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Chapter 4 science class 9 pdf notes grade

Since they have a mass of 4 u, the fast - moving α -particles have a considerable amount of energy.It was expected that α - particles would be deflected by the sub - atomic particles in the gold atoms. Since the α - particles were much heavier than the protons, he did not expect to see large deflections. α - particle scattering experiment unexpected resultsMost of the fast moving particles passed straight through the gold foil.Some of the α - particles were deflected by the foil by small angles.Surprisingly one out of every 12000 particles appeared to rebound.In the words of Rutherford, "This result was almost as incredible as if you fire a 15 - inch shell at a piece of tissue paper and it comes back and hits you".Rutherford concluded from the α - particle scattering experiment thatMost of the space inside the atom is empty because most of the α - particles passed through the gold foil without getting deflected.Very few particles were deflected from their path, indicating that the positive charge of the atom occupies very little space.A very small fraction of α -particles were deflected by 180°, indicating that all the positive charge and mass of the gold atom were concentrated in a very small volume within the atom.From the data he also calculated that the radius of the nucleus is about 105 times less than the radius of the atom.Rutherford experiment of nuclear model of an atom, which had the following features:There is a positively charged center in an atom called the nucleus.Nearly all the mass of an atom resides in the nucleus.The electrons revolve around the nucleus in circular paths.The size of the nucleus is very small as compared to the size of the atom.Drawbacks of Rutherford's model of the atomThe revolution of the electron in a circular orbit is not expected to be stable.Any particle in a circular orbit would undergo acceleration.During acceleration, charged particles would radiate energy.The revolving electron would lose energy and finally fall into the nucleus.If this were so, the atom should be highly unstable and hence matter would not exist in the form that. This is called octet rule.Types of ValencyThe combining atoms of the elements try to acquire the nearest inert gas stable configuration mainly in two ways:By loss or gain (transfer) of electrons between the combining atoms (electrovalency).Atomic Number and Mass NumberATOMIC NUMBERIt is the number of protons of an atom. It is denoted by Z.All atoms of an element have the same atomic number, Z.The atomic number is defined as the total number of protons present in the nucleus of an atom.MASS NUMBERMass of an atom is practically due to protons and neutrons alone.These are present in the nucleus of an atom.Protons and neutrons are also called nucleons.The mass of an atom resides in its nucleus.For example, mass of carbon is 12 u because it has 6 protons and 6 neutrons, $6\text{ u} + 6\text{ u} = 12\text{ u}$.The mass number is defined as the sum of the total number of protons and neutrons present in the nucleus of an atom.IsotopesIsotopes are defined as the atoms of the same elements, having the same atomic number but different mass numbers.Three isotopes of hydrogen atom, namely protium, deuterium and tritium.The chemical properties of isotopes are similar but their physical properties are different.If an element has no isotopes, then the mass of its atom would be the same as the sum of protons and neutrons in it.ApplicationsAn isotope of uranium is used as a fuel in nuclear reactors.An isotope of cobalt is used in the treatment of cancer.An isotope of iodine is used in the treatment of goitre.Isobars Atoms of different elements with different atomic numbers.which have the same mass number, are known as isobars.Benefits of NCERT Class 9 Science Chapter 4 Notes Structure Of The Atom NCERT Class 9 Science Chapter 4 Notes Structure Of The Atom contains extremely important points, and for each chapter, each concept has been simplified to make it easier to remember and increase your chances of achieving excellent exam results. To get good results in the exam, it is important to overcome your weaknesses.Most of the questions in the exam are formulated in a similar way to NCERT textbooks. Atoms are quite stable.BOHR'S MODEL OF ATOMNeils Bohr put forward the following postulates about the model of an atom:Only certain special orbits known as discrete orbits of electrons, are allowed inside the atom. While revolving in discrete orbits the electrons do not radiate energy.These orbits or shells are called energy levels, Energy levels.These orbits or shells are represented by the letters K, L, M, N,... or the numbers, $n = 1, 2, 3, 4, \dots$.NEUTRONSIn 1932, J. It's most effective natural to get stuck withinside the exercises while solving them so that you could assist students rating better marks, we have provided grade by grade NCERT answers for all exercises of Class 9 Science Structure Of The Atom so you can be searching for assist from them. These elements are chemically reactive.Valency and Valence ElectronsValency is defined as the number of valence electrons of an atom (element) which actually take part in the chemical combination or bond formation with other element.The valency of an element is equal to the number of valence electrons if their number is 4 or less . For example, Na (2, 8, 1) has 1 valence electron and therefore, valency of sodium is 1. Find all NCERT Notes for Class nine Science Structure Of The Atom below and prepare for your tests easily.Chapter 4 : Structure Of The AtomA major challenge before the scientists at the end of the 19th century was to reveal the structure of the atom as well as to explain its important properties.One of the first indications that atoms are not indivisible , comes from studying static electricity and the condition under which electricity is conducted by different substances.Charged particles in matterMany scientists contributed in revealing the presence of charged particles in an atom. It was known by 1900 that the atom was not a simple , indivisible particle but contained at least one sub - atomic particleThe electron identified by J.J. Thomson. Even before the electron was identified, E. In some of State Boards and CBSE schools, students are taught thru NCERT books. were like currants (dry fruits) in a spherical Christmas pudding.Thomson proposed that:An atom consists of a positively charged sphere and the electrons are embedded in it.The negative and positive charges are equal in magnitude. So , the atom as a whole is electrically neutral.RUTHERFORD'S MODEL OF AN ATOMErnest Rutherford was interested in knowing how the electrons are arranged within an atom. Rutherford designed an experiment for this.In this experiment:He