Physical Properties of Metals and Non-metals

1. **Name a non-metal which is lustrous and a metal which is liquid at room temperature**
2. **A non-metal is an important constituent of food and firms to oxide B and C. Oxide of B is toxic Whereas C cause global warming . Identify A,B and C**

3. **Write one example of each the following:**
   a) **A metal and nonmetal which are liquid at room temperature**
   b) **A metal which is very soft and a non metal which is very hard**
   c) **A metal which has very low melting point and non metal which has very high melting point**
   d) **The wire carrying current in homes have a coating of pvc**
   e) **Metal that exist in liquid state at room temperature**
   f) **Most ductile and malleable metal**
   g) **Nonmetal that can exist in different forms**
   h) **Metal that is best conductor of electricity**
   i) **Metal that can melt at Palm**

Chemical Properties of Metals

1. **Give reasons for following:**
   a) **Zinc oxide is considered an amphoteric oxide**
   b) **Nonmetal in journal do not displace hydrogen from dilute acid**
   c) **Hydrogen is not evolved when a metal reacts with nitric acid except Mn and Mg**
   d) **Copper to make hot water tank.**

2. **Compare in tabular form the reactive of the following metal with cold and hot water**
   Sodium calcium magnesium

3. **When calcium metal is added to water, The gas evolved does not catch fire but the same gas evolved on adding potassium metal to water catches fire . Explain why**

4. **You are given samples of three metals- sodium, magnesium and copper. Suggest any two activities to arrange them in order of their decreasing reactivity.**

5. **Name a metal for each case**
   a) **It displays hydrogen gas from night Nitric acid**
   b) **It does not react with any physical state of water**
   c) **It does not react with cold as well as hot water but react with steam**

6. **Write balance Chemical equation to explain what happens when**
   a) **Mercury oxide is heated**
   b) **Mixture of Cuprous Oxide and cupress sulphide is heated**
   c) **Aluminium is reacted with manganese oxide**
   d) **Ferric oxide is reduced with aluminium**
   e) **Zinc carbonate undergoes calcination**

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7. **A reddish brown metal used in electrical wires when powdered and heated strongly turns black. When hydrogen gas is passed over this black substance, it regains its original colour. Based on this information answer the following questions:**
   (a) Name the metal and the black substance formed.
   (b) Write balanced chemical equations for the two reactions involved in the above information.

8. **Write balanced equations for the reaction of:**
   (i) Aluminium when heated in air. Write the name of the product.
   (ii) Iron with steam. Name the product obtained.
   (iii) Calcium with water. Why does calcium start floating in water?

9. **A thin zinc plate was kept in a glass container having $CuSO_4$, solution. On examining it was found that the blue colour of the solution is getting lighter and lighter. 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 write chemical equation of the reaction.**
   When a strip of zinc metal is put in copper sulphate solution, the blue colour of copper sulphate fades gradually. Why

10. **A metal 'M' on reacting with dilute acid liberates a gas 'G'. The same metal also liberates gas 'G' when it 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

11. **A student added few pieces of aluminium metal to two test tubes A and B containing aqueous solutions of iron sulphate and copper sulphate. In the second part of her experiment, she added iron metal to other test tubes C and D containing aqueous solutions of aluminium sulphate and copper sulphate.**
    In which test tube or test tubes will she observe colour change? On the basis of this experiment, state which one is the most reactive metal and why?

12. **Write balanced chemical equations to explain what happens, when**
    (i) Mercuric oxide is heated.
    (ii) Mixture of cuprous oxide and cuprous sulphide is heated.
    (iii) Aluminium is reacted with manganese dioxide.
    (iv) Ferric oxide is reduced with aluminium.
    (v) Zinc carbonate undergoes calcination.

13. **A metal 'M' is stored under kerosene. It vigorously catches fire if a small piece of this metal is kept open in air. Dissolution of this metal in water releases great amount of energy and the metal catches fire. The solution so formed turns red litmus blue.**

(a) Name the metal 'M'.
(b) Write formula of the compound formed when this metal is exposed to air.
(c) Why is metal 'M'stored under kerosene?
(d) If oxide of this metal is treated with hydrochloric acid, what would be the products?

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(e) Write balanced equations for:
(i) Reaction of 'M' with air.
(ii) Reaction of 'M' with water.
(iii) Reaction of metal oxide with hydrochloric acid

Properties of Ionic Compounds

1. **Show the formation of sodium oxide by transfer of electron between the combining atom**
2. **Why are ionic compound are usually hard?**
3. **Why do Metals conduct electricity**

4. **Metal X combines with non metal Y by the transferring of electron to form Z compound**
   a) **State the type of the born in compound Z**
   b) **State can you say about the melting and boiling point of compound Z**
   c) **Will this compound dissolve in kerosene or petrol**

5. **Describe how sodium and chlorine formed sodium chloride name the type of bonds shown in the structure.**

6. **Explain any two physical property of ionic compounds giving reason.**

7. **Write down important characteristics of ionic compound.**

8. **Explain the formation of ionic compound calcium oxide with electron dot structure**

9. **An element X displaces iron from the solution of iron sulphate. List your observation if the element X is treated with aqueous solution of copper sulphate, zinc sulphate and silver nitrate. Based on the observation arrange X ,Zn , Cu and Ag in Increasing order of their reactivity**

