# Modelo atomico de dalton pdf

In the late eighteenth and early nineteenth centuries, the weight laws of chemistry were established to help develop the first atomic models of the issue. A large number of chemical elements, which are known to be combined to form compounds, have already been identified. The task facing the chemists was to know the proportion of each of the compounds' atoms and then assign it a chemical formula that would identify it. Chemists were aware of enough synthesis and analysis techniques to determine the percentage of the elements that form the compound. For example, they knew full well that 100 grams of calcium oxide contained 28.6 grams of oxygen and 71.4 grams of calcium. If they knew the mass of these elements, they would calculate the proportion of each of them in the composition, thereby obtaining their own formula. But only knowing their formula, they could determine the ratio of atoms, and with it it could be estimated the corresponding atomic masses. That is, it entered a vicious circle, because chemists could not determine the formula because they did not know the atomic masses, and could not know the atomic masses, because they did not know the formula. Therefore, the key point is the need to find the atomic masses of each of the chemical elements. Obviously, the mass of the atom is tiny, so there was an idea to determine the mass of atoms compared to the mass of the lightest known element, hydrogen, which was assigned a mass equal to one (known as a unit of atomic mass). The masses of atoms calculated in this way were called atomic scales. Thus, it was possible to determine the atomic scales of many elements, and with them the formulas of a large number of compounds were derived. Sometimes different proportions were found for the same compound, so the John Dalton Maximum Simplicity Rule (1766-1844) was used to ensure that, if in doubt, the connection formula would be the easiest of all possible. It was also useful when two elements, A and B, could form multiple compounds. In this case, the simplest connection will have an AB-type formula that will allow us to know the relationship between the atomic scales of these elements and, with them, you can identify the formulas of other simple combinations A and B (such as AB2, A2B...). However, this strategy has not always been a guarantee of success, as in the case of the water for which Dalton appropriated the HO formula, a mistake similar to the one he made with ammonia, to which he formulated as NH. Dalton presenting some elements and connections the experience of Joseph Louis Guy-Lusac (1778-1850), which led him to the state law of combined volumes (which says that the volumes of gases that react or occur in a chemical reaction are linked to each other by simple integrators), contradict the proposed Dalton atomic model. As an example: under the Gay Lussac act, the volume of nitrogen reacts with the volume of oxygen to give two volumes of nitric oxide, something Dalton categorically denied, because in his view, if atoms differ from each other, it cannot be that in equal volumes of different gases there are the same number of atoms, and that there are twice as many atoms in double volumes of different gases. That is, if nitrogen and oxygen atoms are different from each other, their size cannot be the same, and in order for them to react to a certain number of nitrogen atoms with the same number of oxygen atoms, different volumes of each of these gases will be required. The same will be true of the amount of nitrogen oxide produced, which cannot match the amount of nitrogen and oxygen. This posed a great dilemma, as Dalton developed a solid theoretical model that also explained the laws of weight, but the experiments conducted by Gay-Lussac were thorough and accurate. We had to find a way to adapt the atomic theory to the indisputable evidence. Joseph Louis Guy-Lusac (1778-1850) A new approach to this controversial issue was proposed in 1811 by Amadeo Avogadro (1776-1856), who developed a dynamic model to explain the nature and behavior of gases, the basic hypothesis was that the particles are in motion, maintaining long distances between them, so their size is very small compared to the total volume of the vessel containing them, and it can be assumed that equal volumes of different gases (under the same pressure and temperature conditions) contain the same number of molecules. In addition, it solves the problem of combined volumes, given that elementary gases (such as hydrogen, oxygen, nitrogen or chlorine) were not from atoms, but from diatomist molecules (two atoms). Thus, for example, the reaction between chlorine and hydrogen can be interpreted to form hydrogen chloride. Experimentally, chlorine was shown to react with a different amount of hydrogen to form two volumes of hydrogen chloride. Given that the number of particles is the same in equal volumes, the reaction can be interpreted as a hydrogen molecule reacting with a chlorine molecule produce two hydrogen chloride molecules. In order for this to make sense, it should be assumed that both hydrogen and chlorine molecules have two atoms each. This assumption can be confirmed later, so whenever these substances are involved in chemical reactions, they are presented as H2, O2, N2, Cl2, F2, Br2 or I2. Amadeo Avogadro (1776-1856) Avogadro's contribution had no effect at the time, but half a century later (in 1858) resurfaced thanks to Stanislao Cannitzaro (1826-1910), who used them to calculate the approximate atomic weight and, from them, to deduce precise atomic weights. Although the terms of atomic