

10th Science Important Case Study Questions for Metals And Non-Metals 2024

10th Standard

Science

SECTION A

2 x 4 = 8

1) The chemical reactivity of an element depends upon its electronic configuration. All elements having less than eight electrons in the outermost shell show chemical reactivity. During chemical reactions, atoms of all elements tend to achieve a completely filled valence shell. Metals are electropositive in nature. They have tendency to lose one or more electrons present in the valence shell of their atoms to form cations and achieve nearest noble gas configuration. The compounds formed by the transfer of electrons from one element to other are known as ionic or electrovalent compounds.

(i) The electronic configurations of three elements X, Y and Z are:

X : 2 Y: 2, 8, 7 Z : 2, 8, 2

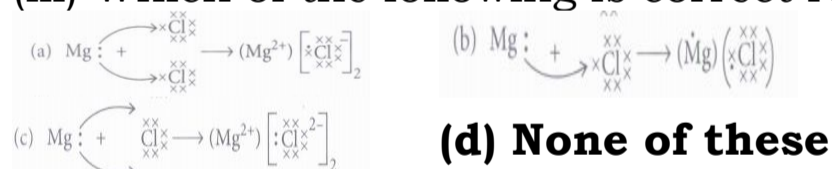
Which of the following is correct regarding these elements?

- (a) X is a metal. (b) Y is a metal.
 (c) Z is a non-metal. (d) Y is a non-metal and Z is a metal

(ii) Element X reacts with element Y to form a compound Z. During the formation of compound Z, atoms of X lose one electron each whereas atoms of Y gain one electron each. Which of the following properties is not shown by compound Z?

- (a) High melting point
 (b) Low melting point
 (c) Occurrence as solid
 (d) Conduction of electricity in molten state

(iii) Which of the following is correct representation of formation of magnesium chloride?



(iv) The electronic configuration of sodium ion is

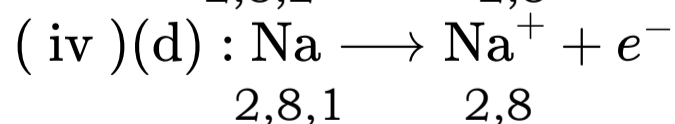
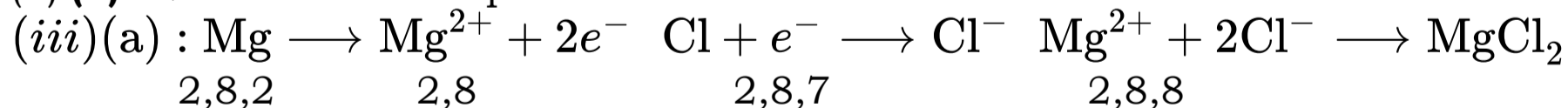
- (a) 2,8,8 (b) 2,8,2. (c) 2,6 (d) 2,8.

(v) Which of the following represents an electropositive element?

- (a) 2,8,6 (b) 2,8,8 (c) 2,8,8,1 (d) 2, 7

Answer : (i) (d)

(ii) (b): '2' is an ionic compound



(v) (c): (a) and (d) represent electronegative elements and (b) represents a noble gas.

2) An element is a pure substance made up of same kind of atoms. At present, nearly 118 elements are known but all of them do not occur free in nature, some of them have been synthesized by artificial methods. Based on their properties, they are mainly classified as metals and non-metals. Metals are those elements which lose electrons and form positive ions i.e., they are electropositive in nature. They are generally hard, good conductors of heat and electricity, malleable, ductile and have striking lustre. They have a significant role to play in our daily life.

(i) Metals which are of vital importance to the national defence, energy and industry sector are called strategic metals. Which of the following is a strategic metal?

- (a) Titanium (b) Zirconium (c) Manganese (d) All of these

(ii) Which metal is the best conductor of electricity?

- (a) Silver (b) Platinum (c) Nickel (d) Iron

(iii) Which of the following metals is not a coinage metal?

- (a) Copper (b) Silver (c) Iron (d) Gold

(iv) Which of the following are the most malleable metals?

- (I) Sodium
(II) Gold
(III) Potassium
(IV) Silver

- (a) (I) and (IV) (b) (II) and (III) (c) (III) and (IV) (d) (II) and (IV)

Identify the correct statement(s).

(I) The wires that carry current in our homes have a coating of PVC or a rubber like material.

(II) School bells are made of metals.

(III) Metals do not conduct electricity.

(IV) Metals which produce a sound on striking a hard surface are said to be non-sonorous.

- (a) (I) and (III) (b) (I) and (II) (c) (III) and (IV) (d) Only (II)

Answer : (i) **(d):** Titanium, zirconium and manganese are used in defence equipments as they are light and durable and therefore, are called strategic metals.

(ii) **(a)**

(iii) **(c):** Copper, silver and gold are called coinage metals because they are used in making coins, jewellery etc.

(iv) **(d)**

(v) **(b):** Metals conduct electricity. Metals which produce a sound on striking a hard surface are said to be sonorous.