selected a gold foil because he wanted as thin a layer as possible. This gold foil was about 1000 atoms thick. α - particles are doubly - charged helium ions. Provide complete teaching materials, including resolved and unresolved tasks.It is important to clear all your doubts before the exam with your teachers or Alex (an AI study Bot). When you read or study a chapter, write down algorithm formulas, theorems, etc., and review them quickly before the exam.Practice an ample number of question papers to make your concepts stronger. Take rest and a proper meal. Don't stress too much. Why opt for cbsestudyguru NCERT Notes for Class 9 ? cbsestudyguru provide NCERT Notes for all subjects at your fingertips.These Notes are designed by subject matter experts and provide solutions to every NCERT textbook questions. cbsestudyguru especially focuses on making learning interactive, effective and for all classes.We provide free NCERT Notes for class 9 and all other classes. Chadwick discovered another sub atomic particle which had no charge and a mass nearly equal to that of a proton.Neutrons are present in the nucleus of all atoms , except hydrogen.A neutron is represented as 'n'.The sum of the masses of protons and neutrons present in the nucleusHow are Electrons Distributed in Different Orbits (Shells)?The distribution of electrons into different orbits of an atom was suggested by Bohr and Bury.Rules are followed for writing the number of electrons in different energy levels or shells:The maximum number of electrons present in a shell is given by the formula $2n^2$. NCERT Class 9 Science Chapter 4 Notes Structure Of The Atom on this step-by-step answer guide . Therefore, students should review the solutions in each chapter in order to better understand the topic.It is free of cost.Tips & Strategies for Class 9 Exam PreparationPlan your course and syllabus and make time for revisionPlease refer to the NCERT solution available on the cbsestudyguru website to clarify your concepts every time you prepare for the exam.Use the cbsestudyguru learning app to start learning to successfully pass the exam. Students have to solve those exercises carefully as questions withinside the very last exams are requested from those so these exercises at once have an impact on students' final score, where ' n ' is the orbit.first orbit or K - shell will be = $2 \times 1^2 = 2$ second orbit or L - shell will be = $2 \times 2^2 = 8$ third orbit or M - shell will be = $2 \times 3^2 = 18$ fourth orbit or N - shell will be = $2 \times 4^2 = 32$, and so on. The maximum number of electrons that can be accommodated in the outermost orbit is 8. Electrons are not accommodated in a given shell, unless the inner shells are filled.ValencyKossel and Lewis and Langmuir studied the electronic configuration of different elements.It is observed that each element has a definite electronic configuration and normally, the electrons present in the outermost shell take part in chemical reactions of that element.The outermost shell of an atom is known as the valence shell and the electrons present in the outermost shell are known as valence electrons.Valence Electrons and Chemical Properties of the ElementsChemical properties of the elements mainly depend on the number of valence electrons and not the total number of electrons present in an atom. An element is chemically inert if it has 8 electrons in its outermost shell. Except helium , which has 2 electrons in its outermost shell , all other noble gases have 8 electrons (octet) in their valence shell and hence , all noble gases are highly unreactive and rather chemically inert.Elements with 1 electron in their valence shell, for example, lithium (2, 1), sodium (2, 8, 1), etc, are very reactive.Elements with 7 electrons in their valence shell, for example, fluorine (2, 7), chlorine (2, 8, 7) etc, are also very reactive.Elements having same number of valence electrons show similar chemical properties. For example, Li (2,1), Na (2, 8, 1) and K (2, 8, 8, 1) have one electron in their outermost shell. These elements show similar chemical properties. As the chapter comes to an end, students are requested few questions in an exercising to evaluate their knowledge of the chapter. Goldstein in 1886 discovered the presence of new radiations in a gas discharge and called them canal rays. This sub-atomic particle had a charge, equal in magnitude but opposite in sign to that of the electron.It was given the name of proton. An electron is represented as 'e-' and a proton as 'p+'.The mass of a proton is taken as one unit and its charge as plus one.The mass of an electron is considered to be negligible and its charge is minus one.The Structure of an AtomThe discovery of two fundamental particles (electrons and protons) inside the atom, led to the failure of Dalton's atomic theory.J.J. Thomson was the first one to propose a model for the structure of an atom.THOMSON'S MODEL OF AN ATOMThomson proposed the model of an atom to be similar to that of a Christmas pudding.The electrons , in a sphere of positive charge . Therefore, reactive atoms (or elements) undergo chemical combination or bond formation in order to acquire octet configuration in their valence shell. Exam Preparation References Here are some tips on how these solutions can help you prepare for the exam.This helps students solve many of the problems in each chapter and encourages them to make their concepts more meaningful.NCERT Class 9 Science Chapter 4 Notes Structure Of The Atom encourage you to update your knowledge and refine your concepts so that you can get good results in the exam.These notes are the best exam materials, allowing you to learn more about your week and your strengths. For example, carbon nitrogen, oxygen and fluorine have 4, 5, 6 and 7 valence electrons respectively. Similarly, fluorine, chlorine, bromine, etc., which are collectively called halogens, have similar chemical properties.Elements having less than 4 electrons in their valence shell are normally metals and are reactive. Students regularly want guidance dealing with those NCERT Notes. Hydrogen and helium having 1 and 2 valence electrons respectively are exceptions.Elements having 4, 5, 6 or 7 electrons in their outermost shell are normally nonmetals. Similarly, carbon (2, 4) shows a valency of 4.Electronic Concept of ValencyIt is a well - known fact that noble gases like Helium (He) Neon (Ne) . Argon (Ar) . Krypton (Kr) and Xenon Xe are rather chemically inert . Except helium , which has 2 electrons in its valence shell , atoms of all noble gases have 8 electrons (octet) in their outermost shell or the valence shell This shows that the octet configuration is very stableOctet Rule: Every system in nature tries to have the state of maximum stability.

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