal is obtained from its oxide by the process of reduction.

S5. Metals which are placed at the bottom of activity series like silver, gold, platinum do not corrode easily.

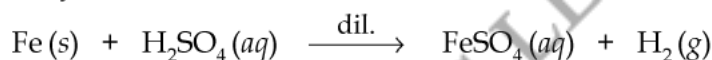
S6. An alloy is a homogeneous mixture of two or more metals or a metal and a non-metal. It is obtained by first melting the primary metal and then dissolving the other elements in it in definite proportion. It is then cooled at room temperature.

S7. (c) Applying a coating of zinc.

S8. (c) Food might react with zinc and get spoilt. Therefore food cans are coated with tin.

S9. (a) Mercury (b) Sodium (c) Silver (d) Lead

S10. Hydrogen gas is produced when dilute hydrochloric acid is added to a reactive metal.



S11. Sodium reacts so vigorously with oxygen that it catches fire when kept in the open. Hence, to protect accidental fires, it is kept immersed in kerosene oil. It cannot be immersed in water because there is a violent reaction.

S12. A substance that can be beaten into sheets is said to be malleable.

For example: Iron, Copper, etc.

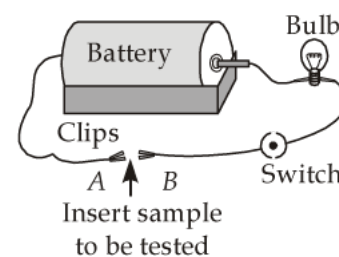
A substance that can be drawn into wires is called ductile.

For example: Gold, Silver, etc.

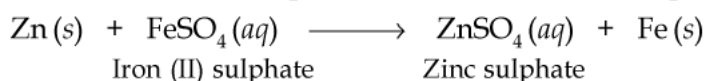
S13. (a) Place the sample on an iron block. Strike with hammer. If the sample takes the shape of a sheet, it is a metal. If it breaks into pieces, it is a non-metal.

Set up an arrangement by using a bulb, a battery wires and a switch (see figure). Insert the samples of metals and non-metals in the clips one by one and turn the switch on. If the bulb glows, the sample is a metal. If not, then the sample is a non-metal.

(b) The above two methods can, in general, be used to distinguish between metals and non-metals. But there are some exceptions. For example, graphite, which is a form of carbon, a non-metal, is a conductor of electricity.



S14. As zinc is more reactive than iron, displacement reaction will take place.



S15. This is decided on the basis of activity series of metal. A metal higher on the activity series can displace a metal lower on the activity series from its salt solution. Thus,

- (a) No displacement. (b) No displacement.
(c) No displacement. (d) Displacement reaction takes place.

S16. Metal oxides which show both acidic as well as basic behaviour are called amphoteric oxides. Such metal oxides react both with acids and bases.

Examples: Aluminium oxide (Al_2O_3)
Zinc oxide (ZnO)

S17. Magnesium and zinc metals displace hydrogen from dilute acids.

Copper and silver do not displace hydrogen from dilute acids.

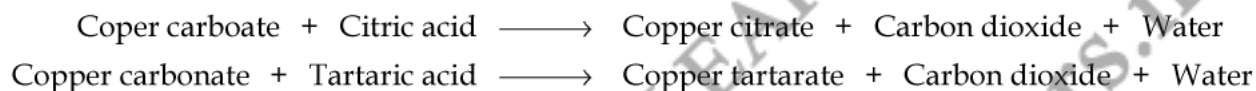
S18. (a) These metals are unreactive. They do not react with oxygen and other gases present in air and with moisture. Thus, their shine is maintained. That is why these metals are used to make jewellery.

(b) Reaction of sodium, potassium and lithium with oxygen is so violent that they catch fire. Also we cannot store them under water because there is a brisk reaction. Hence, they are stored under oil.

S19. There are strong forces of attraction between oppositely charged ions in ionic compounds. Considerable amount of energy is required to break strong inter-ionic attraction. Therefore, they have high melting points.