and molecular weight are widespread, this is more correct and is now recommended when it comes to atomic and molecular mass, as weight is a manifestation of mass when interacting with the gravitational field. This led to a practical exit into the vicious circle that we talked about at the beginning, and the chemists of that time began to know more and more precise atomic weights, by which it was possible to determine the relationship of atoms in molecules that could finally be represented by chemical formulas. The formulas represent the composition of the substance and consist of a set of letters (symbols of elements), with subscripts indicating the number of atoms that are part of the molecule. The first definition of the chemical element is associated with the great Antoine Laurent de Lavoisier (1743-1794), who is considered the father of modern chemistry (as he raised it in the category of scientific activity based on research). In his Elementary Chemistry Contract (1789), he does the classification of known elements (a total of 32, including light and calorie, the supposed cause of fire), understanding how such pure substances cannot be broken down into simpler ones. A few years later, the English scientist John Dalton finally established the atomic nature of matter, realizing that the atoms of the same element are always equal to each other and different from the atoms of other elements. At first glance, the differences between the elements were obvious: physical condition, color, brightness, smell, taste... There are even some guidelines for their identification based on their chemical behavior, but what distinguishes one element from another at the atomic level? With the discovery of weight laws, the first classifications of the elements were made according to their atomic masses and found that they could be sorted in such a way that they form groups of elements with similar properties. Thus, a periodic table of elements was released, which was improved and completed over time. It was possible. A number of scientists, such as Thomson, Rutherford or Chadwick, who in the late 19th and early 20th centuries discovered three elementary particles that make up the atom: a proton and a neutron that concentrate almost the entire mass of an atom in a small central area called the nucleus; and electron, a small mass (compared to a proton or neutron) and in continuous motion around the nucleus at a great distance from it. According to this, the mass of the atom can be considered to correspond to the mass of its nucleus and therefore is in the nucleus, where there is a difference between atoms, that is, between the elements and others. Atomic number and mass number Since the mass of an atom is mainly the mass of its nucleus, and this is formed by protons and neutrons, is determined: the mass number: it is the number of protons and neutrons of the atom. The number of neutrons can vary between atoms of the same element, so we determine: Atomic number: this is the number of protons of an atom. Thus, it is the atomic number that characterizes and distinguishes one atom from another: atoms of the same element have the same atomic number, i.e. the same number of protons. There are known elements with atomic numbers from 1 to 118. The smallest is hydrogen with a single proton, while the highest atomic chemical element in nature is americium with 95 protons. The largest atomic numbers were artificially obtained by the bombardment of smaller atoms by alpha particles. As a rule, the atomic number is symbolized by the letter AND serial number with the letter A, representing itself with a subscript and superscript, respectively, to the left of the chemical symbol to which they correspond: Isotopes We said that the atoms of the same element have the same atomic number (number of protons), but should not have the same more complex number (number of protons plus neutrons). Thus, we define: Isotopes: atoms of the same element (with the same atomic number), which differ in the number of neutrons (different larger number). Most chemical elements have more than one isotope, although some are unstable. The existence of isotopes means that not all atoms of the same element have the same mass (since they may have more or less neutrons), so the atomic number is the criterion chosen for their classification. In addition, this has another important consequence: the atomic mass of the element is the weighted average value of the atomic masses of its isotopes. That is, when calculating the atomic mass of each element, it is necessary to take into account the mass of its isotopes and the relative share in which they are represented in the Nature. This difference in mass is especially noticeable in three isotopes of hydrogen, called protitia (without neutron), deuterium (one neutron) and tritium (two neutrons): If you consider that the mass of the proton is almost the same as that of a neutron, deuterium has about twice as much mass as protia, and the mass of tritium will be, more or less, three times greater. However, since the natural abundance of protia is 99.98% (out of every 10,000 hydrogen atoms, 9998 are protia), the weighted average of its atomic masses is close to one: 1'00794 u. However, sometimes we encounter atoms, which have an electrical charge, and this is due to the loss or increase of a certain number of electrons: Atoms that have lost electrons acquire a positive charge (they have more protons than electrons) and are called cations: Atoms that have received electrons acquire a negative charge (they have more electrons than protons) and are called