

Methodology Article

On Atom and Electron Based on Protons (p) and Neutrons (n) Pairs

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Abstract: The nuclear particles are formed by p(protons) -n(neutrons) and n(neutrons) -p(protons) pairs. The nuclear particles move in accordance with the law of nuclear particle tracks arrangement and the sub layer arrangement regular, which determines the distribution and movement of electron, and the nature of elements. The energy of electromagnetic, pressure, temperature only affects the nuclear particles, in which, the electromagnetic energy affects the protons, the pressure and temperature affect the neutron, but not electron. Following with the energy balance principle of nuclear particles and the electron, and the nuclear particles gain the energy, adjusting by the electron of distribution and movement to be balance, thereby maintaining the stability of atom.

Keywords: Atom, Electron, Proton-neutron Pairs, Movement

1. Introduction

Atomic model of atomic physics has always been an important research content, from modern to start building the JJ Thomson's "plum + pudding" model, E. Rutherford's nuclear model of atom, to N. Bohr's stationary state to the transition atom model, in particular N. Bohr atom model of steady state transitions, starting from the atomic model, describes the internal structure of the atom respectively, from the basic structure, orbital motion, spin movement, spatial orientation, angular momentum and magnetic moment, and With models in the form of statements out of them, it laid the foundation of modern atomic physics [1]. Nuclear structure has also been the a research center subject of nuclear physics, after confirmed nucleus composed of protons and neutrons and the establishment of shell model, collective motion geometric model and collective motion algebra model. emerge two new area - high-spin states of nuclei and giant resonance studies, to reveal the properties of nuclear structure of nuclei under rapid rotation and higher excitation energy, with the development of nuclear physics, the major studies are ultra-relativistic heavy ion collisions [2], the degrees of freedom of quark and hadrons in nucleus, high-spin, study in

nuclear, the synthesis of super heavy element [3], And radioactive nuclear beam physics [4]; There are many different statements in the birth of nuclear physics. Most people recognize E. Rutherford published the particles on the atomic dispersion Radio experiment article in 1911 [5]; The J. Chadwick experiment confirmed the existence of neutron in 1932 [6]; The Audi G. and others the mass table [7], Even today, drawing these graphs can still give a lot of new physics, such as the quantum phase transition of atomic nuclei [8], N-P interaction [9]; M. G. Mayer and J. H. D. Jensen introduction spin orbit potential, the magic number is correctly reproduced, [10-16]; S. G. Nilsson generalized the spherical harmonic oscillator potential field to the form of the harmonic oscillator potential, which is the Nilsson model [17-18]; Mutually interacting boson model is one of relatively large influence in the field of nuclear physics research. That is mainly used to describe the nuclear collective motion [19-21]. etc. However, these studies found some of the existing theories also have some deficiencies, for example, Bohr atomic model: can only be explained hydrogen atom spectrum, cannot explain the spectrum of multi-electron atoms; the nuclear shell model.

There are some deviations compare the nuclear electrical quadruple, magnetic moment of the quantitative description and the nuclear spin far from full shell with experimental results; the droplet model cannot explain cyclical changes in the nature phenomenon of atomic nuclei. The Integrated model can be a good description of nuclear rotational energy level and vibration level, electrical pole on the nuclear moments, magnetic moments and transition rates γ calculation and experimental values are consistent with the degree of significant improvement, but not consistent. This article puts forward a new atomic model.

2. Several Assumptions

(1) The electron in atom does not absorb any electromagnetic and non-electromagnetic energy outside.

(2) The nucleus of protons and neutrons are rotation around the nuclear core. in the form of spin-zero proton and neutron pairs (the proton side towards electron of the nuclear particles is called p-n, the neutron side towards electron of the nuclear particles is called n-p)

(3) Electromagnetic energy only acting on the protons and electromagnetic energy cannot penetrate neutrons, which is the external electromagnetic energy can only acting on p-n.

