NUCLEI of ATOMS

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Abstract

In the article the theory of atomic nuclei is set up and the impact way of implementation of thermonuclear reactions is offered

THE THEORY of ATOMS NUCLEI

If components of "elementary" particles moves well-ordered and stability is determined, basically, dynamic stability of gravidynamic systems, thus the relativistic increment of mass is equally arranged on increase of measured mass and bond energy, in nuclei it is necessary conduct speech about static stability of gravidynamic systems, since in them the particles are relatively immobile in that sense, as we speak about "immovability" of atoms in points of lattice of a solid. Thus the defect of mass is watched, at which one the part leaves on bond energy, and "the part of mass of initial particles is transmitted in this or that form to an environment" (N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 423). Really, if the nucleons executed gravidynamic connection at the motion, we would watch not a defect of mass at formation of a nucleus, and increment it, equivalent bond energy (approximately 8 MeV). Therefore connection of nucleons in a nucleus implements at the expense of a gravidynamic field of nucleons similarly, how the magnetic fields of ring-type frameworks with an electric current would interact. This analogy does clear a picture of static interplay of nucleons, though the blind faith in the quantum laws hinders modern nuclear physics to clear up this problem. The modern physics considers, that the nucleons in a nucleus are retained at the expense of exchange π-mesons, mass which one, approximately, seven times is less than mass of a nucleon. Thus instead of a defect of mass at formation of a nucleus we should watch increase of its mass at the expense of pions, that actually is not present.

"The common nature of motion of nucleons is known are the quantum laws. Mathematical expression for nuclear forces is not obtained, therefore of physicists are compelled to construct different models of nuclei for explanation of this or that processes. There are different models of nuclei well accounting for separate processes, but for the present it is not offered to single model". N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 424.

Technique all same - adjustment under the answer: "Picking up the order of levels of thin and rough structure, it was possible to explain magic numbers, spin and magnetic moment of the majority of nuclei". Ibidem, page 426.

"Short-range nature of nuclear forces and charge independence are transmitted by a potential of the Yukawa. However nuclear forces have a lot of other properties, which one are not transmitted by this expression. At approach of centers of nuclei up to spacing intervals, smaller, than sum of their radiuses, between them start to act powerful repulsive force precluding their mutual passing through each other. The nuclear forces have property of saturation. They depend on orientation of a spin; have off-center nature and some other properties. To take into account these properties of nuclear forces, the different versions of the theory of nuclear forces - pseudoscalar, vectorial, pseudovector, tensor were offered. However each of versions has only advantage in explanation of one of the sides of nuclear forces. The satisfactory single theory does not exist yet. Most reasonable is the pseudoscalar version with a pseudovector bond (from one title it is visible, that in this theory as sensible physical sense and does not smell - V.K.)". N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 428.

Here it is necessary to pay attention to that circumstance, that the quantum physics does not explain a reason of repulsing of nucleons in a nucleus precluding "insertion" of nucleons each other under operating of nuclear (gravidynamic) forces. Within the framework of developed notions of the answer on this problem is obvious: the repulsing of nucleons takes place under operating same of gravidynamic forces at unidirectional motion a neutrino of approaching nucleons, inside which they moves counterly and are attracted. "These experiments have shown also, that on spacing intervals 0.3 – 0.5 fermi between nucleons arise a very large repulsive force (for nucleons there is "a repulsing core") and that the nuclear forces depend not only on spacing interval between interacting particles, but also from mutual orientation of their spins and so-called of isotopic spins… Some analogy for nuclear forces can be found only in magnetic interplay dependent on mutual orientation of poles of magnets, but the nature of operating of nuclear forces is much more complex". Physics of space, "Soviet encyclopedia", M., 1976, page 646-647. The repulsing starts to prevail above attraction at approach of nucleons on spacing interval of smaller diameter of a nucleon (about 1 fm). To be pulled together so that a neutrino in miscellaneous nucleons moved to the counter sides and were attracted does not give common the gravidynamic moment of nucleons, since in this case unlike of a gravidynamic pole them are repulsed. Thus, alone organizing incentive of nuclei, the same as and in case of atoms, and in any other cases, is the aiming of a system to a minimum of potential energy, which one is reached by a minimum of potential energy of each nucleon.

Here it is necessary to find out reasons of stability of neutrons in a nucleus conditioning stability and nuclei. As against official notionы new physics explains stability of neutrons in a nucleus to that they are in powerful a gravidynamic field, which one exceeds those values, which one it would be possible to achieve for ultra relativistic neutrons. The defect of mass at formation of a nucleus as a matter of fact goes on strengthening of connections components of a proton and neutron. "However before to go further, we shall explain, why in the majority of atomic nuclei (majority them are radioactive and anyhow bound are connected just to instability of a neutron - V.K) in them neutrons are steady and are not disintegrated, as a free neutron, during 15 min. It is necessary to search a reason for it in operation of Pauli's exclusion principle, which one in an equal measure is applicable also to protons and neutrons of a nucleus; this principle very strongly limits (in essence prohibits) decay of a neutron in a nucleus (so prohibits whether or not? - V.K.) because of absence there of free (vacant) conditions accessible to protons with low energy, arising the after of decay of a neutron". Fundamental structure of a matter" “World", M., 1984, page 82-83. This statement is contradicted very widespread β-decay of nuclei, at which one the protons with low energy will be formed.