anions : Metallic elements tend to form cations, while non-metallic ones usually lead to non-metallic ones. Obviously, the change in the number of electrons does not affect the nucleus, so both these and anions still belong to the same element as the atom of origin (since they do not change their atomic number). The ion's electrical charge is indicated by a superscript to the right of the chemical element symbol: Naz, Mg2, Fe3, N3-, O2-, Cl-. The decided example of the atomic nature of matter was already protected in ancient Greece by Leicipo and Democritus in the 5th century BC However, at that time it was not a dominant idea, and the platonic and aristotle concept of continuous and endlessly resolved matter was the one that prevailed and performed for more than two millennia. The word atom comes from the Latin amus, and it is from the Greek ἄτομον, an atom that means indivisible, which cannot be shortened. The atomic model of Leicipo and Democrit Dalton only in the 19th century, based on their own research and previous experiences of Lavoisier and Proust, developed the first atomic (scientific) model of matter, considering that it ultimately consists of tiny indivisable particles that have no structure or internal composition. Dalton's atomic model is based on the following tenets: matter consists of small, indivisable and immutable spherical particles called atoms. All atoms of one element are equal to each other and elements of other elements. Elements are combined with each other in permanent, simple proportions to form connections. In chemical processes, atoms do not break down or change, they simply change into different compounds. John Dalton was the first to use in 1803 symbols representing chemical elements: Symbols of elements, proposed by Dalton in 1803 by the atomic model of Thomson In the late 19th century, the English physicist J.J. Thomson experimented with unloading pipes (crooks pipes), consisting of glass tubes shielding gas at very low pressure, and two metal plates, which, when connected to a high-voltage power supply, produced radiation (cathode rays) from a negative plate (catod) to a positive plate (cathode). Thomson found that these emissions actually consist of small negatively charged particles that we now know as electrons. The deviation of cathode rays at the object of the electric field is proof that the particles that form them have a negative charge. The discovery of the electron not only allowed to understand the electrical nature of matter, but also allowed to reconsider the indivisibility of the atom. Thomson suggested that the atom consists of a homogeneous, positively charged sphere in which electrons are embedded, which provide the negative charge needed to make the atom electrically neutral: the Nuclear model Thomson Atom Model Rutherford A became more knowledge of the atomic structure made possible by the experience of The New yorker Ernest Rutherford, a colleague of Thomson, in the early twentieth century. What he did was bombard a thin sheet of gold with alpha particles (helium nuclei) from a radioactive source (polonium or radius): What Rutherford noticed was that most of the particles crossed the sheet without deviating (or with minimal deviation), some deviated from their trajectory by a significant angle and a minimal percentage of them bounced off the sheet. These results surprised him because they indicated that no matter was as continuous as atoms as it should have been. Its main conclusions were: the atom is mostly empty, so most alpha particles managed to pass through it unhindered. The positive charge of the atom is concentrated in a small area of the atom, so only the alpha particles (also positively charged) that were quite close deviated from their trajectory and, very few, collided with and bounced. In short: in Rutherford's atomic model (1911), a positive charge and almost the entire mass of the atom are concentrated in electrons move at high speed, with negative charges. Rutherford found that the positive charge of the nucleus was due to the existence of a new particle, a proton, with a charge identical to the electron, but the opposite sign and mass almost two thousand times greater. In order for the protons to remain stable inside the atomic nucleus, he assumed the existence of another particle, a neutron (with a mass similar to a proton mass, albeit without an electric charge), which was discovered by the English physicist James Chadwick in 1932. Rutherford Atom Model Current Atomic Model Despite its hits, the atom described by Rutherford has a serious flaw: it is unstable. According to electromagnetic theory, each moving charge emits energy in the form of electromagnetic waves, so the electron orbiting the nucleus loses energy and quickly spirals down with it. The atomic model, proposed by Danish physicist Nils Bohr in 1913, solves this problem and for the first time includes concepts related to quantum mechanics, although it remains an insufficient explanation. Today, the nature and behavior of the atom are successfully explained by the mechanical-quantum model, one of the pillars of modern physics, the development of which is one of the great achievements of science of the 20th century. The 20s. modelo atómico de dalton características. modelo atomico de dalton resumen. modelo atomico de dalton pdf. modelo atomico de dalton descripcion. modelo atomico de dalton experimento. modelo atomico de dalton dibujo. modelo atomico de dalton maqueta. modelo atomico de dalton teoria balasaheb shinde english grammar pdf free download

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