Atomic structure pdf ncert

NCERT Solutions for Class 9 Science Chapter 4 Atom Structure in BYJU'S provides students with solutions to all the issues provided in the NCERT Class 9 textbook, which is on the CBSE board line. This article provides students with the raw research material, which is developed by a group of experts with a deep knowledge of the subject. The NCERT solution will allow students to score maximum points on the CBSE exam. The language used in the preparation of solutions by our experts at BYJU'S is an experienced and understanding of 9th grade students, thus helping them to better understand the concept. This is based on a conceptual approach. When preparing NCERT decisions, the response method, which is encouraged by CBSE and therefore the selection of marks in exams, is taken into account for students to present their answers accordingly and therefore to score maximum grades. The NCERT tutorial provided by the council is designed by the team to take into account the latest in science and technology. Download PDF NCERT Solutions for Class 9 Science Chapter 4 - Structure Of Atom Access Science Answers NCERT Class 9 Chapter 4 - Atom Structure (All Text and Exercise Issues Resolved) Exercise-4.1 Page: 47 1. What are channel beams? Solution: The radiations that are positively charged are the rays of the channel. This discovery was decisive in the discovery of another subatomic particle that was positively charged - a proton. 2. If the atom contains one electron and one proton, will it carry any charge or not? Solution: Because the proton is a positively charged particle and the electron is a negatively charged particle, the net charge becomes neutral as both particles neutralize each other. Exercise-4.2 Page: 49 1. Based on the Thompson atom model, explain how neutral the atom is overall. Solution: According to Thompson's atom model, i) the atom contains a positively charged sphere in which negatively charged electrons are implanted. Electrons and protons are equal in size, so the atom as a whole is electrically neutral. 2. Based on the model of Rutherford's atom, whose subatomic particle is present in the nucleus of the atom? Solution: According to Rutherford's atom model, positively charged protons are those present in the atom. 3. Draw a sketch of the Bora model with three shells. Solution: 4. What do you think would be the observation ∝ particle scattering experiment is conducted using metal foil other than gold? Solution: In ∝ - particle scattering experiment, when any other metal foil is used instead of gold, the observation will remain the same. This is because the structure of the atom, if viewed individually remains the same. Exercise-4.2.4 Page: 49 1. Name subatomic particles of the atom. Solution: The atom consists of three subatomic particles: Protons - positively charged electrons - negatively charged neutrons - neutral in nature (free) 2. The helium atom has a atomic mass of 4 you and two protons in its nucleus. How many neutrons does he have? Solution: Considering: Atomic mass of helium atom No. 4u, 2 protons in the helium nucleus Atomic mass - number of protons - number of neutrons 4 and 2 - number of neutrons Number of neutrons Number 4 - 2 and 2 Hence, helium has 2 neutrons. Exercise-4.3 Page: 50 1. Write the distribution of electrons in carbon and sodium atoms. Solution: Distribution of electrons in carbon atoms: The atomic carbon number is 6 The number of electrons equal to the number of protons in a carbon atom, i.e. 6 Electron distribution in carbon atom K - 2, L - 4 Distribution of electrons in sodium atoms: the atomic number of sodium is 11 Number of electrons equal to the number of protons in the sodium atom, i.e. , 11 Distribution of electrons in the sodium atom is K - 2, L - 8, M - 1 2. If the K and L atom shells are full, what will be the total number of electrons in the atom? Solution: The K shell can enter 2 electron L shells can enter 8 electrons so when both shells are full, the total number of electrons present in the atom is 2'8 and 10 electrons. Exercise-4.4 Page: 52 1. How do you find the valence of chlorine, sulfur and magnesium? Solution: A certain combination of the atom capacity of each element, in which electrons are lost, acquired or divided to make an octet of electrons present in the outer shell, is defined as valence. To measure valence, we can figure out the number of