Let's consider a constitution of some isotopes from the point of view of detection of principles of construction of any nuclei. The nucleus ${}_1H^2$ is figured on a figure 1.

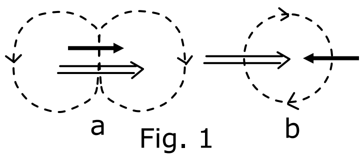


Fig. 1

The plane of orbits a neutrino in nucleons is perpendicular plane of a figure, the current of traffic a neutrino is shown arrows, and the neutron is figured by (for of convenience) twin arrow of greater length, since diameter of a neutron in 1.5 times more proton. The dashed arrows shown a direction of a gravidynamic field.

There are only two possible versions of arrangement of nucleons: "*a*" and "*b*". Apparently, that only version "*a*" provides a more depth of a potential well for each nucleon, therefore it and will be realized. "...the experiment demonstrates that the spin of a deuteron is peer 1". N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 421. If to speak simply, a proton and neutron in ${}_1H^2$ are gyrated in one side (fig. 1a), since official physics considers an angular momentum of nucleons equal $\hbar/2$.

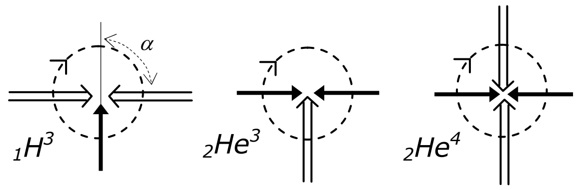


Fig. 2

The nuclei $_1H^3$, $_2He^3$ and $_2He^4$ (α - particle) are figured on a figure 2. For a deuteron (fig. 1a) the proton in a small degree draw off on itself an electron of a neutron, therefore orbit of an electron is augmented slightly. Together with it augmented on $0.02232\mu_n$ a negative magnetic moment of an electron, which one in a free neutron is made $-4.7057\mu_n$. On a figure 12.2 the gravidynamic field on the one hand aims to collect all "coils" together, and on the other hand mutual repulsing of protons aims them to move apart, therefore for H^3 the angle α will make 92.9^0, and for He^3 87.8^0. In view of these remarks, the magnetic moments (in units of a nuclear magneton) indicated particles will coincide with experimentally retrieved (Reference Book of the chemist, M.-L., 1963, page 317): a neutron -1.9130, proton 2.79270, deuteron 0.85738, H^3 2.9788, He^3 -2.1274. For He^4 the magnetic moment is peer to zero point because of a full symmetry arrangement of nucleons.

We see that for α- particle the gravidynamic field basically is massed inside a torus ring formed by nucleons, therefore it is the strongest element of all nuclear structures (analogy to the inert gases having a completely formed 8-electronic torus). For the same reason two α-particle can not forms strong nuclei ($_4Be^8$), since the coulomb repulsion appears sufficient for destruction of such nucleus because of very weak of gravidynamic connection. From a figure 1 and figure 2 becomes understandable, why there is no such expedient process, as: $H^2+H^2 \rightarrow He^4$, and there are processes: $H^2+H^2 \rightarrow He^3+n$ or $H^2+H^2 \rightarrow H^3+p$. It is conditioned by that for formation $_2He^4$, two deuterons are necessary as a matter of fact previously to shatter and to react owe at once four formed particles. In conditions of super-high pressure (and, certainly, temperatures) such process is possible also: $4_1H^1 \rightarrow {}_2He^4+2e^++2\nu$ at "birth"

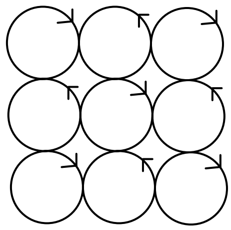


Fig. 3

of new stars.

That the α-particles could be retained by a gravidynamic field, it is necessary a gravidynamic flow (is comparable with a flux) bifurcate, that is shown on a figure 3.

For α-particles it will look, as shown in a figure 4.

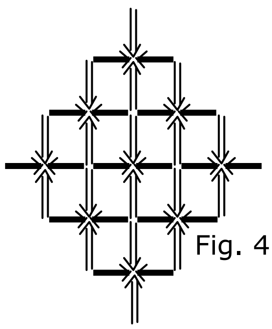


Fig. 4

In such quasicrystalline to structure all the α-particles are equivalent not only among themselves, but also with their connector assemblies (which one are indistinguishable from α-particles), therefore it has exclusive strength. For formation of three-dimensional structure the α-particles are superimposed on two-dimensional structure figured on a figure

4 so, that the motion a neutrino in nucleons will be opposite. Thus the strength bond between layers α-particles will be less, than inside a layer. The evenness of protons and neutrons in strong nuclei is conditioned by that with increase of quantity of nucleons in the connector assembly, its strength increases, but connector assembly can not have more than two protons and two neutrons, therefore exuberant neutrons prefer to collect by pairs for connector assemblies. This rule is a consequent of gravidynamic interplay and allows figuring on a figure 5, as an example, all known steady isotopes up to $_8O^{16}$.

