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Atoms and molecules class 9 pdf notes

The matter that surrounds us is made up of tiny particles. The class 9 syllabus for science entails a very interesting chapter that enlightens us with the actual phenomenon behind the composition of different substances. In addition to that, you will learn about Dalton's atomic theory, atomic and molecular masses, ions, mole concept and many other interesting topics. Here are the complete study notes for Class 9 Atoms and Molecules to make this chapter easy to study and remember for you! Examples of Chemistry in Everyday Life Laws of Chemical Combination The chapter begins with a thorough explanation of the two laws of chemical combination. Great minds like Kannad (600 BC), Democritus, and Leucippus (400 BC), as well as Antoine Lavoisier and John Dalton, made some observations, based upon which these laws have been devised. After a detailed and logical analysis, they all came to some conclusions regarding the formation of compounds and laid down the below-mentioned laws- Law of Conservation of MassAccording to this law, for a general chemical reaction, there is no loss or gain in the total mass of substances. It means that, in a chemical reaction, there is no change in the total mass as the mass of the product is always equal to the mass of the reactant. Law of Constant or Definite Proportion This law explains that all pure elements of the same compound contain the same elements in the same proportion of weight. In simpler words, every element combines with another in a definite or constant ratio, i.e., depending on their atomic masses. Check Out Study Notes for Class 9: Work, Energy and Power Dalton's Atomic Theory The famous chemist, John Dalton, carried out a random experiment which later on became the famous Atomic Theory. He analysed it critically and then presented his insightful observations in the form of postulates of atomic theory. Dalton's postulates regarding the atomic theory as per class 9 atoms and molecules are: Atoms make up all the matter in this world Atoms of a given element have exactly the same chemical properties and mass Atoms are indivisible particles which can neither be created nor destroyed Atoms of different elements have varied chemical properties and mass Atoms combine in a ratio of small natural numbers to form compounds. A given compound will always have determined kinds and number of atoms Atoms Now we will explore the most vital topic of this chapter. The smallest and the tiniest unit that can be a part of a chemical reaction is known as an Atom. Atoms tend to have some general properties which they showcase, let us have a look at them- Atomic Size Atoms are invisible to the naked eye. Their shape is spherical and is not visible by an ordinary microscope. The diameter of an atom is about 1×10^{-10} m. Even on the tip of a pencil, there are thousands, if not millions of atoms. Atomic Mass Every element has a set atomic mass. This was a direct postulate from Dalton's Theory on atoms. Determining the mass of such a tiny particle was a daunting task. Hence, this is where the concept of Relative Atomic Mass comes in. What is Motion in a Straight Line? Symbols for Elements As the discovery of elements went on for years and years, every element was given a particular symbol either based on its initials or on the name of the scientist who discovered it. Tabulated below are some important elements from the class 9 atoms and molecules chapter. Molecule The very next important topic of this chapter is of molecules. A molecule is the smallest particle of matter (element or compound) which can exist in a free state. Like atoms, molecules of any given substance are all similar. Consequently, molecules of different substances are different. Atomicity is the number of atoms contained in a molecule of a substance (element or compound). Based on atomicity, the types of molecules are: Monoatomic Molecules Diatomic Molecules Triatomic Molecules Tetratomic Molecules Polyatomic Molecules What is the Difference Between Acid and Base? Ions The class 9 atoms and molecules chapter include another integral topic called Ions. The compounds formed by charged particles are called ions. Ions carrying positive charges are called Cations, and the ones with negative charges are called Anions. For Example: NaCl is an ionic compound. That means that it is made up of Sodium ion (Na+) and Chlorine ion (Cl-). Rules for writing Chemical Formulae Writing a chemical formula has an intricate science which runs behind the process. Till now, you must have learnt them without knowing the actual reason for their placement. But in the class 9 atoms and molecules, you will also get to know that chemical formula denotes the ratio of elements used to form the given compound. The correct formula can be determined if we know the respective valencies of the given elements. Before we go on to exploring the rules, the combining power of an element or ion as per