THE MOST IMPORTANT QUANTUM NUMBER

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In polytronic model of structure of substance, the process of photoionization of atoms is considered as separating off an energy ring from one of radial polytrons, as a result of absorption by atom of energy of gamma - quantum.
During an exchange of energy with external space, the radial polytrons of atom participate only.
The resonant energy of radial polytron consist of three component.
The energy of tangential oscillations

$$W_t(m,n_r)=\frac{1.08612\cdot K^4\cdot 4\cdot\pi\cdot M_e\cdot c^2}{q_e}\cdot\left[\frac{\left(\frac{n_r}{K}\right)^4}{\left(\frac{m}{Z}\right)^2+\left(\frac{n_r}{K}\right)^2}\right]\quad |\mathrm{eV}| \qquad (1)$$

The energy of radial oscillations

$$W_r(m,n_r)=\frac{6\cdot\pi\cdot M_e\cdot c^2}{q_e}\cdot\left[\frac{0.1875\cdot m^4\cdot n_r^4}{m^4+0.1875\cdot n_r^4}\right]\quad |\mathrm{eV}| \qquad (2)$$

The energy of pulsation of dynamic layer

$$W_d(m,n_r)=\frac{3\cdot\pi\cdot M_e\cdot c^2}{q_e}\cdot\left[\frac{m^2\cdot n_r^2}{64\cdot(m^2+4)+n_r^2}\right]^2\quad |\mathrm{eV}| \qquad (3)$$

where K=3.3515 – parameter of geometrical form of emitter of electromagnetic energy in atom;
M_e = 9.10938188×10^{-31} |kg| – electron rest mass;
c = 299792458 |m/s| – speed of light in vacuum;
q_e = 1.602176462×10^{-19} |C| – elementary charge;
Z – serial number of element in The Mendeleyev's Table;
m – frequency order of polytron (main quantum number);
n_r – amplitude order of radial polytron.

The factors 1,08612 and K=3.3515 are found from a condition of a constancy of length of quantoide at mathematical modelling resonant processes in classical mechanical objects. At the same time, these factors are in the full consent with spectra of radiation of atoms.
The product 1.08612×K^4=137.036, i.e. it gives the inverse value of fine structure constant α.

The given work concerns interaction of gamma - quantums with atoms of hydrogen.
The amplitude order of radial polytron in atom of hydrogen $\boldsymbol{n_r} = \boldsymbol{n_e}$ = 0.0528466.

At the frequency order $\boldsymbol{m}$=2 the hydrogen radial polytron possesses energies:
$W_t(2, n_e)$ = 13.598 eV
$W_r(2, n_e)$ = 14.086 eV
$W_d(2, n_e)$ = 0.002 eV
$W_t(2, n_e) + W_r(2, n_e) + W_d(2, n_e)$ = 27.686 eV

At transmission of gamma - beams through substance, the processes of a birth of electrons and electron-positron pairs take place.

a)

b)

c)