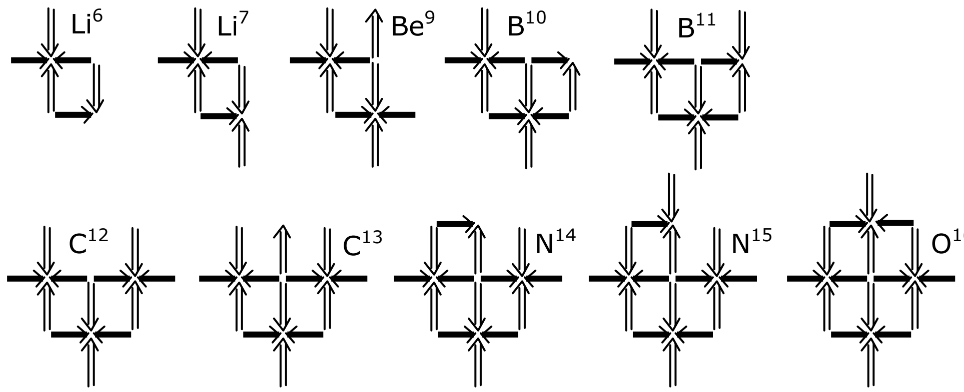


Fig. 5

Thus, for even-even nuclei (with an even number of protons and neutrons) the magnetic moments of nucleons are completely balanced behind exception only of some nuclei. "...all nuclei consisting of an even number of protons and an even number of neutrons (so-called of even-even nuclei), have in a ground state a zero spin. It speaks about definite order in motion of nucleons resulting in almost full mutual compensation of moments of momentum of separate nucleons". Physics of a microcosmos, "Soviet encyclopedia ", M., 1980, page 500. Thus the evenness of nuclei in this book is understood only in mathematical, but is not orthodox - physical sense. "The considerable characteristic of a condition of a nucleus - its evenness. It particular quantum characteristic which is not having of classic analog". Ibidem, page 501.

The nuclei of atoms can be formed by three ways. A preferential way of formation - "cold" condensation of neutrons with their subsequent transformation in protons inside a nucleus as required. In what this necessity consists, it will become clear from further. The second way of formation - "thermal" as a result of one of varieties of a collapse, about what we shall speak in section dedicated a collapse. The same way can be realized and "cold" image, most perspective for the future power engineering. The third way is known - "thermal" synthesis in stars. For decreasing quantity of nucleons in a nucleus there are only two paths - decay of high-gravity nuclei at the expense of a radioactivity or effect from the outside of sufficient force.

Since a nucleus of oxygen there is energetically expedient capability on the formed plane from four α-particles to collect new α-particles with the subsequent haul them on a plane to destination or without those. Thus built in a plane the α-particles will forms the most expedient configuration such to ensure between with α-particles possible large number of connector assemblies with possible by large number of nucleons in each unit. Therefore Ne^{20} will forms structure figured on a figure 6.

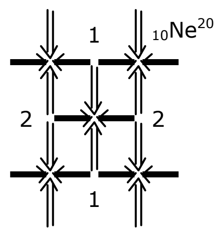


Fig. 6

For example, one of α-planes of a nucleus of an isotope 20Ca48 will look, as shown in a figure 7.

Then on a plane α-particles one more will be step-by-step formed precisely same plane with a backward motion of nucleons, thus $_{20}Ca^{40}$ a nucleus which one conditionally it is possible to figured so: *Ca*(55), where the digits in brackets mean number α-planes and number of particles in each plane. The exuberant neutrons, naturally, can not be inside a plane and all time are pushed aside out. "...the radius of action of nuclear forces is more some than radius of a sphere, in which one the protons are distributed. It is possible, that it is connected also that the neutrons are distributed on a sphere of greater radius". N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 420. For example, one of α-planes of a nucleus of an isotope $_{20}Ca^{48}$ will look, as shown in a figure 7. "At little change of number of nucleons some non-regular changes of radius take place. For example, at transition from $_{20}Ca^{40}$ to $_{20}Ca^{48}$ radius of distribution of charges practically does not change (that is visible from fig. 7 - V.K.). From the point of view of research of structure of a nucleus the considerable concern introduces distribution in a nucleus both protons and neutrons. So, has appeared, that neutronic radius of a nucleus Ca^{48} approximately on $0.14 \cdot 10^{-13}$ cm is more protonic (it speaks that inside a nucleus there are "clean" α-particles, and the neutrons are pushed aside in surface layer - V.K.)". Physics of a microcosmos, "Soviet encyclopedia", M., 1980, page 499.