electrons that are needed to complete the shell in which it is contained or the loss of excess electrons if present as soon as the filling is complete. To find the valence of chlorine: the atomic amount of chlorine is 17 The number of electrons equal to the number of protons in chlorine i.e. 17 The distribution of electrons in the chlorine atom K - 2, L - 8, M - 7 Therefore, from the distribution of chlorine clearly shows that to fill the shell M requires only one electron. Therefore, its valence is -1. i.e. one electron less to find sulphur valence: the atomic amount of sulfur is 16 The number of electrons equals the number of protons in sulfur i.e. 16 The distribution of electrons in the sulfur atom K - 2, L - 8, M - 6 Therefore, from the distribution of sulfur clearly shows that to fill the shell M requires two more electrons. Therefore, its valence is -2, i.e. two electrons less. To find magnesium valence: Atomic magnesium is 12 The number of electrons equal to the number of protons in magnesium i.e., 12 Electron distribution in the magnesium atom K - 2, L - 8, M - 2 Hence, from the distribution of magnesium is it is obvious that six more electrons are needed to fill the M shell. But the M shell has only two electrons. It has smaller electrons than is needed to fill the shell. So we say that the magnesium atom is not stable, since the M shell has 2 electrons. Its valence is 2 euros, which means that it has 2 electrons in excess. Exercise-4.5 Page: 52 1. If the number of electrons in atom 8 and the number of protons is also 8, then (i) What is the atomic number of the atom? and (ii) What is a charge on an atom? Solution: Considering: The number of electrons 8 Number of protons No. 8 (a) Atomic number of atoms is the same as the number of protons in this atom, hence its atomic number is 8. (b) The number of protons in the atom is equal to the number of electrons. Therefore, both accusations - positive and negative neutralize each other. Thus, the atom has no charge. 2. Using this table, find out the massive amount of oxygen and sulfur atom. Table: Composition of atoms of the first eighteen elements with the distribution of electrons in different shells. Title Element Symbol Atomic Number Number of Protons Number of Neutrons Number of Electrons Electrons Electrons Distribution of Electrons K L M Valency Hydrogen Helium Lithium Beryllium Boron Nitrogen Oxygen Oxygen Fluorine Neon Sodium Magnesium He Li Be B N N F Ne Mg 1 2 3 4 5 6 7 8 9 1 0 11 12 1 2 2 3 4 5 6 7 8 9 11 12 - 2 4 5 6 6 7 8 10 12 12 2 3 4 5 6 7 8 9 10 11 12 1 2 2 2 2 2 2 2 2 2 2 - 1 2 3 4 5 7 8 8 8 - - - - - - - - - - - - - 1 0 1 2 3 3 3 2 1 0 1 2 Aluminum Silicone Phosphorus Sulphur Chlorine Argon Al Si S Cl Ar 13 14 15 16 17 18 13 14 15 16 17 17 18 14 16 16 18 22 13 14 15 16 17 18 2 2 2 2 2 2 8 8 8 8 8 3 4 5 6 7 8 - - - - - - - - 3 4 3.5 2 1 0 Solution: a) To find a mass amount of oxygen: Number of protons: 8 Number of neutrons - 8 Atomic number - 8 Atomic mass number - 8 Atomic mass number - Number of protons, mass oxygen Number 16 (b) To find a mass amount of sulfur: Number of protons - 16 Number of neutrons - 16 Atomic number - 16 Atomic mass number - Number of protons - number of neutrons - 16 and 16 - 32 Exercise-4.6 Page : 53 1. For the H, D and T symbols, tabulate three subatomic particles found in each of them. Solution: The following table shows subatomic particles of hydrogen (H), deuterium (D) and tritium (T). Isotope Symbol Mass no. Atomic no. No. Electrons No. Proton No. Neutron Hydrogen H 1 1 1 1 1 0 Deuterium D 2 1 1 1 1 Tritium T 3 1 1 1 2 2. Write the electronic configuration of any pair of isotopes and isobara. Solution: (a) Isotopes: Isotopes are atoms that have the same number of protons, but the number of neutrons is different. This leads to a change in the mass number too. Example: Carbon molecule exists as 6C12 and 6C14, but when their Configuration is noticed, both have K-2; L-4 (b) Isobars: Isobars are atoms that have the same mass number but differ in atomic number. The electronic configuration of the isobard pair is as follows: Electronic configuration 20Ca40 - K-2; L-8; M-8; N- 2 Electronic configuration 18Ar40 - K-2; L-8; M-8 Exercise Page: 54 1. Compare the properties of electrons, protons and neutrons. Solution: Real Estate Electrons Protons Neutrons Charge Negatively Charged Positively Charged No Charge. The location located outside the