



# CHEMISTRY

## BOOKS - MBD

### STRUCTURE OF ATOM

#### 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 molecule of an atom ?



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



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6. Name the three sub-atomic particles of an atom,



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



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**9.** If K and L shell of an atom are full then what would be the total number of electrons in it ?



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



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**11.** 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 atom ?



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**12.** If number of electrons in an atom are 8 and number of protons are also 8,then :What is

the charge on the atom?



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**13.** find out the mass of oxygen and sulphur atom.



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**14.** For the symbol H,D and T tabulate three fundamental 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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**16.** Compare the properties of electron, proton and neutron



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**17.** What are the limitations of J.J. Thomson model of atom ?



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**18.** What are the limitations of Rutherford's model of atom ?



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**19.** Describe Bohr's model of atom.



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20. Compare all the proposed models of atom given in the chapter 3 of the text.



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21. Summarize the rules for writing of distribution of electrons in various shells for the first eighteen elements.



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**22.** Define valency by taking examples of silicon and oxygen.



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**23.** Explain with examples : Atomic number



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**24.** Explain with examples : Mass number





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25. Explain with examples : Isotopes



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26. Explain with examples : Isobars.



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

Explain.



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28. If bromine atom is in the form of say isotopes  ${}_{35}^{79}Br$  (49.7%) and  ${}_{35}^{81}Br$  (50.3%) then calculate the average mass of bromine atom.



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**29.** The average atomic mass of a sample of an element X is 16.2 u, what are the percentages of isotopes  ${}^1_8\text{X}$  and  ${}^{18}_8\text{X}$  in the sample?



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



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**31.** Composition of the nuclei of two atomic species X and Y are given as under : Give the mass numbers of X and Y. What is the relation between the two species ?

X	Y
6	6
6	8



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**32.** (true/false) J.J. Thomson proposed that the nucleus of an atom contains only nucleons.



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**33.** (true/false) A neutron is formed by an electron and a proton combining together. Therefore, it is neutral



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**34.** (true/false) The mass of an electron is about  $1/2000$  times that of proton.



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**35.** (true/false) Isotope of iodine is used for making tincture iodine, which is used as a medicine



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**36.** Put tick ( $\checkmark$ ) against correct choice and cross (x) against wrong choice in following question : Rutherford's alpha-particle scattering experiment was responsible for the discovery of:

A. Atomic Nucleus

B. Electron

C. Proton

D. Neutron

**Answer:**



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**37.** Put tick ( $\checkmark$ ) against correct choice and cross (x) against wrong choice in following question : Isotopes of an element have :

A. The same physical properties

B. Different chemical

C. Different number of neutrons

D. Different atomic number

**Answer:**



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**38.** Put tick ( $\checkmark$ ) against correct choice and cross (x) against wrong choice in following

question : Number of valence electrons in

$Cl^-$  ion are:

A. 16

B. 8

C. 17

D. 18

**Answer:**



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

A. 2,8

B. 8, 2, 1

C. 2, 1, 8

D. 2, 8, 1

**Answer:**



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**40.** Complete the following table:

Atomic Number	Mass Number	Number of Neutrons	Number of Protons	Number of Electrons	Name of the Atomic Species
9	–	10	–	–	–
16	32	–	–	–	Sulphur
–	24	–	12	–	–
–	2	–	1	–	–
–	1	0	1	0	–



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**41.** What is Rutherford's  $\alpha$ -ray scattering experiment ? Give its observations. How does Rutherford explain these observations ?



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**42.** Most of the  $\alpha$ -particles passed through the gold foil without any deflection from their original path.



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**43.** Discuss in brief Rutherford's Model of atom.



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**44.** Give the electronic distribution in the first twenty elements on the basis of Bohar-Bury scheme.



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**45.** Define the terms: Atomic number



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**46.** Define the terms : Mass number





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**47.** Define the terms : Atom



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**48.** Define the terms : Ion



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**49.** Define the terms : Element



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**50. Define the terms : Orbit**



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**51. Define the terms : Nucleons**



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**52.** What do you understand by the structure of atom



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**53.** What happens when electric field is applied to the path of cathode rays ? What does it show ?



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**54.** What is the information conveyed by the following observations :Atom is electrically neutral.



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**55.** What is the information conveyed by the following observations Mass of the atom is due to the nucleus.



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**56.** What is the significance of number of protons found in the atoms in each of the different elements ?



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**57.** Write the electronic configuration of the elements A, B, C, D, E with atomic numbers 5, 6, 14, 13 and 15. Which have similar chemical properties ?



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**58.** Helium has only 2 electrons in the K-shell.

But it is called an inert gas element. Why?



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**59.** An atom has mass number  $A$  and atomic number  $Z$ . How many protons are present in the nucleus ?



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**60.** An atom has mass number  $A$  and atomic number  $Z$ .) How many electrons are revolving around the nucleus ?



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**61.** An atom has mass number  $A$  and atomic number  $Z$ . How many neutrons are present in its nucleus ?



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**62.** State three ways by which a proton differs from an electron.



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**63.** What are isotopes ? Give two uses of isotopes. Name the isotopes of hydrogen. Give their structures.



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**64.** Explain why elements have fractional atomic masses ?