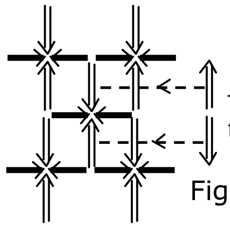


Fig. 7

Naturally, that spacing interval between nucleones inside α-plane and between planes almost equally also makes, approximately, 1 fm. It is possible to build in a plane with 5 α-particles 2 α-particles in a position 1 (fig. 6) with formation 7 particles and in a position 2 with formation of a closure structure from 9 α-particles to which one already it does not pay something to add, except for exuberant neutrons. Thus, the planes with 5, 7 and 9 α-particles give the strongest nuclei. Now we can figured structure of nuclei: *He*(1), *Ne*(5), *Ca*(55), *Ni*(77), *Kr*(99), *Pd*(995), *Sn*(997), *Xe*(999), *Gd*(5999), *W*(59995), *Pt*(79995), *Pb*(79997), *U*(579997), *No*(5799975). Apparently, that practically it is possible to imagine any nucleus, in particular composite, as several isomers, is similar to molecules and elementary particles. Behind plumbum the movability α-particles both on α-plane, and inside it so increases, that the formation of definite structure is strongly hampered. The exuberant neutrons place outside of a nucleus. On a figure 8 the median plane of an isotope $_{54}Xe^{136}$ with 28 exuberant neutrons is figured.

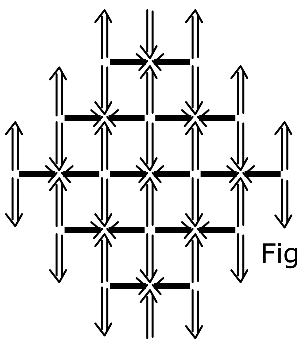


Fig. 8

Because of such constitution of nuclei a double-humped curve of debris also is received, since at not so strong effects on a nucleus, it is shattered on a weak place lengthways α-planes. "The theory forecasts, that at dividing the symmetrical debris should be watched, i.e. with equal masses and equal charges, however, the experiment demonstrates, that the debris are asymmetrical.... The curve "an output - mass number" demonstrates, that the maximum output, equal 6 %, corresponds A=95 and A=139. The symmetrical dividing has an output about 10^{-2} %, i.e. this very infrequent phenomenon". N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 478-479.

The theory of a nucleus of new physics forecasts, that the nucleus of uranium having a constitution 579997 will be cleaved at "weak" effect on it on asymmetrical debris on the most weak place lengthways α-planes with 9 α-particles, for example, so: 579-997 or so: 5799-97. Two debris with summary number α-particles in them, equal 46 at the end should be received. Apparently, that these debris should have minimum potential energy, i.e. to be maximum symmetrical with "magic" number of nucleons, for example, *Xe*(999) and *Kr*(99), but then the sum α-particles will be 45, therefore, instead of *Kr*(99) (any change "ideal" nucleus *Xe* it does not pay), *Sr*(991) should be formed. Confirming following the quotation.

"In reality the experiment demonstrates, that at dividing nuclei of uranium the neutrons, as a rule, will forms debris of unequal value. About 95 % of debris have mass numbers lying in limits from 85 up to 105 and from 130 up to 150, and the debris formation is most possible, the mass numbers which one lie in the middle of these intervals, i.e. debris, which one represent nuclei of isotopes strontium $_{38}Sr^{95}$ and xenon $_{54}Xe^{139}$". G.E. Pustovalov, Atomic and nuclear physics, The Moscow University, 1968, page 295-296.

In this connection it is represented to rather possible decay of very unstable nuclei with formation (except for a proton and α-particle) such high symmetrical of nuclei, as carbon, oxygen (fig. 5) and neon (fig. 6): "At analysis of nuclei far from area of stability the new types of radioactive decay are detected: emitting of protons, C^{12}, C^{14}, O^{16}, Ne^{20} from ground states of nuclei". Subatomic physics, The Moscow University, 1994, page 45. One of ways of obtaining of an atomic energy can be grounded on shear of high-gravity nuclei. At shear of nuclei on α-planes the not spherical debris will be formed, which one fast receive the spherical form, thus the huge energy much more superior energy, expended on shear is selected.

For *No* the capabilities for enlargement of a nucleus practically are depleted not only because of α-radioactivity, but also on geometrical reasons, since the nucleus *No* practically is precisely inscribed in a sphere. The sizes of nuclei almost precisely correspond to the sizes computed on the known formulas. Though in nuclei also there are no close shells of protons or neutrons, nevertheless, the indicated structure of nuclei completely corresponds to so-called "magic" numbers of nucleons in the steadiest nuclei. It is understandable, that the most unstable nuclei will be in a start of formation new α-planes, with incomplete α-particles and after the steadiest nuclei:

Y (*Kr*+1,5α) *La* (*Xe*+1,5α) *At* (*Pb*+1,5α)
Nb (*Kr*+2,5α) *Pr* (*Xe*+2,5α) *Fr* (*Pb*+2,5α)
Tc (*Kr*+3,5α) *Pm* (*Xe*+3,5α) *Ac* (*Pb*+3,5α)