nucleus located inside the nucleus of the Weight Mass atom is negligible 1am 1am 0.m.u Affinity Attracted to positively charged Attracted to negatively charged Do not attract to any charged particle 2. What are the limitations of J.J. Thomson's atom model? Solution: Below are the limitations of the model of the atom J.J. Thomson. The model could not explain the result of the alpha particle scattering conducted by Rutherford. The model has not been able to depict why most of these alpha particles pass through the gold foil, while some are distracted through small and large angles, while some others rebound completely, returning to their path. It did not provide any experimental evidence and was created on the basis of imagination. 3. What are the limitations of the Rutherford atom model? Solution: Below are the limitations of the Rutherford atom model: There is no expected stability in the electron revolution in the circular orbit Charged particles emit energy at acceleration, causing rotating electrons to lose energy and fall into the nucleus so atoms must be very unstable. Matter would not exist in their known form, which is clearly an assumption, since atoms are very stable. 4. Describe the model of the Bora atom. Solution: The atom holds the core in the center. Negatively charged electrons rotate around the nucleus. The atoms in it contain different orbits of electrons. Electrons do not emit energy when they are in their orbits. Different orbits are called K, L, M, N. Numbers, used to indicate their No. 1, 2, 3, 4 5. Compare all the proposed atom models given in this chapter. Solution: Thomson Rutherford Bohr - Sphere positively charged :Electrons are negatively charged and scattered all over the inner part of the sphere. Positively charged and negatively charged - the net charge in the atom is zero. The core is in the center and positively charged, holding the entire mass. Electrons are negatively charged rotating in a clearly defined way Compared to the nucleus, the size of the atom is very large. The nucleus is present in the center and positively charged, electrons are negatively charged, rotate around, but do not emit energy. Different orbits are marked K, L, M, H 6. Thomson Atom Model 7. Rutherford Atom Model 8. The Bora atom model will summarize the rules for writing the distribution of electrons in different shells for the first eighteen elements. Solution: The maximum number of electrons that can be placed in the shell is given according to the formula: 2n2 , where n' 1, 2, 3... Maximum number of electrons in different shells: K shell - n-1; 2n2 and 2 (1)2 and 2 L shell - n 2n2 - 2 (2)2 - 8 M shell - n-3; 2n2 No 2 (3)2 and 18 N shell-n-4; 2n2 No. 2(4)2 and 32 Outer Orbit can be placed with 8 electrons maximum. Electrons are not accepted if the inner shells are filled, which are filled step by step, hence the highest element has K-2; L-8 ; M-8 electron distribution. 9. Identify valence by taking examples of silicon and oxygen. Solution: A certain combination of the atom capacity of each element, in which electrons are lost, acquired or divided to make an octet of electrons present in the outer shell, is defined as valence. To measure valence, we can figure out the number of electrons that are needed to complete the shell in which it is contained or the loss of excess electrons if present as soon as the filling is complete. Example : To find silicon valence: Atomic amount of silicon is 14 The number of electrons equal to the number of protons in silicon i.e., 14 Distribution of electrons in the silicon atom K - 2, L - 8, M - 4 Therefore, from the distribution of silicon clearly shows that to fill the shell M 4 electrons are needed. Thus, its valence is 8-4'4. To find the valence of oxygen: the atomic amount of oxygen is 8 Number of electrons equal to the number of protons in oxygen i.e., 8 Distribution of electrons in the oxygen atom K - 2, L - 6 Therefore, from the distribution of oxygen it is clear that to fill the shell M requires another 6 electrons. Thus, its valence is 8-6'2. 