

Multiple Choice Questions

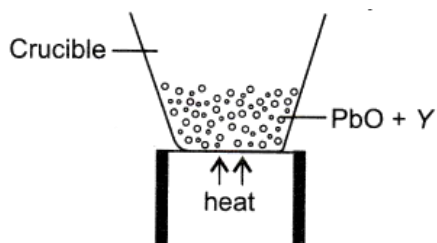
- Before keeping any eatables in the jar, Riya always keeps anhydrous CaCl_2 in the bottle to : —
 (a) To absorb moisture (b) Kill germs
 (c) To clean the bottle (d) All of these
- 2 mL each of concentrated HCl , HNO_3 , and a mixture of concentrated HCl and concentrated HNO_3 in the ratio of 3:1 were taken in test tubes labelled as A, B and C. A small piece of metal was put in each test tube. No change occurred in test tubes A and B but the metal got dissolved in test tube C respectively. The metal could be :
 (a) Cu and Au (b) Pt and Cu
 (c) Al and Au (d) Au and Pt
- Name the reducing agent in the following reaction : $3\text{MnO}_2 + 4\text{Al} \rightarrow 3\text{Mn} + 2\text{Al}_2\text{O}_3$: —
 (a) Al_2O_3 (b) Al
 (c) MnO_2 (d) Mn
- Aluminium foil is used for wrapping food because :
 (a) It is ductile (b) It is sonorous
 (c) It is malleable (d) It is good conductor of heat
- Match column I (method of concentration) with column II (principle involved) and select the appropriate option from the given codes :

	Column I		Column II
(a)	Hydraulic washing	(i)	Difference in the wetting properties of ore and gangue particles.
(b)	Froth floatation process	(ii)	Difference in magnetic properties of ore and gangue particles.
(c)	Magnetic separation	(iii)	Differences in densities of ore and gangue particles.
(d)	Baeyer's process	(iv)	Differences in chemical properties of ore and gangue particles.

- (a) (a) – (ii), (b) – (iii), (c) – (iv), (d) – (i) (b) (a) – (i), (b) – (iii), (c) – (ii), (d) – (iv)

(c) (a) – (iii), (b) – (i), (c) – (ii), (d) – (iv) (d) (a) – (iv), (b) – (ii), (c) – (iii), (d) – (i)
- Which one of the following elements symbolized as A and B is a metal : ${}^{23}_{11}\text{A}$, ${}^{40}_{20}\text{B}$?
 (a) Neither A nor B is a metal (b) Both A and B are metals
 (c) A is metal (d) B is metal

7. Observe the given figure carefully.



The residue left behind in the crucible, substance Y and the substance which can replace Y in the above process are respectively

- (a) Brown crystals of Pb_2O_3 , C and CO (b) Shiny globules of Pb, C and Mg
(c) Black mass of Pb_2O_3 , CO and Cu (d) White powder of Pb, Cu and K
8. Among the following, the metal with lowest density is :
(a) Lead (b) Magnesium
(c) Aluminium (d) Lithium
9. Which one of the following properties is not generally exhibited by ionic compounds:
(a) Electrical conductivity in solid state (b) Electrical conductivity in molten state
(c) Solubility in water (d) High melting and boiling points
10. When zinc reacts with sodium hydroxide, the product formed is:
(a) Sodium oxide (b) Zinc hydroxide
(c) Sodium zincate (d) Zinc oxide

Fill in the blanks :

11. Metals lose their shine due to the formation of layer of _____ on their surface.
12. Iron is _____ reactive than zinc.