From here are directly received "magic numbers of instability" of nuclei with number of protons in them: 39, 41, 43, 57, 59, 61, 85, 87, 89. This series is easy for prolonging in both sides. Though we for the first time mark "magic numbers of instability", following to an example of official science, we shall put and "magic numbers of stability". For protons they are directly received from the constitution of nuclei with completely formed α-planes: 2(α-particle), 8(*O*), 10(*Ne*), 20(*Ca*), 28(*Ni*), 36(*Kr*), 46(*Pd*), 50(*Sn*), 54(*Xe*), 64(*Gd*), 74(*W*), 78(*Pt*), 82(*Pb*), 92(*U*), 102(*No*). A little independently stands a nucleus $_{14}Si^{28}$ (151) in which one to a plane from 5 α-particles from two sides adjoin on one, forming a symmetrical nucleus, which one, as well as all listed, because of the symmetry has smaller potential energy, than adjacent nuclei. "Magic numbers" of neutrons are received also outgoing from a constitution of nuclei, and, they are secondary in relation to numbers of protons. For example, the isotope $_{54}Xe^{136}$ has three α-planes with completely filled vacant places of neutrons, therefore one of "magic" numbers of neutrons will be: 136-54=82. Thus it is necessary to mean, that the outcome of calculus should correspond and formula to β-stability of a nucleus (see below). Thus, "magic" numbers of any relation to nuclear shells, which one are not present, have not. "Are specially steady those nuclei, for which one (at *Z*=*N*); *Z*=2; 8; 20 (doubly "magic numbers") or *Z*=28; 50; 82 and *N*=50, 82, 126 ("magic" numbers)". N.I. Kariakin etc., Brief reference book on physics, "Higher School", M., 1962, page 422. Pay attention that all nuclei with "magic" numbers of nucleons are symmetrical, therefore and are strong. "The elements with a magic number of nucleons have close to zero point the quadrupole moment that speaks about symmetry of these nuclei". Ibidem, page 426.

The process of internal conversion, when the exited nucleus beams a photon occluded by the proximate orbital electron, confirms an earlier considered capability of full disappearance of a photon. "Internal conversion - process of transition of a nucleus of a condition with the greater energy E_i in a condition with smaller energy E_f by transmission of excess of energy directly to one of electrons of a atomic shell. The electron becomes free, if the energy E_i - E_f imparted to it exceeds its bond energy B_e. The process of internal conversion implements without participation of a substantial photon (with participation of "virtual" photons - V.K.). Energy is transmitted to an electron by a nucleus mainly at the expense of a Coulomb interaction". Subatomic physics. The Moscow University, 1994, page 56. Here we again remark, that the official notions outgo from an allowance that proximate to a nucleus an electron and nucleus are mutually informed on a condition each other. The Coulomb interaction with a nucleus should swallow an electron, instead of to throw out it from atom.

Thus, the nuclei of all atoms inside practically are identical also their properties basically determines surface layer, in which one the main role is played by the "undeveloped" alpha-particles, i.e. definite places of a surface of a nucleus. This fact opens a potential of control both speed of decay by means of "vaccinations" and direction of a radioactive radiation by means of dimensional orientation of nuclei.

By taking advantage energies of connection of nuclei for H^3 – 8.49 MeV, He^3 – 7.72 MeV and He^4 – 28.3 MeV, it is possible to find spacing interval between protons in He^3 considering, that energy of repulsing between protons 8.49-7.72 = 0.77 MeV. This spacing interval makes $1.9 \cdot 10^{-13}$ cm (Data are taken from the book: B.M. Javorsky, A.A. Detlaph, Course of physics, M., 1967, v.3, page 414). On a figure 9 the particles of a figure 2 are to scale figured. The dotted line indicates an axis of a torus, diameter it 1.9 fm. Radius of a proton 0.631 fm, radius of a neutron (proton

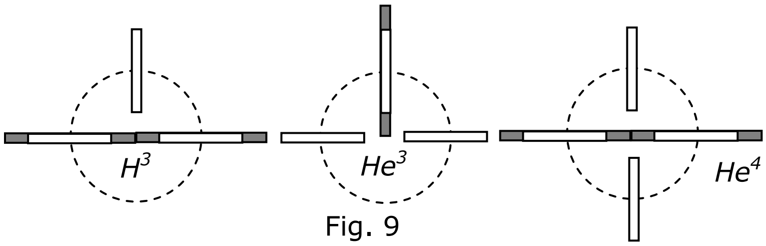


Fig. 9

with a dark ring figuring an electron) 0.986 fm. As we see, all sizes corresponds each other. Radius α-particle will be peer to diameter of a neutron 1.972 fm, under the literary data (Physics of a microcosmos, M., 1980, page 499) it is peer ~2 fm. Under the same data density of number of nucleons inside a nucleus is identical and is peer, approximately, $1.68 \cdot 10^{38}$ nucleons/cm^3, and thickness of surface layer for all nuclei 1.5-2 fm. Accordingly, density of nucleons inside a nucleus will be $1,25 \cdot 10^{38}$ nucleons/cm^3

This value corresponds to diameter of neutrons, the excess which one is displaced on a surface. The volume α-particle is peer $3.2106 \cdot 10^{-38}$ cm^3. Density of internal area of a nucleus consisting from of α-particles will be received equal $2.07 \cdot 10^{14}$ g/cm^3 (under the literary data B.M. Javorsky, A.A. Detlaph, Course of physics, M., 1967, v.3, page 419) the nuclear density makes ~$1.3 \cdot 10^{14}$ g/cm^3. Accordingly, density of nucleons inside a nucleus will be $1.25 \cdot 10^{38}$ nucleons/cm^3. Thus, the calculations prove the previous reason.

