

# CBSE Class 10 Science Important Questions for Chapter 3 Metals and Non-Metals

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## Class 10 Science Metals and Non Metals MCQs (1 Marks)

**1. Which of the following is a liquid non-metal at room temperature:**

- a) Mercury
- b) Bromine
- c) Chlorine
- d) Sulphur

**2. Which of the following is not an ionic compound.**

- a) KCl
- b)  $MgCl_2$
- c)  $CCl_4$
- d) NaCl

**3. Aqua regia is called as royal water because it dissolves gold its composition is 1:3 concentrated.**

- a)  $H_2SO_4$ :  $HNO_3$
- b)  $HNO_3$ :  $H_2SO_4$
- c)  $HNO_3$ : HCl
- d) HCl:  $HNO_3$

**4. Which one of the following four metals would be displaced from the solution of its salt by other three metals?**

- a) Mg
- b) Ag
- c) Zn
- d) Cu

**5. Alloys are homogenous mixtures of a metal with a metal or non-metal. Which of the following alloys contain non-metal as one of its constituents.**

- a) Brass
- b) Bronze
- c) Amalgam
- d) Stainless Steel.

**Answers** 1. (b) 2. (c) 3.(c) 4. (b) 5. (d)

### **Assertion Questions Type Questions**

**The following questions consists of two statements-Assertion**

**(A) and Reason (R). Answer these questions selecting the appropriate option given below:**

- a) Both A and R are true and R is the correct explanation for A.**
- b) Both A and R are true and R is not the correct explanation for A.**
- c) A is true but R is false.**
- d) A is false but R is true.**

**1. Assertion: Nitrogen is a non-metal.**

**Reason: Nitrogen has 5 valance electrons.**

**Ans:** (b) Both A and R are true and R is not the correct explanation for A.

**2. Assertion: Zinc oxide is amphoteric in nature.**

**Reason: Zinc oxide reacts with both acids and bases.**

**Ans:** (a) Both A and R are true and R is the correct explanation for A.

### **Metals and Non Metals Important Question of 1 Marks Very Short Answer Questions**

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**1. Why does a metal not release H<sub>2</sub> gas on reacting with dilute nitric acid?**

**Answer** – As nitric acid acts as a strong oxidising agent and oxidises the released H<sub>2</sub> gas to H<sub>2</sub>O and itself is reduced to either of these gases – N<sub>2</sub>O, NO<sub>2</sub> or NO.

**2. Why is copper used to make hot water tanks whereas steel is not?**

**Answer** – Copper is a better conductor of heat as compared to steel. Therefore, hot water tanks are made of copper.

### **3. Why do the non-metals not displace hydrogen from dilute acids?**

**Answer** – Non-metals being acceptor of electrons, cannot give electrons to the hydrogen ions of acid to reduce them to hydrogen gas. Hence non-metals do not displace hydrogen from dilute acids.

### **4. Give an example of a metal which**

**(i) can be easily cut with a knife.**

**(ii) is a liquid at room temperature.**

**Answer**

(i) Sodium

(ii) Mercury

## **Metals and Non Metals Important Question of 2 Marks Short Answer Type Questions**

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### **1. Name the following:**

**a) A metal which is preserved in kerosene**

**b) A lustrous coloured non metal**

**c) A metal which can melt while kept on palm,**

**d) A metal, which is a poor conductor of heat.**

**Answer**

a) Sodium

b) Iodine

c) Gallium and Caesium

d) Lead and mercury

### **2. Define Amphoteric oxides? Give two examples of such oxides.**

**Answer** – Some metal oxides show both acidic as well as basic behaviour. Those metal oxides which react with both acids as well as bases to produce salts and water are known as amphoteric oxides.

**For Example:** Aluminium oxide, Zinc oxide

### **3. Give reason for the following:**

**a) Sodium metal is kept immersed in kerosene.**

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

**Answer**

a) Sodium metal is so reactive that it reacts vigorously with the oxygen (of air). It catches fire and starts burning when kept open in the air. Sodium metal is so reactive that it reacts vigorously with the oxygen (of air). It catches fire and starts burning when kept open in the air.

b) When aluminium powder is put in copper sulphate solution, then the blue colour of copper sulphate solution

Since Al is more reactive than Cu, it displaces Cu from  $\text{CuSO}_4$  solution and forms colourless  $\text{Al}_2(\text{SO}_4)_3$

4. A thin zinc plate was kept in a glass container having  $\text{CuSO}_4$  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 the chemical equation of the reaction.

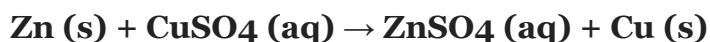
**Answer**

A strip of zinc metal is put in copper sulphate solution.

