

Metals and Non-Metals

1 Mark:

1. Metals generally occur in solid state. Name and write symbol of a metal that exists in liquid state at room temperature. [CBSE Sample Paper 2008]
2. Alloys are used in electrical heating devices rather than pure metals. Give one reason. [CBSE Sample Paper 2008]

3 Marks:

1. No chemical reaction takes place when granules of a solid, *A*, are mixed with the powder of another solid, *B*. However when the mixture is heated, a reaction takes place between its components. One of the products, *C*, is a metal and settles down in the molten state while the other product, *D*, floats over it. It was observed that the reaction is highly exothermic.
 - I. Based on the given information make an assumption about *A* and *B* and write a chemical equation for the chemical reaction indicating the conditions of reaction, physical state of reactants and products and the thermal status of reaction.
 - II. Mention any two types of reactions under which above chemical reaction can be classified. [CBSE, 2008]

5 Marks:

1. Explain how the following metals are obtained from their compounds by the reduction process :
 - I. Metal *M* which is in the middle of the reactivity series.
 - II. Metal *N* which is high up in the reactivity series.
Give one example of each type. [CBSE, 2009]
2. What is meant by refining of a metals? Name the most widely used method of refining impure metals produced by various reduction processes. Describe with the help of a labelled diagram how this method may be used for refining of copper. [CBSE, 2010]
3. Four metals A, B, C and D are, in turn, added to the following solutions one by one. The observations made are tabulated below: [CBSE sample paper 2008]

Metal	Iron (I) Sulphate	Copper (I) 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

Answer the following questions based on above information.

- I. Which is the most active metal and why?
- II. What would be observed if B is added to a solution of copper (II) sulphate and why?
- III. Arrange the metals A, B, C and D in order of increasing reactivity.
- IV. Container of which metal can be used to store both zinc sulphate solution and silver nitrate solution.
- V. Which of the above solutions can be easily stored in a container made up of any of these metals?

OR

You are given the following materials:

- I. Iron nails
- II. Copper sulphate solution
- III. Barium chloride solution
- IV. Copper powder
- V. Ferrous sulphate crystals
- VI. Quick Lime

Identify the type of chemical reaction taking place when.

- a) Barium chloride solution is mixed with copper sulphate solution and a white precipitate is observed.
 - b) On heating copper powder in air in a China dish, the surface of copper powder turns black.
 - c) On heating green coloured ferrous sulphate crystals, reddish brown solid is left and smell of a gas having odour of burning sulphur is experienced.
 - d) Iron nails when left dipped in blue copper sulphate solution become brownish in colour and the blue colour of copper sulphate fades away.
 - e) Quick lime reacts vigorously with water releasing a large amount of heat.
4. a) What is reactivity series? How does the reactivity series of metals help in predicting the relative activities of various metals?
- b) Suggest different chemical processes used for obtaining a metal from its oxides for metals in the middle of the reactivity series and metals towards the top of the reactivity series. Support your answer with one example each.

[CBSE Sample Paper 2017]