It is possible to take advantage by the data on bond energy at formation of α-particle for approximate calculation of bond energy (on one nucleon) any nuclei. A tendered computational method we shall demonstrate on an example of the evidence, that the nucleus $_{28}Ni^{58}$ is steadiest of all nuclei, since for it maximum bond energy on one nucleon. It is possible to suspect at once, that the candidate for the steadiest nucleus will be one of a series: *Ca*(55), *Ni*(77), *Kr*(99). The more light nuclei of a symmetrical constitution have not enough of internal bonds of nucleones, and for the more high-gravity bond energy on one nucleon decreases for two reasons: 1. increasing quantity of exuberant neutrons practically does not introduce additional bond energy, since they will not formed new α-particles, therefore it in calculation on one nucleon decreases. 2. The coulomb repulsion of protons makes high-gravity nuclei unstable.

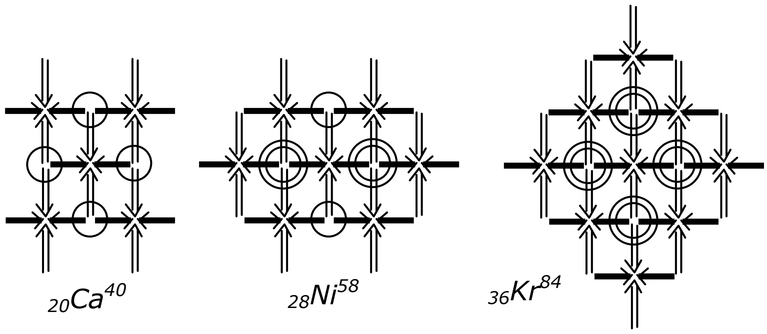


Fig. 10

The indicated nuclei have till two completely identical α-planes; therefore we shall esteem only one as a matter of convenience. These planes are figured on a figure 12.10. For Ca^{40} the exuberant neutrons are not present, therefore number of nucleons in a plane is equal 20. Energy of connection of a nucleus will be peer to the sum of energies of connection 5 α-particles a plus of bond energy two of H^3 and two of He^3 (are indicated on a figure 10 by circles).

From this sum it is necessary to take away energy of repulsing, coming on one proton (0.77 MeV), multiplied on number of protons. Thus we take into account repulsing the given proton from the proximate neighbour and neglect interplay with other protons. By divided on number of nucleons in a plane (20), we shall discover bond energy on one nucleon E_0. Thus: E_0 = (5·28.3 +2·8.49 +2·7.72 -10·0.77) :20 =8.31 MeV. For Ni^{58} two exuberant neutrons, one of which belongs to shown on a figure to a α-plane (is not shown), therefore number of nucleons in it will be 29. In common balance will include bond energy two of He^3 and two additional α-particles (are indicated by a double circle). Thus: E_0 =(9·28.3 +2·7.72 -14·0.77) :29 =8.94 MeV. For Kr^{84} 12 exuberant neutrons, 6 of them belong to figured to a α-plane (are not shown), therefore number of nucleons in it will be 42. Therefore E_0= (13·28.3 -18·0.77) :42 =8.42 MeV. The more precise mathematical calculations of additional comprehension will not give, but strongly will block up presentation. Thus, we have shown that represent α- particles and as they reshape nuclei of atoms.

On a figure 12.11 the graph of change of bond energy in MeV on one affixed neutron is shown depending on number of neutrons in a nucleus. The nuclei from *He* up to *Ne* with an even number of protons are shown a continuous line, and with odd number of protons - dashed. *He* and *Li* will be formed on one α-particles, *Be* and *B* in light isotopes have on one α-particles and in process of supplement of neutrons will forms second a α-particle. *C* and *N* in light isotopes have on one the α-particles and in process of supplement of neutrons will forms second and third α-particles. *O* and *F* in light isotopes have on two the α-particles and in process of supplement of neutrons will forms third and fourth α-particles. *Ne* in light isotopes has three α-particles and in process of supplement of neutrons will forms fourth and fifth α-particles. The figure 11 serves convincing endorsement of formation α-particles in a nucleus. The pairing of neutrons gives a noticeable scoring in bond energy because of formation of structure, in the inferior case, similar H^3 and, at its best, similar He^4. The common decrease of curves with increase of number of neutrons is conditioned by that first of all neutrons are built into places most expedient energetically.