The blue colour of copper sulphate solution fades gradually due to the formation of colourless zinc sulphate solution. Since zinc is more reactive than copper, zinc displaces copper from copper sulphate solution.

Zinc metal is consumed and hence a number of small holes were formed in the zinc strip.

**5. Reverse of the following chemical reaction is not possible:**



**Justify this statement with reason.**

**Answer** –  $\text{ZnSO}_4 \text{ (aq)} + \text{Cu (s)} \rightarrow \times$  (no reaction)

Because Cu is less reactive than Zn in the activity series. Therefore, less reactive metal (Cu) does not displace more reactive metal (Zn) from its salt solution. Thus, this reaction is not possible.

**6. List four important properties of aluminium which are responsible for its great demand in industry.**

**Answer** – Important properties of aluminium:

It is a light metal.

It does not corrode as it forms a protective layer of oxide which prevents it from further oxidation.

It is a good conductor of heat and electricity.

It is used as a reducing agent in the extraction of metals from the oxide.

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

**Answer** – 'M' = Zinc metal

Zinc occurs as Zinc Carbonate in calamine ore,  $\text{ZnCO}_3$ .

Zinc can be extracted from the ore by:

(i) Zinc Carbonate is first converted into Zinc Oxide by calcinations. When calamine ore (zinc carbonate) is heated strongly in the absence of air, it decomposes to form zinc oxide and carbon dioxide.

(ii) Zinc metal is then extracted from zinc oxide by reduction with carbon (coke).

### **8. Write down important properties of ionic compounds.**

**Answer** – Ionic compounds are generally hard and solids.

Ionic compounds have high melting and boiling points.

Ionic compounds are mostly soluble in water and insoluble in solvents like kerosene oil, alcohols, etc.

In their molten state or aqueous solution, these are good conductors of electric current.

### **Metals and Non Metals Important Question of 5 Marks Very Long Answer Type Questions**

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**Draw a flow diagram to show the extraction of metals of medium reactivity from their sulphide ore.**

**Flow diagram to show extraction of metals of medium reactivity from their sulphide ores:**

#### **(b) Difference between Roasting and Calcination.**

**Answer** – Calcination:

It is done in case of carbonate ores.

The carbonate ore is heated in the absence of air to convert it into oxide.

The gas given out is  $\text{CO}_2$  (Carbon dioxide) gas.

Example:

Roasting:

It is done in case of sulphide ores.

In this, the ore is heated in the presence of air to convert it into oxide compound.

The gas given out is  $\text{SO}_2$  (sulphur dioxide) gas.

Example:

a) Show the formation of magnesium chloride and sodium chloride by transfer of electrons.

b) Identify the ions present in these compounds.

c) Why do ionic compounds not conduct electricity in the solid-state?

**Answer**

a) (i) Sodium (Na) & Magnesium (Mg) have 1 & 2 electrons respectively in the outermost shells of their atoms, so they lose their electrons to achieve the inert gas electron

configuration of eight valence electrons and form positively charged ions or cations.

On the other hand, Cl has seven electrons in its atom so it gains one electron to acquire inert gas configuration and forms negatively charged ion or an anion.

b.

c. Ionic compounds in the solid state do not conduct electricity because movement of ions in the solid state is not possible due to their rigid structure.

The metals extracted from their ores 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 metals. Draw a diagram of the apparatus used for refining of copper metal and state:

(i) The name of the rods which are used as cathode & anode.

(i) The electrolyte used during the process.

(iii) What happens to the pure metal when current passes through the electrolyte?

(iv) What happens to the soluble and insoluble impurities present in the impure copper?

**Answer** – The most common method for refining of impure metals is electrolytic refining.

Electrolytic Refining of Copper:

(i) A thin strip of pure metal is made the cathode whereas impure metal is made the anode.

(ii) Aqueous solution of salt of the metal to be refined.

(iii) An equivalent amount of pure copper metal from the electrolyte gets deposited on the cathode. Pure copper metal is collected at the cathode.

(iv) The soluble impurities go into the solution while the insoluble impurities settle down at the bottom of the anode and are known as anode mud.

You are given samples of three metals sodium, magnesium and copper.

Suggest any two activities to arrange them in order of their decreasing reactivity.

**Answer** – Given three Metals – Sodium (Na), Magnesium (Mg), Copper (Cu) Activity I.

When the three given metals Na, Mg and Cu are added to magnesium chloride solution separately taken in three different test tubes, we will find that displacement reactions will take place in the following manner:

This shows that Na is the most reactive metal as it displaces Mg from  $MgCl_2$  solution.

Activity II. When Na, Mg and Cu metals are taken in three different test tubes and  $CuSO_4$  solution is added in each test tube, we will find that displacement reactions will take place in the following manner:

This shows that Cu is the least reactive metal.  
Order of decreasing reactivity: Na > Mg > Cu.