(4) Non-electromagnetic energy only acting on the neutrons, but can penetrate through the proton, that is, non-electromagnetic energy can acting on the p-n and n-p.

3. Nuclear Particles p-n and n-p Arranged Law

Electron arrangement and movement conditions, determined by the arrangement and movement of the nuclear particles p-n and n-p pairs, the nuclear particles p-n and n-p pairs are arranged to follow this law.

3.1. The Tracks Arranged Laws of Nuclear Particle p-n and n-p Pairs

the nucleus particle p-n and n-p according to certain orbital motion in the different levels, wave function of p-n and n-p related to the main quantum number n , angular quantum number l and magnetic quantum number m , according to the provisions of spectroscopy, $l = 0$ orbit is called the s orbit; $l = 1$ the orbit is called the p orbit; $l = 2$ the orbit is called the d orbital; $l = 3$ orbital track is called f, s only one track; p orbit has three; d orbit has five; f orbit has 7. The p-n and n-p quantity in layer are n^2 (n behalf of layer), the outermost layer of the p-n and n-p quantity are no more than 8 (the first layer is not more than two), not more than 18 times the outer, third from the bottom layer does not exceed 32.

The p-n and n-p in the same sub-layer, according to the different m values, there are still different spatial orientation of the orbital.

3.2. The Sub-layer Arranged Laws of p-n and n-p Pairs

p-n and n-p in each sub-layer; in general, the orientation of

the p-n and n-p is certain.

3.2.1. The Sub-layer Arranged Laws of p-n and n-p Pairs in Metals

i. While the outer layer is s-sub-layer, the s-sub-layer will take p-n, the corresponding p-sub-layer to take n-p, the d-sub-layer to take p-n, and the f-sub-layer to take n-p;

ii. While the outermost layer is the p-sub-layer, the p-sub-layer will take p-n, the d-sub-layer to take n-p, the f-sub-layer to take p-n, and the s-sub-layer to take n-p.

iii. While the outermost layer is the d-sub-layer, the d-sub-layer will take p-n, the f-sub-layer to take n-p, the s-sub-layer to take p-n, and the t p-sub-layer to take n-p.

3.2.2. The Sub-layer Arranged Laws of p-n And n-p Pairs in Non-metals

i. While the outer layer is s-sub-layer, the s-sub-layer will take n-p, the corresponding p-sub-layer to take PN, the d-sub layer to take n-p, and the f-sub-layer to take p-n;

ii. While the outermost layer is the p-sub-layer, the p-sub-layer will take n-p, the d-sub-layer to take p-n, the f-sub-layer to take n-p, and the s-sub-layer to take p-n.

c. while the outermost layer is the d-sub-layer, the d-sub-layer will take n-p, the f-sub-layer to take p-n, the s-sub-layer to take n-p, and the t p-sub-layer to take p-n.

While the number of neutrons than protons in isotopes, the excess part of the neutron is free neutrons in the nucleus; the number of protons than neutrons, the excess part of the proton in the nucleus is free; these free neutrons and protons can continue to impact the p-n and n-p, resulting in nuclear reactions, change of electronic motion; the movement track of any elements and their isotopes is different.

4. The Energy Balance Principle of Electron and p-n and n-p Pairs

The energy balance principle of electron and p-n and n-p is: while the protons and neutrons in the p-n and n-p receive energy, the electron in corresponding orbit and its e-campaign will occurring balance changes, as long as there is no external energy to make atomic nuclear reaction occurred, when the role of energy to eliminate, the corresponding electron orbit and its movement to restore the original state.