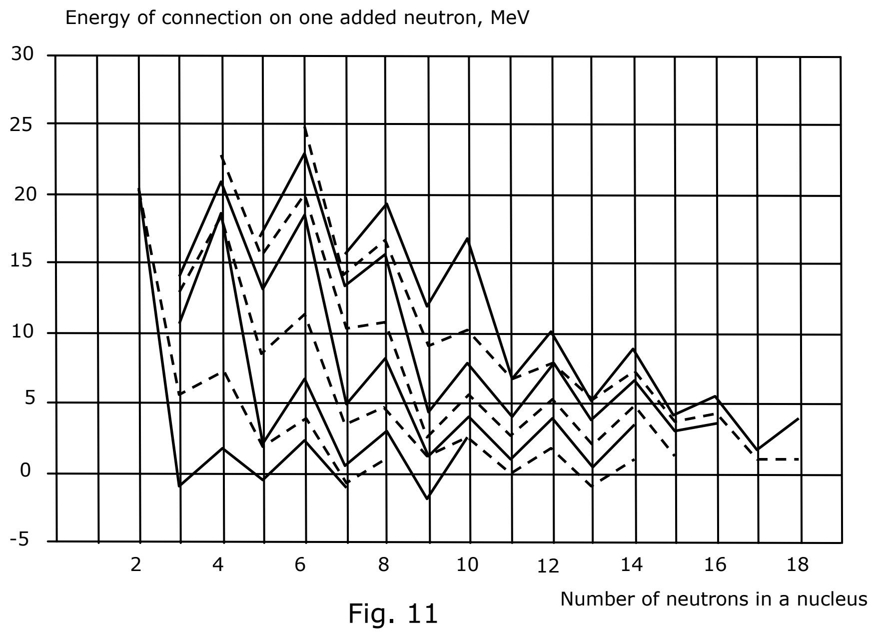


Fig. 11

On β-DECAY of NUCLEI

Before to begin talk about β-decay of nuclei, it is necessary a little words to tell about a temperature balance of systems. Our classic notions about heat transfer and temperature balance in insulated systems do not cause doubts so long as we are at a atomic-molecular level. At transition to systems of other level we at once are convinced that a temperature balance between these systems is not present and can not.

Let's consider some examples. Energy of interplay of particles at heat transfer at a atomic-molecular level makes of the order 0.1 eV, at the same time electrostatic energy of electrons with a nucleus makes the order 100 eV, that corresponds to "temperature" of a system of electrons around of a nucleus about one million grades. Naturally, that about "thermal" equilibrium of a system of atomic electrons and atoms, as separate particles can not be speech; otherwise atoms to exist can not. Passing on a level of atomic nuclei representing as though a solid, in points of lattice which one there are α-particles, we simultaneously transfer to interplays, order 10 MeV or "temperature" of nuclei of atoms 10^{11} ^0K. And, at last, passing on a level a neutrino components nucleons, with an interplay energy, order 100 MeV, their "temperature" will make 10^{12} ^0K. To the indicated levels it is possible to add and macrolevels: a planetary system of a star, galaxy. Apparently, that of heat change between all listed levels can not is would result in automatic disappearance of all levels, as takes place periodically at a collapse of the Universe (see chapter about a collapse), therefore, the laws of a thermodynamics are unsuitable for the description of all levels jointly. Nay, such levels, as a level a neutrino, level of an electronic system of atoms and macrolevels qualitatively differ from levels of atomic-molecular and nuclear, what even inside these levels "temperature" of each member its and "heat change" is impossible because of order of motion of components it, i.e. the thermodynamics is inapplicable and to each of these levels separately. Here it is necessary to note, that somewhat, the exchange of energy components macrolevels is possible because of dissipative processes in a macroworld, therefore macrolevels for the existence require a constant replenishment by energy (see chapter about a constitution and formation of a solar System). The nuclear level, interesting for us now, is similar atomic-molecular in sense of a capability interchange of energy inside a nucleus and applying of the thermodynamic laws for the description of nuclear processes. This circumstance allows taking advantage used to perfection of the mathematical apparatus of thermodynamics, in particular, depicting a chemical equilibrium.

"The nuclear reactions by a native born image differ from chemical reactions, at which one atomic nucleus remains invariable, and in process assists only external the electrons of atoms. Nevertheless, on nuclear changes can be applied of regularity and equation of a chemical thermodynamics, as the thermodynamics in the basis not related with definite notions about structure and properties of separate particles. Regularity of a chemical thermodynamics therefore apply to transformations of substances interacting in stoichiometric quantities, even these transformations had not chemical nature". J.I. Gerasimov etc., Course of physical chemistry. The chemical literature, M., 1963, volume 1, page 343.