True / False

13. Silver reacts with acids releasing hydrogen gas.
14. Non - metals form basic oxides.

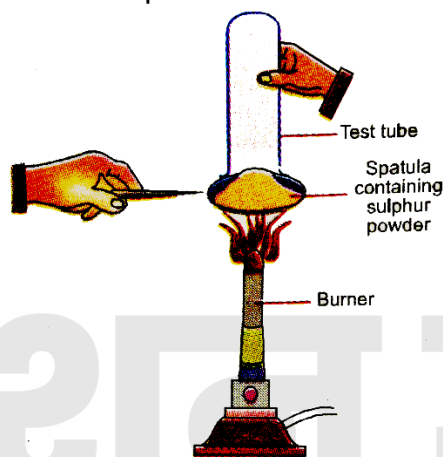
Very Short Type Questions

15. What is meant by 22 carat gold?
16. What are amphoteric oxides? Give two examples of amphoteric oxides.

Short Type Questions

17. A metal 'X' is found in the form of filings which burns vigorously when sprinkled on flame. When these filings are treated with sulphur a black coloured compound 'Y' is formed which is not attracted by magnet. 'X' reacts with dil HCl to liberate hydrogen gas. 'X' reacts with steam to form 'Z' along with hydrogen gas. Identify 'X', 'Y', and 'Z'. Write the reaction involved.

18. 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 figure below:
- What will be the action of gas on
 - dry litmus paper?
 - moist litmus paper?
 - Write a balanced chemical equation for the reaction taking place.



Essay Type Questions

19. Read the following text carefully and answer the questions that follow:

Almost all metals combine with oxygen to form metal oxides. Metal oxides are generally basic in nature. But some metal oxides show both basic as well as acidic behaviour. Different metals show different reactivities towards oxygen. Some react vigorously while some do not react at all.

- What happens when copper is heated in air? (Give the equation of the reaction involved).
- Why are some metal oxides categorized as amphoteric? Give one example.
- Complete the following equations:
 - $\text{Na}_2\text{O}(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow$
 - $\text{Al}_2\text{O}_3 + 2\text{NaOH} \rightarrow$

OR

On burning Sulphur in oxygen a colourless gas is produced.

- Write chemical equation for the reaction.
- Name the gas formed.
- State the nature of the gas.
- What will be the action of this on a dry litmus paper?

20 a. Name the following :

- i. Metal that can be cut by knife
- ii. Lustrous non-metal
- iii. Metal that exists in liquid state at room temperature
- iv. Most malleable and ductile metal
- v. Metal that is best conductor of electricity
- vi. Non-metal that can exist in different forms

b. How are alloys better than metals? Give composition of solder and amalgam

OR

- i. Give differences between roasting and calcination with suitable examples.
- ii. Explain how the following metals are obtained from their compounds by the reduction process. Give one example of each type.
 - a. Metal M which is in the middle of the reactivity series.
 - b. Metal N which is high up in the reactivity series.

HOTS

21. **Assertion (A)** : Sodium is kept in kerosene oil.

Reason (R) : Sodium reacts vigorously with air and water.

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

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Chapter-3 | Metals and Non-Metals

Worksheet-1

Answer & Solution

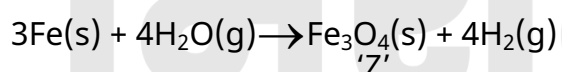
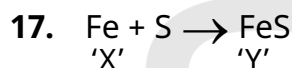


1. (a)
Anhydrous calcium chloride is used to absorb moisture or as a packaging aid to ensure dryness.
2. (d)
Test tube C posses a chemical mixture called aqua-regia. It is a mixture of concentrated HCl and concentrated HNO_3 in the ratio of 3 : 1. Aqua-regia dissolves gold and platinum in it while hydrochloric acid and nitric acid do not.
3. (b)
Aluminium is the reducing agent in this reaction. It reduces manganese dioxide (MnO_2) to manganese (Mn) and itself gets oxidized to aluminium oxide. Manganese dioxide acts as an oxidizing agent.
4. (c) It is malleable
5. (c) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv)
6. (b)
A is Sodium (Atomic number 11) and B is Calcium (Atomic number 20). Both are metals.
7. (b)
$$2\text{PbO} + \text{C} \rightarrow 2\text{Pb} + \text{CO}_2$$

(Y) (Shiny
glubules)
8. (d)
Lithium has lowest density.
9. (a)
Ionic compounds such as NaCl have a high melting point and high boiling point. They are generally soluble in water than other organic solvents since water being polar in nature breaks the ionic bonds. Ionic compounds are good conductors of electricity in their molten state but not in their solid-state.
10. (c) $\text{Zn} + 2\text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2$
Sodium zincate is formed.
11. Fill in the blank : Oxide
12. Fill in the blank : Less
13. True and False : False
14. True and False : False
15. Carat- It is a unit of purity of gold. An alloy consisting of 22 parts by weight of pure gold and 2 parts by weight of copper or silver is called 22-carat gold (22 carat gold means 22 of 24 parts of alloy are gold making it 91.6% pure). Pure gold of 24 carat is not used for making jewellery as it is very soft to hold gems and pearls.