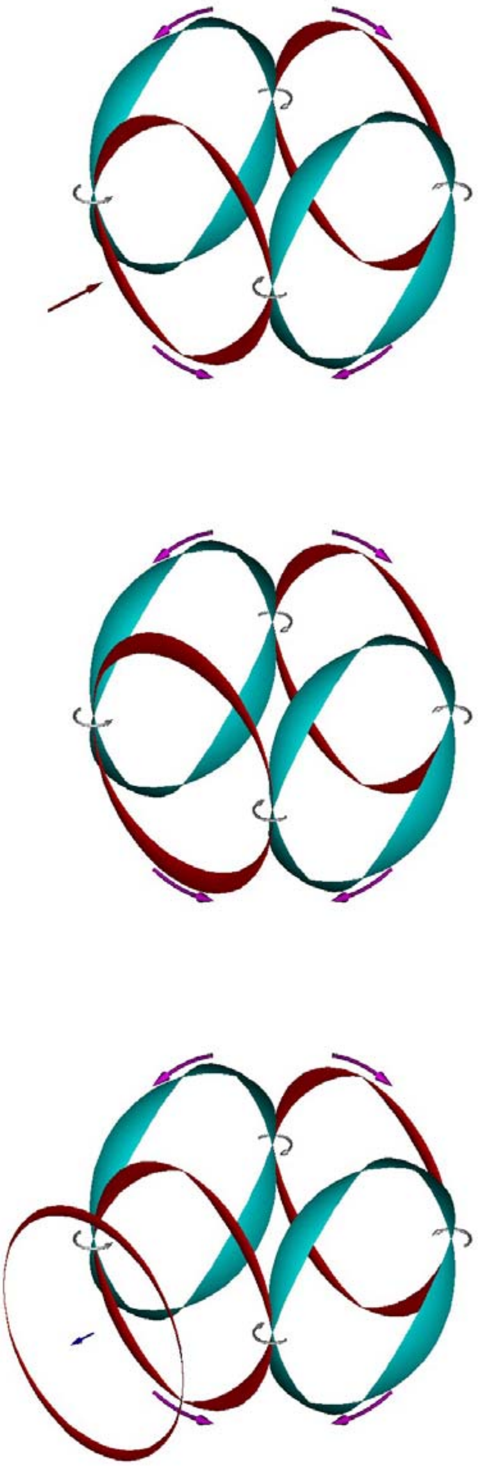

Fig. 1
a) the left-spiral hydrogen atom at m=4:
b) the near radial polytron of atom is excited up to the energy level m=2:
c) the hydrogen atom and thrown electron.

If energy of the entering gamma-quantum is
$0.511MeV < W_\gamma < 1.02MeV$
then the atom throws out an electron.
This process is shown schematically in fig.1(a,b,c).
In fig.1a it is shown left-spiral atom of hydrogen, in which all four polytrons are excited up to the energy level ***m***=4.
The straight red arrow designates the direction of entering of gamma - quantum into near to the observer the radial polytron.
As a result of absorption of gamma - quantum, this radial polytron is raised up to the energy level ***m***=2 (fig.1b).
Radial polytrons cannot radiate quantums from an energy level ***m***=2, as they have no free nodes.
Therefore, to get rid of superfluous energy, the polytron separates from itself an easy energy ring (fig.1c).
In the simplest case with atom of hydrogen, the separated ring represents an easy radial polytron in diameter 197.714 picometers (pm).
After "birth" of the ring-electron, all polytrons in atom remain some time in non-equilibrium state of lack negative (left-spiral) energy.
The kinetic energy of the thrown out electron is equal $W_k = W_\gamma - 0.511MeV$.
However, this rule for kinetic energy of electron operates only up to energy of gamma - quantum $W_\gamma < 1.02MeV$.
If energy of the entering gamma-quantum is
$1.02MeV < W_\gamma < 2.04MeV$
then the atom throws out electron and positron.
During interaction, the gamma - quantum passes through the both radial polytrons in atom of hydrogen, and transfers to each of them some share of the energy.
In result, the atom throws out two rings, but besides the gamma - quantum changes spirality in the second ring with opposite.
Therefore, the second ring becomes as right-spiral, i.e. it becomes positron.
In fig.2a the location of electron and positron is shown at the moment of their start from two radial polytrons on the opposite sides of atom of hydrogen.