4.1. The Balance Principle of Electromagnetic Energy Acting on the p-n Pairs

electromagnetic energy is applied to the p-n nuclear particles in the proton p, the reaction speed of the proton p in p-n nuclear particles to electromagnetic energy and electromagnetic energy hf (h is Plank's constant, f is the frequency of electromagnetic wave radiation intensity) and S or Poynting vector S , different level track on the p-n particle only accept a f frequency electromagnetic energy; at a certain frequency and intensity of radiation of S_f electromagnetic energy environment, p-n nuclear particle velocity V_{p-n} is certain, the corresponding electronic velocity is constant, p-n nuclear particle velocity V_{p-n} and at a certain frequency of F

under the radiation intensity is proportional to S_f ,
i.e. Formula (1)

$$V_{p-n} = K_f S_f$$

K_f is the constant of proportionality, K_f value in different level track are different. When the radiation intensity S_f changes, the V_{p-n} of p-n nuclear particle velocity will change, and the corresponding electronic velocity V_e will also change. When the changing rate, $S_{f2}-S_{f1}/t_2-t_1$, of radiation intensity S is large, some electrons because of motor inertia, will escape instantaneously to get rid of proton magnetic attraction, the electrons escape number N_e is proportional to the changing rate of radiation intensity $S_{f2}-S_{f1}/t_2-t_1$.

i.e. Formula (2)

$$N_e = K_s (S_{f2}-S_{f1}/t_2-t_1) = K_s \Delta S / \Delta t$$

K_s is the proportion constant, different level track K_s values are different. While S_f constant or affect on the proton electromagnetic energy disappears, protons in the corresponding atomic physical and chemical properties are unchanged.

4.2. The Balance Principle of the Non Electromagnetic Energy Effect to Nuclear Particle

4.2.1. The Balance Principle of the Pressure Effect to Nuclear Particle

The non-electromagnetic energy affects on neutron in nuclear particle only. When this energy is the pressure, the movement speed of p-n particles or n-p particle (V_{p-n} or V_{n-p}) is inversely proportional to pressure.

i.e. Formula (3)

$$V_{p-n} \text{ or } V_{n-p} = K_p / P$$

K_p is the proportion constant, the K_p values of different elements are different.

When pressure changes, the p-n nuclear particles or n-p particle velocity (V_{p-n} or V_{n-p}) changes, by increased pressure is to decelerate the speed of neutron, reduce pressure to increase the speed of neutron. The corresponding electronic velocity V_e will change, when the rate on changing of pressure. P_2-P_1/t_2-t_1 is large, some electrons because of motor inertia, will escape instantaneously to get rid of proton magnetic attraction, the electrons escape number N_e is proportional to the change rate absolute value of pressure P_2-P_1/t_2-t_1 .

i.e. Formula (4)

$$N_e = K_p | P_2-P_1/t_2-t_1 | = K_p | \Delta P / \Delta t |$$

In which, in the process of pressure changes, proton and neutron will produce separation force. If the separation force is less than nuclear force, while pressure constant or pressure effect on the neutron disappears, neutron in the nucleus can rapidly absorb electrons equal to those emission electrons number, the corresponding atomic physical and chemical properties is unchanged. If the separation force is greater than nuclear force, it will make the proton and neutron separation

in nuclear particle; electron and proton will combine into a new neutron, will produce the so-called pressure nuclear reaction.

4.2.2. The Balance Principle of the Temperature Effect to Nuclear Particle

When this energy is the temperature, the movement speed of p-n particles or n-p particle (V_{p-n} or V_{n-p}) is proportional to temperature.

i.e. Formula (5)

$$V_{p-n} \text{ or } V_{n-p} = K_t T$$

K_t is the proportion constant; the K_t values of different elements are different.

When temperature changes, the p-n nuclear particles or n-p particle velocity (V_{p-n} or V_{n-p}) also changes, by increasing temperature is to increase the speed of neutron, reduce temperature to reduce the speed of neutron. The corresponding electronic velocity V_e will change, when the rate of change of temperature, T_2-T_1/t_2-t_1 , is large, some electrons, because of motor inertia, will escape instantaneously to get rid of proton magnetic attraction, the electrons escape number N_e is proportional to the change rate absolute value of temperature T_2-T_1/t_2-t_1 .

i.e. Formula (6)

$$N_e = K_t | T_2-T_1/t_2-t_1 | = K_t | \Delta T / \Delta t |$$

In which, in the process of temperature change, proton and neutron will produce separation force, if the separation force is less than nuclear force, while temperature constant or temperature effect on the neutron disappears, neutron in the nucleus can rapidly absorb electrons equal to those emission electrons number, the corresponding atomic physical and chemical properties is unchanged. If the separation force is greater than nuclear force, it will make the proton and neutron separation in nuclear particle, electron and proton will combine into a new neutron, will produce the so-called thermonuclear reaction.