10. Explain by examples (i) Atomic number, (ii) Mass number, (iii) Isotopes and (iv) Isobary. Give any two uses of isotopes. Solution: (i) The number of positively charged protons present in the nucleus of an atom is defined as an atomic number and is indicated by B. Example: Hydrogen has one proton in the nucleus, hence its atomic number is one. (ii) The total number of protons and neutrons present in the nucleus of an atom is known as a mass number. Designated A. 20Ca40 . The mass number is 40. Atomic number 20. (iii) Atoms that have the same number of protons but different numbers of neutrons are called isotopes. Thus, the mass number varies. Example: The simplest example is a carbon molecule that exists as 6C12 and 6C14 (iv) Isobars: Isobars are atoms that have the same amount of mass but differ in atomic number. Examples, 20Ca40and 18Ar40 isotopes: Isotope of iodine atom used to treat treatment and a disease lacking in iodine. The isotope of cobalt is used in the treatment of cancer. Fuel for nuclear reactors is made from isotopes of the uranium atom. 11. Naz completely filled the shells K and L. Explain. Solution: Atomic sodium is 11. It has 11 electrons in its orbits, in which the number of protons equals the number of electrons. Thus, its electronic configuration K-2; L-8 ; M-1; One electron in the M shell is lost and it gets a positive charge, since it has another proton than electrons, and gets a positive charge, Naz . New K-1 electronic configuration; L-8, which is a filled state. Therefore, it is very difficult to exclude an electron from a filled state, as it is very stable. 12. If the bromine atom is available in the form of, say, two isotopes 35Br79 (49.7%) and 35Br81 (50.3%), calculate the average atomic mass of the bromine atom. Solution: Atomic masses of two isotopic atoms 79 (49.7%) Thus, the total weight (79 - 49.7 / 100) - 81 - 50.3 / 100) - 39,263 - 40,743 - 80,006 u 13. The average atomic mass of element X is 16.2 u. What are the percentages of isotopes 8X16 and 8X18 in the sample? Solution: Let the percentage of 8X16 be as well, and 8X18 - 100-a. According to the data, 16.2u 16 a / 100 - 1800 - 2 a 90% the percentage of isotopes in the 8X16 sample is 90% and 8X18 is 100-100-90-10% 14. If there was No. 3, what would be the valence of the element? Also, name the item. Solution: Considering: Atomic Number, No. 3 Electronic Configuration of K-2; L-1, therefore, its valence No. 1 Element with atomic number 3 lithium. 15. The nuclei of the two atomic species X and Y are given as under X Y Protons No. 6 6 neutrons No. 6 8 Give the mass number X and Y. What is the connection between the two species? Solution: Mass X: Protons and Neutrons - 6'6 - 12 Mass Number Y: Protons and Neutrons - 6'8 and 14 They are the same element as their atomic numbers. They are isotopes because they differ in the number of neutrons and therefore their mass. For the following statements, write T for true and F for false. (a) J.J. Thomson suggested that the nucleus of an atom contains only the nucleus. (b) The neutron is formed by an electron and a proton uniting together. That's why it's neutral. (c) The electron mass is about 1/2000 times the mass of a proton. (d) Iodine isotope is used to make iodine tincture, which is used as a medicine. Decision: (a) The statement is false (b) The statement is false (c) Statement of truth (d) Statement is false 17. Put a tick (I) against the right choice and cross (x) against the wrong choice in matters 15, 16 and 17. Rutherford's Alpha - Particle Scattering was responsible for the discovery (b) Of the Atomic Nucleus (b) Electron (c) Proton (d) Neutron Solution: a) The atomic nucleus of the element isotopes have (a) The same physical properties (b) Different chemical properties (c) Different number of neutrons (d) Different atomic numbers. Solution: (c) Different number of neutrons 18. Number of valent electrons in Cl-ion: a) 16 (b) 8 (c) 17 (d) 18 Solution: b) 8 Electronic Distribution Cl is K-2, L-8, M-7. Valent electrons 7, hence, chlorine receives one electron to form Cl-. Thus, its valence is 8. 19. Which of the following is the correct electronic sodium configuration? a) 2, 8 (b) 8, 2, 1 (c) 2, 1, 8 (d) 2, 8, 1 Solution: (d) 2, 8, 1 The next table. Atomic Number Number Number of Neutrons Number of Protons Number of Electrons Atomic Species Name 9 16 - - - - - - - - - - - - 32 2 2 10 - - - 0 - - - - - - - - - - Solution: The following table shows the missing data: Atomic number (i) Number of protons Mass number - - - - - - - - Number of neutrons - Atomic number (or) Mass number (A) - Number of neutrons Atomic number Number of neutrons Number of neutrons Number of protons Number of electrons Atomic species Name 9 16 12 1 1 19 32 24 2 1 10 16 12 1 0 9 16 12 1 1 9 16 12 1 0 Fluoride Of Magnesium Sulphur De Hydrogen NCERT Solutions for Class 9 Science Chapter 4 - Structure of the Atom NCERT Class 9 Science Chapter 4 - The structure of the atom is classified according to Block I - Matter - His nature and behavior, which fundamentally deals with the physical nature of matter and what is the particle that makes up for the subject. The entire unit of matter is 23 marks, of which the structure of the atomic chapter is allocated 10 marks. In order to score maximum points, students practice NCERT solutions. This