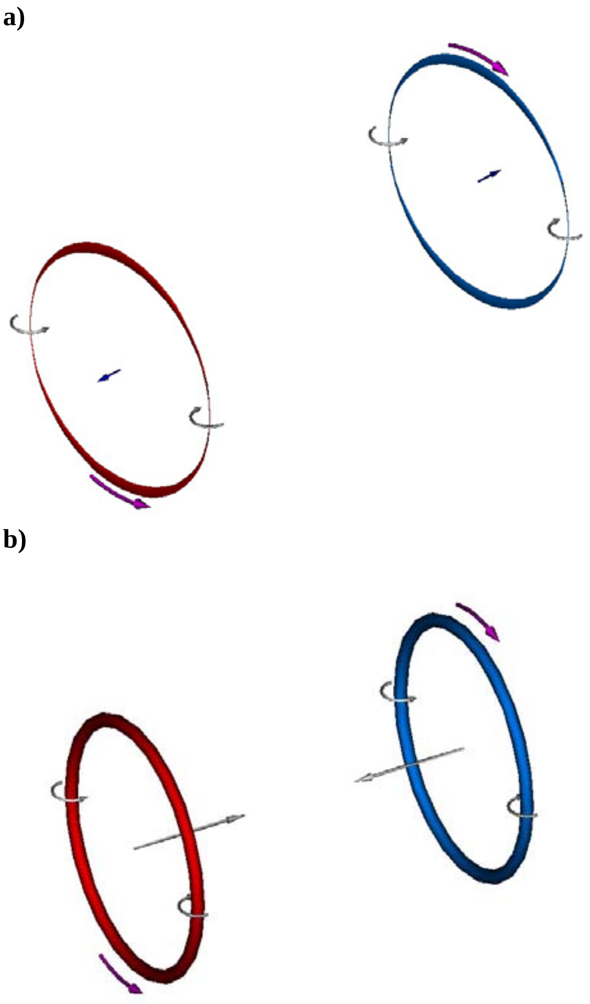

Fig. 2
a) electron and positron at moment of flying out radial polytrons of atom at m=2;
b) the movement of electron and positron at m=1 in an external electric field.

If now to include (to put) an electric field in a direction against vectors of own speed of electron and positron, then electron and positron will start to move towards one to another. This movement is shown in fig. 2b. During the accelerated movement under action of an electric field, the energy of electron and positron will grow.

Electron and positron, as well as radial polytrons, are capable to reserve energy in two ways – by means of changing of the frequency order $\boldsymbol{m}$, and by means of changing of the amplitude order $\boldsymbol{n_r}$. And, the increasing in the amplitude order can occur only, when the polytron cannot change the frequency order.

For example, at increasing of speed of electron and positron (fig. 2a) up to value 4.9×10^6m/s, particles get the frequency order $\boldsymbol{m=1}$.

In fig.2b the electron and positron at the frequency order $\boldsymbol{m=1}$ are conditionally shown as anchor rings.

The energies of each particle at $\boldsymbol{m=1}$ and at $\boldsymbol{n_r=n_e}$ will be equal:

$W_t(1, n_e)$ = 54.384 eV
$W_r(1, n_e)$ = 14.086 eV
$W_d(1, n_e)$ = 0.0003 eV
$W_t(1, n_e) + W_r(1, n_e) + W_d(1, n_e)$ = 68.470 eV

At collision of two these particles there should be the particle with resonant energy equaled 136.94eV.

Probably, this particle belongs to the class neutrino, since its charge is equal to zero.

At increasing of speed of electron and positron (at $\boldsymbol{m=1}$) up to relativistic values, the amplitude order can get value $\boldsymbol{n_r}=K$=3.3515.

The energies of these relativistic particles will be equal:

$W_t(1, K)$ = 439.982 MeV
$W_r(1, K)$ = 9.241 MeV
$W_d(1, K)$ = 0.006 MeV
$W_t(1, K) + W_r(1, K) + W_d(1, K)$ = 449.229 MeV

At a head-on collision of relativistic electrons and positrons, as it occurs in accelerators on counter beams, there should be arise the particles with energy 898.458MeV.

At that, if energy of electron is more, than energy of positron, then the proton will be arise, and if energy of positron is more, than energy of electron, then the antiproton will be arise.

In conclusion, we would like to tell about our understanding of "relativity".

Movement of the charged particle in an electric field is similar to movement of a sailing vessel in the sea. The sailing vessel cannot move faster than wind. Similarly, the charged particle cannot move faster than “an electric wind ”, i.e. faster, than speed of light.

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