Chapter 3: Metals and Non-Metals

1. The non-metal which is liquid at room temperature is:

a) Mercury

b) Bromine

c) Carbon

d) Helium

Answer: (b) Bromine

Explanation: Bomine is the only non-metal which exists as a liquid at room temperature.

2. The number of protons in an atom of an element A is 19 then, the number of electron in its ion A+ is:

a) 18

b) 19

c) 20

d) 21

Answer: (a) 18

Explanation: In the neutral atom of an element,

3. Bauxite is an ore of

a) Iron

b) Aluminium

c) Mercury

d) Copper

Answer: (b) Aluminium

Explanation: Bauxite is a commercial ore of aluminium which consists largely of hydrated aluminium oxide, $Al_2O_3.2H_2O$.

4. The metal which is liquid at room temperature is

a) Bromine

b) Mercury

c) Iodine

d) Potassium

Answer: (b) Mercury

Explanation: Mercury is the only metal which exists as a liquid at room temperature.

5. The sulphide ores are converted into oxides by heating strongly in the presence of excess air. This process is known as

a) Roasting

b) Smelting

c) Calcination

d) Refining

Answer: (a) Roasting

Explanation: The process of heating the sulphide ore strongly in the presence of air to convert it into metal oxide, is known as roasting.

6. In electrolytic refining, the cathode is made up of

a) Pure metal

b) Impure metal

c) Alloy

d) Metallic salt

Answer: (a) Pure metal

Explanation: In electrolytic refining of a metal, the cathode is made up of pure metal whereas the anode is made up of impure metal.

7. In the given reaction, $Al_2O_3 + NaOH \rightarrow \ldots\ldots X\ldots\ldots + H_2O$

What is element X?

a) $NaAlO_2$

b) Na_3Al

c) Na_2O_3

d) $NaAl_2O_3$

Answer: (a) $NaAlO_2$

Explanation: Aluminium oxide is amphoteric in nature, i.e., it reacts with acids as well as bases to form salt and water.

Here, aluminium oxide behaves as an acid as it reacts with NaOH, a base and forms sodium aluminate ($NaAlO_2$) and water:

$$Al_2O_3 + NaOH \rightarrow 2NaAlO_2 + H_2O$$

8. Which of the following represent the correct order of decreasing reactivity?

a) Mg > Al > Zn > Fe

b) Mg > Zn > Al > Fe

c) Al > Zn > Fe > Mg

d) Mg > Fe > Zn > Al

Answer: (a) Mg > Al > Zn > Fe

Explanation: The decreasing order of the reactivity of the common metals is given below:

Li, K, Na, Ba, Ca, Mg , Al, Mn, Zn, Fe, Ni, Sn, Pb, [H], Cu,Hg, Ag, Au,Pt

9. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be

(a) Ca

(b) C

(c) Si

(d) Fe

Answer: (a) Ca

Explanation:

Calcium reacts with oxygen to give calcium oxide (CaO) which is having a high melting point and dissolves in water to form calcium hydroxide (Ca(OH)2)along with the release of large amount of thermal energy.

10. Which of the following pairs will give displacement reactions?

(a) NaCl solution and copper metal

(b) MgCl2 solution and aluminium metal

(c) FeSO4 solution and silver metal

(d) AgNO3 solution and copper metal

Answer: (d) AgNO3 solution and copper metal

Explanation: Copper (Cu) being more reactive than silver (Ag), displaces silver from silver nitrate (AgNO3) to form copper nitrate

$$2AgNO3 + Cu \rightarrow Cu(NO3)2 + 2Ag$$

11. Which among the following is the most abundant metal found in the earth's crust?

(a) Magnesium

(b) Aluminium

(c) Oxygen

(d) Iron

Answer: (b) Aluminium

Explanation: Aluminium is the most abundant metal found in the earth's crust.

12. Which of the following pairs of reactants will go undergo a displacement reaction?

(a) $CuSO_4$ + Fe

(b) $ZnSO_4$ + Fe

(c) $MgSO_4$ + Fe

(d) $Ca(SO_4)_2$ + Fe

Answer: (a) $CuSO_4$ + Fe

Explanation: As per the reactivity series of metals, iron is more reactive than copper metal so it can displace copper from copper sulphate solution and form iron (II) sulphate and copper:

13. Galvanisation is a method of protecting steel and iron from rusting by coating them with a thin layer of

(a) Copper

(b) Aluminum

(c) Zinc

(d) Bauxite

Answer: (c) Zinc

Explanation: In this method a thin layer of zinc metal is deposited over the surface of steel or iron objects, which does not corrode on exposure to damp air and prevents the coated metals from rusting.

14. Which of the following alloys contains a non-metal as one of its constituents?

(a) Steel

(b) Brass

(c) Amalgam

(d) Bronze

Answer: (a) Steel

Explanation: Stainless steel is an alloy of iron (a metal) and carbon (a non metal).

15. An element X is soft and can be cut with the help of a knife. It is very reactive to air and cannot be kept open in the air. It reacts vigorously with water. Identify the element from the following:

(a) Mg

(b) Na

(c) P

(d) Ca

Answer: (b) Na

Explanation: Na is a metal which is soft enough to be cut with a knife. It is so reactive that it reacts vigorously with air or moisture and catches fire when kept in open. So to prevent it from coming in contact with oxygen and moisture, it is kept in kerosene.