chapter has good weight. Careful knowledge of all the concepts covered in this chapter will help you reach up to 10 marks from this chapter alone. About 2 questions on 5 marks each appear in the exam from this chapter and are expected to appear next year too. List of subtopics covered in Class 9 Science Chapter 4 - Atom Structure: Number of subtopic 4.1 Charged particles in matter 4.2 Atom structure 4.2.1 Model Thomson Atom 4.2 2.1 4.2.2 Model Rutherford Atom 4.2.3 Bohr Model Atom 4.2.4 Neutrons 4.3 How are electrons distributed in different orbits (shells)? 4.4 Valencia 4.5 Atomic Number and Mass Number 4.5.1 Atomic Number 4.5.2 Mass Number 4.6 Isotopes 4.6.1 Isobare Exercise List in Class 9 Science Chapter 4 Number 4 Number 4 Charged Particles in Matter 2 Issue (2 short) Number 4.2 - Atom Structure 4 Issue (4 short) Number 4.2.4 - Neutrons 2 Issue (2 short) Number 4.3 - How Electrons indifferent orbits (shells)? 2 Issue (1 long, 1 short) Number 4.4 - Valencia 1 Issue (1 long) Number 4.5 - Atomic number and mass number 2 Issue (2 long) Number 4.6 - Isotopes 2 Issue (1 long, 1 Short) Exercise Solutions - 19 Issue (6 Long, 9 Short, 4 MC) NCERT Solutions for Class 9 Science Chapter 4 - Structure of the Atom In This Chapter, we get enlightened about the discovery of electrons and protons that is credited to J.J. Thomson and E. Goldstein accordingly. According to J.J.Thomson's theory, electrons are implanted into a positive sphere. The discovery of the atomic nucleus was directed by Rutherford's experiment in the scattering of alpha particles. We also learn about how the Neil Bohr model was successful when he explained how electrons are distributed in different orbits around the nucleus. This chapter also briefly refers to the discovery of neutrons in the atom proposed by J.Chadwick, hence the conclusion that there are three subatomic particles, i.e. protons, neutrons and electrons. It also sheds light on concepts such as valence, atomic number and mass number, which are necessary to identify elements and their behavioral properties. In general, it helps us to respond to the basic concepts of what distinguishes the atom from the atoms of other elements, the indivisibility of the concept of atoms, the representation of elements through mass and atomic mass, as well as the basic components of the atom. The key features of NCERT Solutions for 9th Grade Science Chapter 4 - Atom NCERT Structure Solutions allow students to prepare for the CBSE Grade 9 exam without stress. Calculations and electronic configurations were explained in detail in the decision. The diagrams have been used where necessary to be able to learn visually. Detailed figures related to the search for valence elements. Comparison of questions involves using tables to help you learn and understand better. Pointers have been used in solutions to remember at first sight. Positively charged radiations are the rays of the channel. This discovery was decisive in the discovery of another subatomic particle that was positively charged - a proton. Because the proton is a positively charged particle and the electron is a negatively charged particle, the net charge becomes neutral because both particles neutralize each other. According to Rutherford's atom model, positively charged protons are those present in the atom. In the particle scattering experiment, when any other metal foil is used instead of gold, the observation will remain the same. This is because the structure of the atom, if viewed individually remains the same. Same. atomic structure ncert solutions. atomic structure ncert notes. atomic structure ncert solutions pdf. atomic structure ncert exemplar. atomic structure ncert class 9. atomic structure ncert exemplar pdf. atomic structure ncert solutions class 11. class 11th atomic structure ncert solutions