



# CHEMISTRY

## NCERT - NCERT CHEMISTRY(HINGLISH)

### STRUCTURE OF THE ATOM

#### Solved Example

1. What are canal rays?



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2. If an atom contains one electron and one proton, will it carry any charge or not?



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3. On the basis of Thomson's model of an atom, explain how the atom is neutral as a whole.



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4. On the basis of Rutherford's model of an atom, which sub-atomic particle is present in the nucleus of an atom?



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5. Draw a sketch of Bohr's model of an atom with three shells.



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6. What do you think would be the observation if the  $\alpha$ -particle scattering experiment is carried out using a foil of a metal other than gold ?



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7. Name the three sub-atomic particles of an atom.



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**8.** Helium atom has an atomic mass of 4 u and two protons in its nucleus. How many neutrons does it have?



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**9.** Write the distribution of electrons in carbon and sodium atoms.



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**10.** If K and L shells of an atom are full, then what would be the total number of electrons in the atom?



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**11.** How will you find the valency of chlorine, sulphur and magnesium ?



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**12.** If number of electrons in an atom is 8 and number of protons is also 8, then (i) what is the atomic number of the atom? and (ii) what is the charge on the atoms ?



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**13.** With the help of Table 4.1, find out the mass number of oxygen and sulphur atom.



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14. For the symbol H,D and T tabulate three sub-atomic particles found in each of them.



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15. Write the electronic configuration of any one pair of isotopes and isobars.



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**Exercise**



1. Compare the properties of electrons, protons and neutrons.



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2. What are the limitations of J.J. Thomson's model of the atom?



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3. Describe Rutherford atom model. What are the drawbacks of this model?



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4. What are the postulates of Bohr's model of an atom?



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5. Compare all the proposed models of an atom given in this chapter.



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6. Summarise the rules for writing of distribution of electrons in various shells for the first eighteen elements



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7. Define valency by taking examples of silicon and oxygen.



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8. Explain with examples (i) Atomic number, (ii) Mass number, (iii) Isotopes and (iv) Isobars.

Give any two uses of isotopes



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9.  $Na^+$  has completely filled K and L shells. Explain.



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10. Calculate the atomic mass (average) of chlorine using the following data:

	% natural abundance	Molar mass
$^{35}\text{Cl}$	75.77	34.9689
$^{37}\text{Cl}$	24.23	36.9659



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11. A sample of oxygen atoms contain only  $^{16}_8\text{O}$  and  $^{18}_8\text{O}$  isotopes. If the average atomic mass of the sample is 16.8, then identify the options which is/are correct ?



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12. If  $Z = 3$ , what would be the valency of the element? Also, name the element



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13. Composition of the nuclei of two atomic species X and Y are given as under

	X	Y
Protons =	6	6
Neutrons =	6	8

Give the mass numbers of X and Y. What is the relation between the two species?



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**14.** A neutron is formed by an electron and a proton combining together. Therefore, it is neutral.



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**15.** The mass of an electron is about  $\frac{1}{2000}$  times that of proton.



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**16.** An isotope of iodine is used for making tincture iodine, which is used as a medicine.



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17. Rutherford's experiment on the scattering of  $\alpha$  particle showed for the first time that the atom has

A. Atomic Nucleus

B. Electron

C. Proton

D. Neutron

**Answer: A::C**



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**18.** Isotopes of an element have

- A. the same physical properties
- B. different chemical properties
- C. different number of neutrons
- D. different atomic numbers.

**Answer: B::D**



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19. Number of valence electrons in  $Cl^-$  ion are:

A. 16

B. 8

C. 17

D. 18

**Answer: option 2**



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20. Which one of the following is a correct electronic configuration of sodium?

A. 2, 8

B. 8, 2, 1

C. 2, 8, 1

D. 2, 8, 1

**Answer: A::B**



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21. Complete the following table.



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**True False**

1. J.J. Thomson proposed that the nucleus of an atom contains only nucleons.



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