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**65.** What are isobars ? Give examples



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**66.** Sulphur has an atomic number 16 and a mass of 32. State the number of protons and

neutrons in the nucleus of sulphur. Give a simple diagram to show the arrangement of electrons in an atom of sulphur.



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67. Write down the electronic configuration of the following :  ${}_{13}^{27}X$



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**68.** Write down the electronic configuration of the following :  ${}_{17}^{35}\text{X}$



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**69.** Give the important properties or characteristics of isotopes.



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70. An atom of the element is represented as

${}_{23}^{61}\text{X}$  ? What does the numeral 23 indicate ?



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71. An atom of the element is represented as

${}_{23}^{61}\text{X}$  ? What does the numeral 61 indicate ?



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72. An atom of the element is represented as

${}_{23}^{61}\text{X}$  ? What is the number of protons in X ?



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73. The atom of an element is made up of 4 protons, 5 neutrons and 4 electrons. What are its atomic number and mass number ?



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74. Calculate the number of neutrons in the following elements  ${}^3_1H$



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75. Calculate the number of neutrons in the following elements  ${}^{37}_{17}Cl$



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76. Calculate the number of neutrons in the following elements  ${}_{18}^{40}\text{Ar}$



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77. Give two conditions under which cathode rays are produced.



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**78.** The electronic configuration of P ( $Z=15$ ) is 2, 8, 5, why is the valency of phosphorus is 3 and not 5 ?



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**79.** What information is conveyed by the statement that the mass number of magnesium is 24 and the atomic number is 12 ?



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**80.** Is it possible for an atom to have 12 protons and 13 electrons ? Explain



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**81.** Give the important isotopes of hydrogen, carbon, oxygen and chlorine. Indicate their mass numbers and atomic numbers



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**82.** Chlorine has two isotopes  ${}_{17}^{35}\text{Cl}$  And  ${}_{17}^{37}\text{Cl}$  in the ratio 3:1. Calculate the average atomic mass of chlorine.



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**83.** Out of  $18\text{X}$  and  $16\text{Y}$  which atom is chemically more reactive ?



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**84.** An element has 12 neutrons and mass number 23. Give the atomic number and symbol of the element.



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**85.** Calculate number of protons, neutrons and electrons in  ${}_{92}^{235}\text{U}$  and  ${}_{92}^{238}\text{U}$ . How are these atoms related ?



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**86.** Calculate the number of electrons, protons and neutrons in  ${}_{9}^{19}\text{X}$ . Also calculate its valency.



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**87.** Who discovered canal rays ?



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**88.** Which charge is present on canal ray particles ?





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**89.** Which charge is present on protons ?



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**90.** Where are protons present in an atom ?



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**91.** What were the characteristics of an atom according to Dalton ?



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**92.** Which discovery is against Dalton's theory ?



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**93.** Who proposed the first model for the structure of atom ?



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**94.** Why did Rutherford used gold foil in a-ray scattering experiment ?



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**95.** What are  $\alpha$ -particles?



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96. What is the charge on  $\alpha$ -particles ?



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97. What is the mass of an  $\alpha$ -particle ?



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**98.** How the defects of Rutherford's model were removed by Neil Bohr ?



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**99.** What are energy levels or shells ?



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**100.** Define mass number of an element.



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**101.** Who gave the distribution of electrons in the various shells of an atom ?



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**102.** What is the maximum number of electrons present in an electronic shell ?



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**103.** What is the maximum first four shells of an atom ?



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**104.** What is the maximum number of electrons in the outermost shell of an atom ?



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**105.** Which element are Chemically inert?



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**106.** Define valency of an element



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**107.** Define octet.



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**108.** Define valency of an element.



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**109.** Define atomic number.



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**110.** Define nucleon



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**111.** Where is most of the mass of the element present?



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**112.** Define atomic mass of an element.



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**113.** What are isotopes?



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**114.** Write two isotopes of chlorine.



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**115.** Write two isotopes of carbon



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**116.** Isotope of which element is used in atomic reactor?



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**117.** Isotope of which element is used for the treatment of goitre ?



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**118.** What are isobars ?



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**119.** Give one example of isobars ?



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**120.** Write three isotopes of hydrogen.



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**121.** What is the total number of electrons in an atom if its K-and L-shells are fully filled ?



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**122.** What electrons in an atom influence its chemical properties ?



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**123.** How will you represent chlorine atom having mass number 35 and atomic number 17 ?



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**124.** Name the sub-atomic particle on which size of an atom depends ?



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**125.** Name the atoms having same atomic number but different mass numbers



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**126.**  $Mg^{2+}$  has 10 electrons What is the number of protons in it?



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**127.** Name the element which has no neutrons in the nucleus of its atom.



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**128.** Out of electrons, protons and neutrons, which are same in isotopes ?



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**129.** There are three isotopes of hydrogen  ${}^1_1H$  ,  
 ${}^2_1H$ ,  ${}^3_1H$  all are electrically neutral, why ?



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**130.** An element has atomic number 16. Give its electronic configuration and number of valence electrons.



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**131.** The number of electrons in the valence shell of sodium (Na) is.....



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**132.** Fluorine belongs to..... Family.



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**133.** In an atom, the number of.....is the same as number of..... .



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**134.** Isotopes of an element are.....because they have..... number of electrons and protons.



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**135.** The number of electrons in the valence shell of an atom cannot be ..... .



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