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Class: X
Subject: Chemistry
Topic: Metals and non-metals
No. of Questions: 20

1. Define the following terms.

(i) Mineral (ii) Ore (iii) Gangue

Ans: (i) Mineral: Most of the elements occur in nature as in combined state as minerals. The chemical composition of minerals is fixed.

(ii) Ore: Minerals from which metals can be extracted profitably are known as ores.

(iii) Gangue: The impurities (sand, silt, soil, gravel, etc.) present in the ore are called gangue.

2. Mica is mainly,

A. potassium aluminium silicate.
B. Calcium aluminium silicate.
C. Calcium aluminium fluoride.
D. Calcium magnesium silicate.

Ans: Potassium aluminium silicate.

3. Electrometallurgical process is employed to extract?

A. Fe
B. Pb
C. Na
D. Ag

Ans: Na

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4. What are washing soda and baking soda chemically?

Ans: Chemical formula of washing soda is Na_2CO_3. $10H_2O$ (sodium carbonate) and baking soda is $NaHCO_3$ (sodium bicarbonate).

5. Which gas is produced when dilute hydrochloric acid is added to a reactive metal? Write the chemical reaction when iron reacts with dilute H_2SO_4.

Ans: Hydrogen gas is evolved when dilute hydrochloric acid is added to a reactive metal. When iron reacts with dilute H_2SO_4, iron (II) sulphate with the evolution of hydrogen gas is formed.

6. Which pair contains species which can react with each other to produce dihydrogen gas?

A. Sodium amalgam and water
B. Hydrolith and water
C. Copper and water
D. Both (a) and (b).

Ans: (d) both (a) and (b).

7. What is not true about roasting?

A. to convert sulphides into oxides
B. to remove volatile impurities
C. to dry the ore
D. to convert the ore into fine powder

Ans: (d) to convert ore into fine powder

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8. A given non-metal forms sulphuric acid on reacting with concentrated HNO_3. Identify the non-metal.

Ans: Sulphur is non-metal forms sulphuric and on reacting with concentrated HNO_3

$S + 6HNO_3$ (conc. Nitric acid) -------> $H_2SO_4 + 6NO_2 + 2H_2O$

9. What chemical process is used for obtaining a metal from its oxide?

Ans: The chemical process used for obtaining a metal from its oxide is reduction, in this process, metal oxides are reduced by using suitable reducing agents such as carbon or by highly reactive metals to displace the metals from their oxides. For example, zinc oxide is reduced to metallic zinc by heating with carbon.

$$ZnO_{(s)} + C_{(s)} \xrightarrow{\Delta} Zn_{(s)} + CO_{(g)}$$

Manganese dioxide is reduced to manganese by treating it with aluminium powder. In this case, aluminium displaces manganese from its oxide.

$$3MnO_{2(s)} + 4Al_{(s)} \longrightarrow 3Mn_{(l)} + 2Al_2O_{3(s)} + Heat$$

Oxides of more reactive metals are reduced by electrolysis.

10. The three isotopes of hydrogen differ from one another in

A. Atomic number
B. Number of protons
C. Nuclear charge
D. Nuclear mas.

Ans: Nuclear mass.

11. SO_2

A. Turns dry blue litmus paper red
B. Turns moist blue litmus paper red
C. Turns moist red litmus paper blue

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D. None of these

Ans: (B)

12. A white powder having an odour of chlorine is used to remove yellowness of white clothes in laundries. Name this powder. How is it prepared? Write the chemical equation for the reaction involved its preparation.

Ans: White powder is bleaching powder ($CaOCl_2$). It is prepared in the laboratory by passing the chlorine gas over dry slaked lime

$Ca(OH)_2$ (Calcium hydroxide ' slaked lime') + Cl_2 (Chlorine) → $CaOCl_2$ Calcium oxychloride 'Bleaching powder') + H_2O (Water)

13. Food cans are coated with tin and not with zinc because

A. zinc is costlier than tin.
B. Zinc has a higher melting point than tin.
C. Zinc is more reactive than tin.
D. Zinc is less reactive than tin.

Ans: (c) Food cans are coated with tin and not with zinc because zinc is more reactive than tin.

14. Starting with 0.5 mol of sodium peroxide how many moles of dioxygen gas can be obtained by dropping excess of water on it

A. 0.5 MOLE
B. 1 MOLE
C. 0.25 MOLE
D. 0.125 MOLE.

Ans: (c) 0.25 mole

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15. A non-metal belonging to group V in the periodic table has two major allotropic forms. Name its two forms. Identify the element. Write two distinctions between these two forms.

Ans: Non-metal is phosphorus (P). The allotropes of phosphorus are white phosphorus (yellow phosphorus) and red phosphorus.

Distinctions:

(i) White phosphorus is soft and red phosphorus is brittle powder.
(ii) White phosphorus is poisonous while red phosphorus is non-poisonous.

16. Acidified potassium permanganate is dropped over sodium peroxide in a round bottom flask at room temperature, reaction takes place to produce

A. hydrogen peroxide
B. mixture of hydrogen and oxygen
C. a colourless gas hydrogen
D. a colourless gas dioxygen.

Ans: a colourless gas dioxygen.

17. What are amphoteric oxides? Give two examples of amphoteric oxides.

Ans: Those oxides that behave as both acidic and basic oxides are called amphoteric oxides. Examples: aluminium oxide (Al_20_3,) zinc oxide (ZnO)

18. An element has two allotropic forms A and B and belongs to group V of the periodic table, A is much darker in colour than B. Ignition temperature of A is 260°C and that of B is 30°C.

What may A and B be? Which one of them reacts with (i) chlorine on heating but not in the cold (ii) hot concentrated solution of NaOH producing a gas ? Write the chemical equations for the reactions involved.

Ans: B is yellow phosphorus and A is red phosphorus.

(i) Red phosphorus reacts and form phosphorus pentachloride.

P_4 (Red phosphorus) + $10Cl_2$ (Chlorine) $\longrightarrow$ $4PCl_5$ (Phosphorus penta chloride)

(ii) White phosphorus reacts with not concentrated solution of NaOH producing phosphine gas and form sodium hypophophite

P_4 (White phosphorus) + 3NaOH (Sodium hydroxide) + $3H_2O$--- Heat $\longrightarrow$ PH_3 (Phosphine)+ $3NaH_2PO_2$ (Sodium hypophosphite).

19. Give reasons

(a) Platinum, gold and silver are used to make jewellery.
(b) Sodium, potassium and lithium are stored under oil.

Ans: (a) Platinum, gold , and silver are used to make, jewellery because they are very lustrous. Also, they are very less reactive and do not corrode easily.

(b)Sodium, potassium, and lithium are very reactive metals and react very vigorously with air as well as water, Therefore, they are kept immersed in kerosene in kerosene oil in order to prevent their contact with air and moisture.

20. Hydrogen at the moment of its generation (newly born hydrogen) is generally called

A. Protium
B. Nascent hydrogen
C. Atomic hydrogen
D. Heavy hydrogen

Ans: Nascent hydrogen (b)