S20. Electrical conductivity of a metal is decreased when it is alloyed with another metal or non-metal. Thus, the electrical conductivity of steel (which is an alloy) is much less than that of pure copper, that is why copper is used to make hot water tanks and not steel.

S21. Copper, on keeping in air, reacts with atmospheric carbon dioxide to form a green layer of copper carbonate. Copper carbonate reacts with citric acid present in lemon or tartaric acid present in tamarind to form soluble copper citrate or copper tartarate. The vessels are thus cleaned using water.



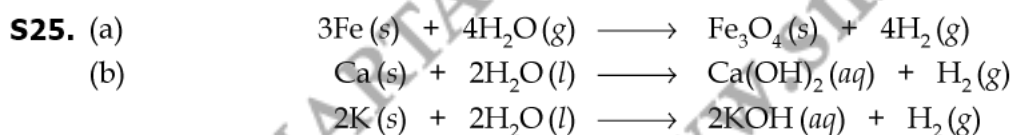
S22. Rusting of iron can be prevented by

- (a) by applying grease or paint. (b) by galvanising.

S23. Impure metal M is made the anode, a thin strip of pure metal M as the cathode and a solution of salt of metal M as the electrolyte.

S24. (a) This is because aluminium is a good conductor of heat. Aluminium forms a layer of aluminium oxide at high temperature after which it resists corrosion and does not react with food.

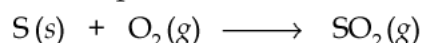
(b) It is easier to reduce oxide than the carbonates and sulphides to the metal.



S26. (a) Sulphur is a non-metal. Oxides of non-metals are acidic. In this case sulphur dioxide is produced which is acidic.

- (i) There will be no action of the gas on dry litmus paper.
(ii) Wet litmus paper will turn red.

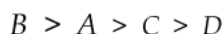
(b) The balanced chemical equation can be written as under:



- S27.** (a) Out of iron, copper, zinc and silver, zinc is at the top of activity series. Then comes iron. *B* gives displacement reaction with iron (II) sulphate, therefore, *B* is most reactive metal.
- (b) If *B* is added to a solution of copper (II) sulphate, displacement reaction will take place. Blue colour of copper sulphate will fade and red-brown particles of copper will settle down



- (c) The decreasing order of reactivity is:



- S28.** *Aqua regia* which is a mixture of 3 parts of concentrated hydrochloric acid and 1 part of concentrated nitric acid dissolves gold. The man put the gold bangles in this solution. The outer dirty layer of gold bangles dissolved in *aqua regia* bringing out the shining bangles.

As the outer layer of bangles dissolved in *aqua regia*, the weight was reduced drastically.

- S29.** Based on the activity series of the metals, the displacement reactions will take place as shown below:

Metal	Zinc	Magnesium	Copper
Zinc oxide	No reaction	Displacement	No reaction
Magnesium oxide	No reaction	No reaction	No reaction
Copper oxide	Displacement	Displacement	No reaction

- S30.** (a) **Mineral:** The elements or compounds which occur naturally in the Earth's crust are known as *minerals*.

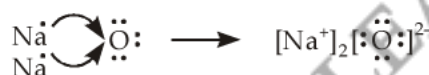
(b) **Ore:** Minerals from which metal can be extracted profitably are called *ores*.

(c) **Gangue:** Impurities such as soil and sand which are present in the minerals are called *gangue*.

- S31.** (a) Electron-dot structures for sodium, oxygen and magnesium are:



- (b) **Formation of Na₂O:**



Formation of MgO:



- (c) Ions present in Na₂O are Na⁺ and O²⁻

Ions present MgO are Mg²⁺ and O²⁻.

- S32.** Metals and non-metals can be differentiated on the basis of following chemical properties:

Metals	Non-Metals
1. Metals displace hydrogen from water.	1. Non-metals do not displace hydrogen from water.
2. Metals form basic oxides.	2. Non-metals form acidic oxides.
3. Metals displace hydrogen from dilute acids.	3. Non-metals do not displace hydrogen from dilute acids.
4. Metals form ionic chlorides with chlorine. The ionic chlorides are non-volatile.	4. Non-metals form covalent chlorides with chlorine. These chlorides are generally volatile.