which it can react is called Valency. The higher the valency, the more the number of atoms or ions it can accumulate. Mentioned below are some common valencies: The formula of a compound is given by writing, side by side, the symbols of the constituent elements. The symbol of more a metallic element is written first in the formula, for example, HCl, NaCl, CaCO3, etc. Subscripts indicate the number of atoms in each of the constituent elements present. For example, in H2O, there are 2 Hydrogen and 1 Oxygen atom. Furthermore, the simple binary compounds are made by crisscrossing the valencies present in the molecules of a compound. Mole Concept One of the most important concepts of class 9 atoms and molecules is the explanation of the mole concept. A mole of atoms is a collection of atoms whose total mass is the number of grams equal to the atomic mass. A mole (mol) is defined as the amount of substance that contains as many atoms, molecules, ions, electrons, etc., as there are atoms in exactly 12 g of carbon 12 (12C). A mole of a substance represents 6.022×10^{23} particles of the substance. Number of Moles = (mass of the given element in grams) ÷ (gram-atomic mass of the element) Class 9 Atoms and Molecules: Important Questions Some conceptual questions to clarify any doubts about atoms and molecules class 9 are: What is the mass of 5 mol of Ammonia? Explain 'relative atomic mass.' Write the correct chemical formula of (i) Sodium Carbonate (ii) Magnesium Oxide. These were some essential points for class 9 atoms and molecules. Get in touch with our experts at Leverage Edu as they will help you have a clear picture of your upcoming future. [Total: 11 Average: 4.8] CBSE Revision Notes Class 9 Science Chapter 3 Atoms and Molecules CBSE Revision Notes Class 9 Science Chapter 3 Atoms and Molecules are provided to help the students understand and revise the concepts right from the beginning. The concepts taught in Class 9 are important to be understood as these concepts are continued in upcoming classes. To score good marks in Class 9 Science examination, it is advised to solve questions provided in the Revision Notes Class 9 Science Chapter 3. These revision notes for Class 9 Science help the students to revise all the concepts in a better way. Swiflearn provides Revision Notes and keynotes chapter wise for the CBSE board exam in an easy-to-understand, free downloadable PDF format so students can use it for their studies and score better in their board exams. The CBSE Class 9 Revision Notes are made for the main subjects of Science and Science. These core subjects are very critical as they are the stepping stones and plays a crucial role in student's future. They might be tricky for students. The CBSE Class 9 Revision Notes for each chapter will enable them to have an expert studying pattern with which they can enjoy learning the subject and perform better in the exams. CBSE Class 9 Science Revision Notes are designed keeping in my mind the exam pattern and syllabus of NCERT 2020-21. Students can download the PDF for free and practice the questions to score well in the coming exams. CBSE Revision Notes Class 9 Science Chapter 3 Atoms and Molecules The Universe is made up of atoms, which contain protons (positively charged particles), neutrons (particles with no charge), and electrons (negatively charged particles). Molecules forms when two or more atoms bond together. Atoms:- They are the basic building blocks of ordinary matter. Atoms join together to form molecules, which in turn form most of the objects around us. Dalton's atomic theory:- According to Dalton's atomic theory, all matter, whether an element, a compound or a mixture is composed of small particles called atoms. Molecules:- Molecules are the smallest particle of a substance that retains the chemical and physical properties of that substance. Example:- two atoms of hydrogen and one atom of oxygen react to form one molecule of water. Laws of chemical combination Law of conservation of mass According to the law of conservation of mass, mass can neither be created nor destroyed in a chemical reaction. It can only change its form from one form to another. Law of constant proportion The law of constant proportion is also known as the law of Definite proportions. It states that in a chemical substance the constituent elements are always present in definite proportion by mass. Dalton's Atomic theory According to this theory element a compound or a mixture consist of small particles called atoms. The theory was further explained as . Matters are made up of tiny particles called atom. Atoms are indivisible particles and cannot be created or destroyed. Atoms of a particular element r identical in mass and chemical property. Combine in the ratio of small whole numbers to form compound. Relative number and kind of atoms R constant in a given compound. Atom The smallest particle of matter is an atom. Atoms are the building blocks of matter. Millions of atoms stacked together to form a thin