10. **In the information of compound between two atoms A and B, A loses to electron and B gain one electron.**
    A. **Suggest the formula of compound form between A and B**
    B. **On similar line explain the information of magnesium chloride$MgCl_2$ Molecule**
    C. **Common salt conducts electricity only in their molten state. Why?**
    D. **Why is metal melting point of NaCl high.**

11. **In the information of compound XY_2, Atom X donates one electron to each Y atom. show the electron dot structure of X and Y and the information of XY_2. what is the nature of bond in XY_2? Flight any three property of compoundXY2. The electronic configuration of Element X and Y are as follow X- 2,8,2 Y-2,7**

12. **Give reason for the following**
    a) **Ionic compound have generally high melting point**
    b) **Hydrogen is not a metal but it has been assigned a place in a reactivity series of metal.**

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Occurrence and Extraction of Metals, Corrosion

1. **What is concentration of ore? Why is it necessary to concentrate an over before processing?**

2. **Define the following terms mineral ,ore, gangue**

3. **Differentiate between with mineral And ore suitable example**

4. **List any two metals found in free state in Earth's crust ,where are they located in activity series**

5. **Write the steps involved in the extraction of pure metal in the middle of the activity series from their carbonate ore**

6. **How is copper extracted from sulphide ore? Explain the various steps supported by chemical equation. Draw label diagram for the electrolytic refining of copper.**

7. **A metal sulphide is converted into it oxide to extract the metal from the sulphide ore. State Reason**

8. **Write about the extraction of mercury metal from its cinnabar**

9. **With reference to the electrorefining of Impure copper answered the following**
   a) **What is the electrolyte use**
   b) **Name the cathode and anode used**
10. **Explain how the following matter are obtained from their compound by reducing process**
    a) **Metal X which is low in reactivity series**
    b) **Metal Y which is in middle of series**
11. **During extraction of metal, Electrolytic refining is used to obtain pure metal.**
    a) **Which material will be used as a node and cathode for refining of silver metal by this process?**
    b) **Suggest a suitable electrolyte Also**
    c) **In the electrolytic cell where do we get pure silver after passing electric current**
12. **In column I are given different method of extraction. The method used for extraction of metal given in column II**

Column one	Column Second
1. Reduction with carbon 2. Electrolytic reduction 3. Reduction with aluminium	Al, Zn, Na, Fe,Mn,Pb

13. **Differentiate between calcination and Roasting process giving one example of each**

14. **Metals towards the top of activity series can not be obtained from their compound by reducing with carbon , Why ?**

15. **The reaction of iron oxide with heated aluminium is used to join crack machine part. Reason**

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16. A metal M is found in nature as it carbonate. It is used in the galvanization of iron. Identify M and name its ore. How will you convert this or into free metal

17. The metal extracted from there or are not very pure. They contain impurities which can be removed by the process of refining. Name the most widely used process of refining impure metal. draw a diagram of apparatus used for refining of metal and state

a) The name of the rods which are used as cathode and anode
b) The electrolyte used during this process?
c) What happens to the pure metal when current passes through the electrolyte?
d) What happens to the soluble and insoluble impurity present in impure copper?

18. What is thermit process? Where is this process used? Write balance chemical equation for this reaction involved
b. Where does the metal aluminium ,used in this process ,occur in the reactivity series of metal?
c. Name the substance that are getting of oxidized and reduced in this process

19. Write the steps involved in the extraction of pure metal in the middle of the activity series from their carbonate ore.

20. Carbon can not reduce the oxidies of sodium,magnesium and aluminium to their respective metal why? Where are these metals placed in the reactivity series?

21. What is reactivity series? How does the reactivity series help in predicting the relative activity of various metal?

22. 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.

23. What is cinnabar? How is metal extracted from cinnabar? Explain briefly.

24. Suggest a method of reduction for the following metals during their metallurgical processes:
(*a*) metal 'A' which is one of the last second or third position in the reactivity.
(*b*) metal 'B' which gives vigorous reaction even with water and air.
(*c*) metal 'C' which is kept in the middle of activity series.

25. Which of the following is incorrect description of the process: [CBSE 2023]
(*a*) The impure metal from anode dissolves in electrolyte.
(*b*) The pure metal from the electrolyte deposits at cathode.
(*c*) Insoluble impurities settle at the bottom of anode.
(*d*) On passing electric current through the electrolyte, the pure metal from anode dissolves into electrolyte.

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Corrosion, Alloys

1. **List in a tabular form, The change in colour observed and the name of compound formed when silver copper and iron are to be corroded**

2. **What are alloy. lists to property of alloys.**
3. **What are two condition for rusting of iron state two ways for preventing rusting from Iron Article**
4. **Give reasons**
   a) **Silver metal does not easily combine with oxygen but silver jewellery tarnished after some time.**
   b) **Iron grills are frequently painted.**
   c) **Gold ornaments retain their lustre even after several years of use.**
   d) **Iron, the most widely used metal is never used in its pure state**
   e) **Lemon is used for restoring shine of tarnished copper vessel**

5. **Mention the name of metal for the following:**
   a) **Two metals which are alloyed with iron to make stainless steel**
   b) **Two metals which are used for making jewellery**
   c) **Metal present in bronze**

6. **Write the names and the symbol of consequent present in the following alloy**
   A. Brass B. Bronze C. Solder

7. **List three differentiating feature between the process of galvanisation and alloying**

8. **Define corrosion. List 2 damages caused by corrosion and suggest how corrosion can be prevented**

9. **How will you recognize the corrosion of silver?**

10. **An alloy has low melting point and is therefore used for electrical fuse name the alloy and write its constituent.**

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