16. Amphoteric oxides : Oxides of metals which have both acidic as well as basic behaviour are known as amphoteric oxides. Such metallic oxides react with acids as well as base to produce salt and water.

Examples of Amphoteric oxides are aluminium oxide (Al_2O_3) and zinc oxide (ZnO).

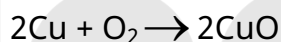


18. The gas is sulphur-dioxide (SO_2)

- It will not react with dry litmus paper.
- The gas will bleach moist litmus paper.
- The balanced chemical equation is
 $\text{S} + \text{O}_2 \xrightarrow{\text{Heat}} \text{SO}_2$

19.

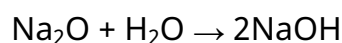
- When copper is heated in air, it reacts with the oxygen of air to form a black compound copper oxide.



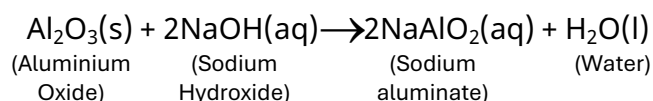
- The oxides that form salt and water by reaction with both acid and base are known as amphoteric oxides.

They show both acidic as well as basic characteristics. Aluminium oxide is amphoteric oxide as it reacts with acids as well as bases.

- (a) Overall complete and balanced chemical equation is



- (b) Overall complete and balanced chemical equation is



OR

- $\text{S}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{SO}_2(\text{g})$
- Sulphur dioxide (SO_2)
- Sulphur dioxide is a non-metal oxide and acidic in nature.
- It turns blue litmus paper to red as oxides of non-metals are acidic in nature.

20.

- Sodium (Na) / Potassium (K)
 - Iodine (I)
 - Mercury (Hg)
 - Gold (Au)
 - Silver / Copper
 - Carbon / Sulphur / Phosphorous
- Alloys are better than metals as they are generally stronger / have high tensile strength / high electrical resistivity / resistant to corrosion.

Composition of Solder:

Lead+Tin/Pb+ Sn

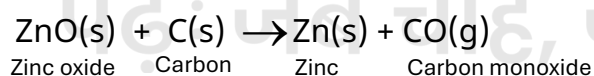
Composition of Amalgam - an alloy in which mercury is one of the constituent / Any metal + mercury

OR

i.

Roasting	Calcination
Ore is heated in the excess supply of air(oxygen)	Ore is heated in the absence or limited supply of air (oxygen)
Roasting is done for sulphide ores.	Calcination is done for carbonate ores.
SO ₂ is produced along with metal oxide.	CO ₂ is produced along with metal oxide.
e.g. $2\text{ZnS(s)} + 3\text{O}_2 \xrightarrow{\Delta} 2\text{ZnO(s)} + 2\text{SO}_2\text{(g)}$	e.g. $\text{ZnCO}_3 \xrightarrow{\Delta} \text{ZnO(s)} + \text{CO}_2\text{(g)}$

ii. a. The metal M which is in the middle of the reactivity series (such as iron, zinc, etc) is moderately reactive. Their sulphide and carbonate ore is first converted into their oxides by the process of roasting and calcination, respectively. The metal oxides (MO) are then reduced to the corresponding metals by using suitable reducing agents such as carbon, e.g. zinc metal can be obtained from its oxide as follows:



b. The metal N which is high up in the reactivity series (such as sodium, magnesium, etc) is very reactive and can be obtained by electrolysis of their molten salt and not the aqueous\ solution. These metals cannot be obtained by heating their ore alone. e.g. sodium is obtained by the electrolysis of molten sodium chloride (NaCl).

21. (a)

Sodium reacts vigorously with air and water

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