

Example of structure of the atom research paper

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Matter has been identified to have mass and occupy space. The basic blocks that buildup matter are the atom. The atoms cannot be subdivided chemically using the normal means. There are three main categories of matter, liquid, gaseous and solid. Each of these types is made up of elements. If for instance from a block of iron (matter), it is possible to cut it into smaller pieces and finally end up with the smallest piece possible the atom (MathMol).

Most of the atoms are made up of three basic particles, which are the proton, neutron and electrons. The proton refers to the subatomic particle that has a symbol of p or p^+ and with a positive electric charge. The neutron refers to the subatomic particle that has the symbol n and has no net electric charge. The mass of a neutron is a bit larger than the mass of a proton. The electron is an elementary particle and has a mass that is far smaller than that of the proton ($1/1836$). Both the protons and the neutrons are bunched together in the nucleus, which is the center of the atom (Alan and Hui).

Just like the moon moving around the sun, the electrons in an atom move in its orbit around the nucleus. The atoms belonging to the same element are characterized by having a given number of protons in their nucleus. This number is referred to as atomic number. On a normal occasion, the atom has the same number of electrons as the protons in the orbits that surround the nucleus. In a periodic table, the elements are ranked depending on their number of protons.

For instance, a Helium element having 2 protons in the nucleus, the atomic number will be 2 while Iron, which has 26 numbers of protons, in the nucleus, will have its atomic number being 26. In the case of Uranium of 92

protons, has an atomic number of 92 (Alan and Hui). Although the numbers of the protons that are in the nucleus are the same for each atom of a given element, the number of neutrons that are in the nucleus may be different in different atoms belonging to the same element. The atoms of a given element that have an equal number of protons but have a different number of neutrons are known as the isotopes of the element. The identification of the isotopes is done by getting the sum of the number of protons with that of the neutrons resulting into a figure called mass number (MathMol).

For instance, hydrogen element has three isotopes, hydrogen 1 or hydrogen, hydrogen 2 or deuterium and hydrogen 3 or tritium. All the three atoms have different masses but similar proton number (1). It is this proton number that identifies the atoms as hydrogen. The different number of neutrons identifies the different atoms. Since the neutrons have no charge and the electron and proton have negative and positive charges respectively, the equal number of protons and electrons render the atom is electrically neutral. Electrons that orbit at the outermost orbital are the ones that take part in chemical reactions and are the ones that identify the atom chemically. The outermost electrons can either be thrown off by the atom or more of the electrons be absorbed into the outer orbital. When an atom losses either one or more electrons, the final charge of the atom is positive or when an electron is moved into the atom makes the atom negatively charged. The charged atoms are referred to as ions (Technology).

Different forces hold the atom together. The electrons, which are negatively charged, are attracted to the nucleus which is positively charged through the Coulombic attraction. The neutrons are held together in the nucleus of the

atom together with the protons by the strong nuclear force. The atom is said to be stable when the number of neutrons is the same as the number of protons. Most of the atoms have attained this and thus are stable. However, there are nucleus in some atoms that have unequal numbers of protons and neutrons and hence unstable. The nucleus of these unstable atoms tries to attain stability by giving off packets of energy or the particles. The particle emissions are referred to as radioactivity and are emitted at high energy from the nucleus. When the particle hits the electron belonging to another atom, the electron may be knocked off the atom making the atom to have a positive charge. The particles as well as the quanta that are emitted are therefore referred to as ionizing radiation (Alan and Hui).

Most of the atoms that are large and heavy and occur in nature are not stable and are thus radioactive. Some of these atoms include thorium, uranium, radon, radium among others. Other small atoms although are stable, they may have forms that are not stable and thus radioactive (Alan and Hui).

Works Cited

Alan and Meng Hui. Structure of the Atom. 1997. 24 April 2013. .

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