piece of paper. The radius of atoms is measured in NM. Since the atom size is very small we might think that is insignificant, but they are there and also affecting whatever we do. Modern day symbols of atom of different elements: Dalton designed specific symbols for each element in a very specific sense. Each symbol was meant for a particular element also for a definite quantity of that element that is a single atom. Berzelius suggested that the symbol of element can be made from one or two letters of the name of the elements. nowadays IUPAC (International Union of Pure and Applied Chemistry) is an international scientific organisation which approves names for elements symbols and units. For example: Hydrogen as H, aluminium as Al and Cobalt as Co. Element Symbol Element Symbol Aluminium Al Copper Cu Nitrogen N Argon Ar Fluorine F Oxygen O Barium Ba Gold Au Potassium K Boron B Hydrogen H Silicon Si Bromine Br Iodine I Silver Ag Calcium Ca Iron Fe Sodium Na Carbon C Lead Pb Sulphur S Chlorine Cl Magnesium Mg Uranium U Cobalt Co Neon Ne Zinc Zn Atomic mass Dalton told in his atomic theory about the atomic mass, each element has a characteristic atomic mass. Those days determining the mass of an individual atom was relatively difficult so atomic masses were determined by using the law of chemical combination and the compounds formed. Similarly, relative atomic mass of the atom of an element is defined as the average mass of the atom. Example: 3 grams of carbon combines with 4 grams of oxygen to form CO. Element Atomic mass Hydrogen 1 Carbon 12 Nitrogen 14 Oxygen 16 Sodium 23 Magnesium 24 Sulphur 32 Chlorine 35.5 Calcium 40 Atoms Existence Atoms of different element cannot exist independently. A number of atoms combines together to form molecules or ions. These molecules or ions aggregates together to form matter which we can see, feel or touch. Molecules of elements Molecules of an element are formed by the accumulation of same type of atoms. molecules of elements like Argon helium are made up of only one atom of that element. Molecules can be monoatomic, diatomic, polyatomic and so on. The total number of atoms constituting a molecule is known as its atomicity. Non-Metal Atomicity Argon Monoatomic Helium Monoatomic Oxygen Diatomic Hydrogen Diatomic Nitrogen Diatomic Chlorine Diatomic Phosphorus Tetra-atomic Sulphur Poly-atomic Molecules of compounds When atoms of different elements join together in definite proportion they form the molecules of a compound. As water molecule consists of hydrogen and oxygen in the ratio of 1:8. Ions Compound composed of metals and nonmetals contains charged species known as ions. Ions may consist of a single charged atom or a group of atoms that have a net charge on them. A negatively charged ion is called as "anion" and a positively charged ion is called as "cation". In the case of (Sodium Chloride) NaCl, sodium is a positively charged Ion and chloride is a negatively charged ion. Writing chemical formulae The symbolic representation of the composition of a compound is the chemical formula of that particular compound. The combining power of an element is known as its valency. With the help of valency, we can understand that how the atom of a particular element will combine with the atoms of another element to form a compound. Formula of simple compounds Simplest compound made up of only two different elements are called as binary compounds. For writing the chemical formula of a compound we write the constituent elements and their valencies and then crossovering the valency of the combining atoms helps forming the compound. Molecular mass Molecular mass of a substance is the sum of the atomic masses of all the atoms in a molecule of the substance. The relative mass of a molecule is expressed as atomic mass units(u). Formula unit mass Formula unit mass of a substance is the sum of the atomic masses of all the atoms in a formula unit of a compound. This calculation is similar to that of the molecular mass but the only difference is that the substance constitutes of ion particles. Mole concept Atoms and molecules are too small to count so the numbers are expressed in terms of Avogadro number. 1 mole is the number equal to Avogadro's number. Mole can be defined as a unit which represents 6.023×10^{23} . mass of one mole of a substance is called its molar mass. Example One mole of carbon atom is equals to 12 grams of carbon atom equals to 6.023×10^{23} atoms of carbon. One mole of hydrogen atom is equals to 1 gram of hydrogen atom which is equals to 6.022×10^{23} atoms of hydrogen. Numerical on Mole concept atoms and molecules class 9 notes study rankers. atoms and molecules class 9 notes in hindi. atoms and molecules class 9 notes ncert. atoms and molecules class 9 notes vedantu. atoms and molecules class 9 notes ppt. atoms and molecules class 9 notes questions answers. atoms and molecules class 9 notes in hindi pdf. atoms and molecules class 9 notes kseeb

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