

01

- (a) (i) Place the following metals in order, with the least reactive first, in the reactivity series.

Mg	Cu	Fe	Ca	Na
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- (ii) How does the effect of heat on their carbonate of a metal change with the position of the metal in the reactivity series ?
- (iii) Which of the given metals has the least tendency to form ions ?
- (b) When metal P is added to a solution of metal Q, no visible reaction is observed in the mixture. However, when metal R is added to the solution of metal Q, a reaction takes place and metal Q is seen to form in the solution. Arrange the metals in the order of decreasing reactivity.

- (a) (i) Cu, Fe, Mg, Ca, Na  
(ii) The more reactive the metal is the carbonate, the least tendency for it to decompose upon heating.  
(iii) Copper
- (b) R, Q, P

**02** Aluminium and iron can be extracted from their ores for useful applications.

- (a) How are the methods used for their extraction dependent upon their positions in the reactivity series ?
- (b) (i) What is the name of the main iron ore ?
- (ii) Write the chemical formula of this main iron ore.
- (iii) Explain why limestone is added in the blast furnace during the extraction of iron.

- (a) The metals which are above zinc in the reactivity series are reactive. Aluminium is above zinc, so it can only be extracted by electrolysis. Iron is below zinc, so it can be extracted by the reduction of carbon.
- (b) (i) Haematite
- (ii)  $\text{Fe}_2\text{O}_3$
- (iii) To remove impurities such as sand.

# 03

We see several things around us that are made up of metals, e.g. electrical wire (uncoated), fans, utensils, chairs (metallic), ornaments, car engine, scooter parts, etc. Given below is a table showing properties of four metals P, Q, R and S.

Metals	Melting point	Boiling point	Hardness	Malleability	Electrical/ conductivity	Corrosion resistant	Thermal conductivity
P	Low	Low	Soft	High	Conductor	No	Good
Q	Very high	Low	Hard	Low	Conductor	No	Good
R	High	High	Soft	High	Good	Yes	Poor
S	High	Low	Hard	High	Poor	No	Good

1. Which metal is used for making utensils ?
2. Identify a metal that can be used for making ornaments.
3. Heating elements in electrical appliances are made from which metal ?

1. For making utensils, the metal must be hard and a good conductor of heat. So, S is a best metal for this purpose.
2. For making ornaments, the metal should be resistant towards corrosion like gold, platinum, etc. So, R is such a metal.
3. For making heating elements, melting point of metal should be very high. So, Q is suitable.

**04**

This section contains 5 questions. The answer to each of the questions is a single digit number, ranging from 0 to 9.

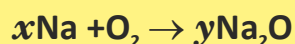
If the correct answers to question numbers X, Y, Z and W (say) are 6, 0, 9 and 2 respectively, then the correct darkening of bubbles will look like as given on the right side.

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

- Number of metals which lie above hydrogen out of the following is

Sodium, Lead, Copper, Platinum, Zinc, Mercury.

- In the following reaction, x is

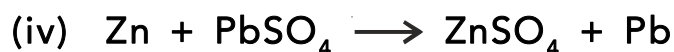
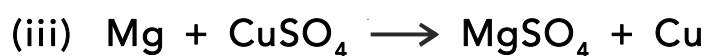
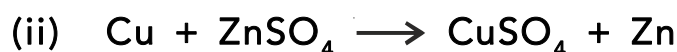


- Number of elements which form basic oxide is  
Magnesium, Aluminium, Carbon, Sulphur, Iron, Potassium, Zinc

- Number of elements which will not react even with hot water is

Sodium, Iron, Zinc, Copper, Magnesium, Silver

- Number of possible reactions out of the following is



- (3): Out of the given metals, sodium, lead and zinc are placed above hydrogen in metal activity series.
- (4): The equation is  
$$4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$$
- (5): Metals form basic oxides, e.g. magnesium, aluminium, iron, potassium and zinc.
- (2): Sodium reacts vigorously with water. Magnesium reacts with warm water, zinc reacts with boiling water. Iron reacts with steam while copper and silver do not react at all.
- (3): The order of reactivity is

$\text{Mg} > \text{Zn} > \text{Pb} > \text{Cu} > \text{Ag}$   
The more reactive metals can displace less reactive metals from their salt solutions. Thus, reactions (i), (iii) and (iv) are possible but (ii) is not possible as Cu is less reactive than Zn.

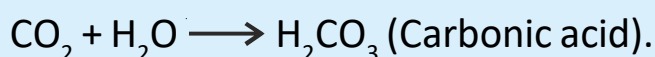
	1	2	3	4	5
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	●	2
●	3	3	3	●	●
4	●	4	4	4	4
5	5	●	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

# 05

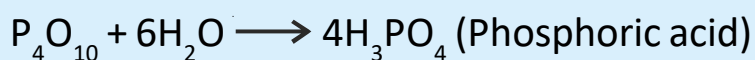
Metals and non-metals react with oxygen to form oxides at different rates. The oxides formed by metals are basic in nature while oxides formed by non-metals are acidic in nature. The nature of oxides can be determined by testing the aqueous solution of oxide with litmus paper.

1. The oxides of non-metals are acidic oxides because they dissolve in water. What do they form ?
2. Phosphorus is burnt in air to give phosphorus pentoxide. It is dissolved in water and tested with litmus paper. Which colour of litmus paper is used ? Write the change in colour.
3. Magnesium ribbon on burning in air gives a white powder which when dissolved in water turns red litmus blue. What is the nature of oxide formed ?

1. Non-metal oxides form acids when dissolved in water, e.g.



2. Phosphorus is a non-metal. Hence, phosphorus pentoxide is acidic in nature.



Blue litmus paper turns red.

3. MgO is basic in nature and forms a basic hydroxide.

