CBSE TEST PAPER-02

CLASS - XI CHEMISTRY

(Structure of Atom)

General Instruction:

- All questions are compulsory.
- Marks are given alongwith their questions.

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1. Name the scientist who first gave the atomic model. [1]
2. What is an isotope? [1]
3. What are isobars? [1]
4. What are isotones? [1]
5. What is an atomic number? [1]
6. What is a mass number? [1]
7. Find out atomic number, mass number, number of electron and neutron in an element $^{40}_{20}\times$? [2]
8. Give the main features of Thomson's Model for an atom. [2]
9. Give the drawbacks of J.J. Thomson's experiment. [1]
10. What did Rutherford conclude from the observations of $\alpha - ray$ scattering experiment? [2]
11. Why Rutherford's model could not explain the stability of an atom? [1]

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CLASS - XI CHEMISTRY [ANSWERS]

Ans1. J.J. Thomson, in 1898 first proposed the atomic model called raising-pudding model.

Ans2. Atoms of the same elements having same atomic number but different mass number are called isotopes.

$eg: {}_{1}^{1}H, {}_{1}^{2}H \ and \ {}_{1}^{3}H$

${}_{17}^{35}Cl, {}_{17}^{37}Cl \ / \ {}_{6}^{12}C, {}_{6}^{13}C, {}_{6}^{14}C$

Ans3. Atoms of different elements which have same mass number but different atomic nos.

eg: ${}_{6}^{14}C, {}_{7}^{14}N$

${}_{18}^{40}Ar, {}_{19}^{40}K, {}_{20}^{40}Ca$

Ans4. Atoms of different elements which contains the same number of neutron.

eg. ${}_{6}^{14}C, {}_{7}^{15}N, {}_{8}^{16}O$

Ans5. Atomic number is defined as the number of protons presents in the nucleus of an atom or the number of electron present in a neutral atom of an element.

Ans6. Maas number of an element is the sum of number of proton and neutron present in the nucleus of an atom.

Ans7. The mass no. of $\times$ is 40

The atomic no. of $\times$ is 20

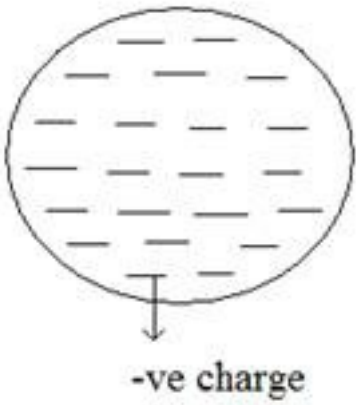
No. of proton is = Z – A = 40 – 20 = 20

No. of electron its (A) = 20

No. of proton is (A) = 20

Ans8. J.J. Thomson proposed that an atom consists of a spherical sphere (radius of about 10^{-10}m)in which the positive charges are uniformly distributed the electrons are embedded into it in such a manner so as to give stable electrostatic arrangement.

This model is also called raisin pudding model.



Ans9. (i) It could not explain the origin of the spectral lines of hydrogen and other atoms,
(ii) It failed to explain scattering of $\alpha - particles$ in Rutherford's scattering experiment.
Ans10. Rutherford proposed the nuclear model of an atom as
(i) The positive charge and most of the mass of an atom was concentrated in an extremely small region. He called it nucleus.
(ii) The nucleus is surrounded by electrons that move around the nucleus with a very high speed in orbits.
(iii) Electron and nucleus are held together by electrostatic forces of attraction.
Ans11. According to the electromagnetic theory of Maxwell, charged particles when accelerated should emit electromagnetic radiation. Therefore, an electron in an orbit will emit radiation; the orbit will then continue to shrink which does not happen in an atom.