

Class 9 CBSE Test paper Solved Chapter 3: Structure of atoms - 6

1. Q. The electronic configuration of potassium (K) is 2, 8, 8, 1 instead of 2, 8, 9 though the M shell can accommodate up to 18 electrons. Explain.

Ans: No shell can accommodate more than 8 electrons being outermost shell.

2. Q. If chlorine atom is available in the form of two isotopes ${}_{17}^{35}\text{Cl}$ (75%) and ${}_{17}^{37}\text{Cl}$ (25%) Calculate the average atomic mass of chlorine atom.

Ans: the average atomic mass of chlorine atom = $\frac{35 \times 75}{100} + \frac{37 \times 25}{100} = 35.5 \text{ u}$

3. Q. $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$ (Relative atomic masses C = 12, O = 16). The ratio of their masses to form one mole CO_2 is : (a) 1 : 2 (b) 2 : 1 (c) 8 : 3 (d) 3 : 8

Ans: (d) 3 : 8

4. Q. To verify the law of conservation of mass, a student added 5mL 10% Barium Chloride into 5mL 10% sodium sulphate solution. Which of the following is the correct observation ?

- (a) Yellow precipitate is formed. (b) The solution turn to pink colour.
(c) White precipitate is formed. (d) A clear solution is formed.

Ans: (c) White precipitate is formed

5. Q. Study the composition of the two nuclei of two atomic species L and M and give the relation between the two. L = protons 20 neutrons 20 M = protons 18 neutrons 22

Ans: Mass no. of L = 20 + 20 = 40 and Mass no. of K = 18 + 22 = 40

6. Q (a) Which kind of elements have tendency to lose electron ? Give example. (b) What are nucleons ?

Ans: (a) Metals are the elements having 1, 2 or 3 electron in their valence shells have tendency to lose electrons. E.g. Na-2, 8, 1 so it losses 1 electron.

(b) Proton and neutron in the nucleus of atoms.

7. Q. Why chlorine always has relative mass about 35 u?

Ans: chlorine atom is available in the form of two isotopes ${}_{17}^{35}\text{Cl}$ (75%) and ${}_{17}^{37}\text{Cl}$ (25%) so chlorine always has relative mass about 35 u .

Relative Atomic Mass = $\{(75/100) \times 35\} + \{(25/100) \times 37\} = 35.5 \text{ u}$

8. Q. Mention two uses of isotopes in the field of medicine

Ans: two uses of isotopes in the field of medicine are:

- (i) Isotope of cobalt is used in treatment of cancer
(ii) Isotope of iodine is used in treatment of goitre

9. Q. Why Isotopes have similar chemical properties?

Ans: Isotopes have same valence electrons therefore they have similar chemical properties?

For example ${}_{17}^{35}\text{Cl}$ and ${}_{17}^{37}\text{Cl}$

10. Q. A table showing the number of protons, neutrons and electrons in some atoms is given below

Atom	Proton	Neutron	Electron
A	10	10	8
B	17	18	18
C	10	10	10

State the following by referring to the table :

- (a) Which one is an inert gas atom ? (b) Which atom will form an anion ?
 (c) Which atom will form a cation ?

Ans:

Atom	Electron	Electronic configuration
A	8	2,6
B	18	2,8,8
C	10	2,6,2

(a) B is inert gas atom (b) Atom A will form an anion (c) atom C will form a cation

11. Q. Write the electronic configuration of magnesium atom and magnesium ion. How do these configurations differ? Support your answer in the form of atomic structures.

Ans Atomic number of magnesium atom (Mg) : 12 Electronic configuration = 2,8,2

Here Magnesium atom loses 2 atom to form ion

Atomic number of magnesium ion (Mg^{+2}) : 10 Electronic configuration = 2,8,0

12. Q. (a) Write the no. of valence electrons in

(a) (i) Na atom and Na^+ ion (ii) O atom and O^{-2} ion

(b) An element "E" loses $2e^-$ to form E^{+2} ion. What will be the chemical formula of the compound formed between E and oxygen.

Ans: (a) (i) No. of valence electrons in Na atom = 1 (2,8,1) and no. of valence electrons in Na^+ ion = 8 (2,8) (ii) No. of valence electrons in O atom = 6 (2,6) and No. of valence electrons in O^{-2} ion = 8 (2,8)

(b) the chemical formula of the compound formed between E and oxygen = E_2O