5. Inference

(1) The relationship p-n and n-p wave function $|\psi_1(r_1, t)|^2$ and electron wave function is:

$|\psi_2(r_2, t)|^2$ is: $|\psi_1(r_1, t)|^2 = |\psi_2(kr_2, t)|^2$ (k is constant of proportionality).

(2) Under the different environment of electromagnetic and non-electromagnetic energy, all or part of the electron orbit radius is different; but their physical and chemical properties are the same.

(3) Under the electromagnetic energy or high temperature or high pressure, after the part of the electrons escape, if there are not available electrons to absorb outside the atom, the atoms would be ion form, in the limit energy, the atoms will be its nucleus form.

(4) When the external pressure to a certain extent, all p-n and n-p will be isolated to be neutrons and protons, electrons are inhaled nucleus by proton, electrons and protons will be

together to form neutrons, this time, the physical and chemical properties of atoms completely changes that can become neutron nuclear.

6. Discussing on Some Problem of Atomic Physics

(1) The electrons escape and work function:

The escape of electrons in atoms is, under the electromagnetic energy, high temperature or high pressure, the corresponding electron orbital radius changes. If this changes are very fast, some electron will escape Instantaneous because of inertia and get rid of the proton gravitational, in a certain energy, any electrons in any electronic tracks are likely to escape, there is no work function problems, escape of electrons in atoms, not because of the role of external electromagnetic energy, high temperature or high pressure affect on outermost electrons making these electrons escape Instantaneous because of inertia and get rid of the proton gravitational.

(2) Hot electron emission:

The hot electron emission of atoms is, the neutron faster with heat. The n-p in center track may turn into p-n due to the magnetic gravity of electron and proton, causing electron orbit changes, in the process of some or all electrons escape Instantaneous, because of inertia and get rid of the proton gravitational, at a certain temperature limit, any electron in any electronic orbits are likely to escape

(3) The metal and nonmetal elements:

The metal and non-metallic determined by the p-n and n-p corresponding outer electrons, rather than determined by the number of outer electrons.

(4) Photoelectric effect:

The light is electromagnetic energy, photoelectric effect, it is light energy ($E = hf$, h is Plank's constant, f is the frequency of electromagnetic waves or photons) acting on the p-n, making the electron orbital radius of the corresponding change, if this change is very quickly, some or all electrons escape Instantaneous because of inertia and get rid of the proton gravitational, under a certain frequency f and the intensity of light, electrons in any electronic orbit corresponds to the p-n orbit are likely to escape, but not only the outer electron escape.

(5) Free electron:

In a certain temperature, electromagnetic energy, electrons in any element may be escape, electrons in the metal elements more easily escape, it is because the outermost orbit in the metal element are p-n, more vulnerable to the role of electromagnetic energy and temperature, not because there are free-electron in metals.

7. Conclusion

This theory is a hypothesis, it makes perfect description and explanation to atomic electronic orbital, distribution and movement, as well as elements of nature. However, it has a number of issues need to be tested, for example, when pressure is extremely large, will the material still appear the phenomenon of superconductivity? How much the pressure will be? If making the temperature down to absolute zero or the pressure to an extreme high in a very short period of time, will the electrons escape? Will nuclear reaction occur? If using many different frequency light with high-intensity irradiate metal atoms at the same time, will more electrons escape? Once these tests issued, it will have important theoretical significance and application value.

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