Such powerful means of research as a thermodynamics is obviously underrated by a modern physics of a nucleus for the description of nuclear processes for two reasons: 1. Physicists are connected by the particular quantum laws invented by them for a microcosmos. In particular, on their notions of nucleons have a half-integer spin and obey to a Pauli exclusion principle (fermions) - each nucleon of a nucleus "knows" all about members of a nucleus to be in condition, distinguished from them, at the same time, the thermodynamics guesses, that all members of a thermodynamic system are "bosons", i.e. "independent" from each other particles. 2. The narrow specialization of the scientists urges by a thermodynamics to be engaged of the physicists-chemists and chemists, but not physicists - nuclear engineering. Honestly speaking, physicists it is not necessary to permit in a thermodynamics, that there not tell a fib it is a lot of superfluous.

Allowing high "temperature" of nucleons in a nucleus, it is represented apparent, that at their impacts of energy it is enough both for formation of pairs a neutrino - antineutrino, and for formation electronic - positron of pairs. In a result in a nucleus some equilibrium concentration of electrons and positrons, as a consequent of following processes is established (without the registration a neutrino):

$$e^+ + e^- \leftrightarrow \pi^0 \quad K_1 = \frac{[\pi^0]}{[e^+]\cdot[e^-]} \tag{1}$$

$$e^+ + e^- \leftrightarrow 2\gamma \quad K_2 = \frac{[\gamma]^2}{[e^+]\cdot[e^-]} \tag{2}$$

$$e^+ + n \leftrightarrow \Sigma^+ \quad K_3 = \frac{[\Sigma^+]}{[e^+]\cdot[n]} \tag{3}$$

$$e^- + P \leftrightarrow n \quad K_4 = \frac{[n]}{[e^-]\cdot[P]} \tag{4}$$

$$\pi^0 + P \leftrightarrow \Sigma^+ \quad K_5 = \frac{[\Sigma^+]}{[\pi^0]\cdot[P]} \tag{5}.$$

Here it is necessary to point out, that all particles, participating in these processes, are inside a nucleus, i.e. in strong external gravidynamic fields, therefore their properties in a large degree differ from properties of free particles. The equilibrium constant K_3 allows also for electron capture, but it does not influence final conclusions for the reason, that the same number proximate to a nucleus of electrons participates in this process without dependence from nuclear charge. At increase of nucleus charge the equilibrium concentration of electrons decreases as a result of displacement of equilibrium (4) to the right, thus the equilibrium concentration of positrons grows, and at increase of number of neutrons in a nucleus the positrons are linked as a result of displacement of equilibrium of process (3) to the right and thus the equilibrium concentration of electrons grows. The increase of equilibrium concentration of positrons or electrons takes place as a result of displacement of equilibrium of processes (1) and (2) to the left. Therefore, at definite quantity α-particles in a nucleus, it will be by steadiest only at definite quantity of exuberant neutrons. At the same time some range β-steady nuclei on both sides of such steadiest nucleus is possible, as for some range of exuberant neutrons at definite Z, and at the same quantity of exuberant neutrons - for some range α-particles composes the nucleus. The range width is proportional to a depth of potential wells the steadiest nucleus. The range width α-particles, at definite quantity of exuberant neutrons (odd), for nuclei with odd Z can appear to equal zero point. In this case nucleus releases simultaneously β^+ and β^- radiation. Apparently, that by steadiest (optimal on a structure) the nucleus will be in that case, when $[e^+] = [e^-]$, i.e. the concentration of "free" electrons and positrons in a nucleus will be minimum, therefore we shall search for ratio: $\frac{[e^-]}{[e^+]} = 1$.

From (3): $$\left[e^{+}\right]=\frac{\left[\Sigma^{+}\right]}{[n]K_{3}} \quad (6),$$

From (4): $$\left[e^{-}\right]=\frac{[n]}{[P]K_{4}} \quad (7),$$

From (5): $$\left[\Sigma^{+}\right]=\left[\pi^{0}\right][P]K_{5} \quad (8).$$

Let's substitute (8) in (6):

$$\left[e^{+}\right]=\frac{\left[\pi^{0}\right][P]K_{5}}{[n]K_{3}} \quad (9).$$

From (7) and (9):

$$\frac{\left[e^{-}\right]}{\left[e^{+}\right]}=1=\frac{[n]^{2}K_{3}}{[P]^{2}\left[\pi^{0}\right]K_{4}K_{5}} \quad (10).$$

From (10): $$\frac{[n]}{[P]}=K\sqrt{\left[\pi^{0}\right]} \quad (11).$$

The common sense suggests, that, as a first approximation, $\left[\pi^{0}\right]$ will be proportional to number of nucleons in a nucleus. Orthodox physics also recognizes existence of pions in a nucleus, truth, for other reasons: "Owing to an energy conservation law these particles are retained "confine", in a nucleus, so long as from the outside will not arrives energy superior mc^2 (*m* - mass of particles)". Fundamental structure of a matter. "World", M., 1984, page 84.

Then (11) it is possible to copy as follows:

$$\frac{n}{P}=C+B\sqrt{A} \quad (12).$$

Thus the change of equilibrium constants and $\left[\pi^{0}\right]$, certainly, will depend on a concrete constitution of a nucleus, but is effect of the second order. Apparently, that for high-gravity nuclei the relation (12) will not be executed, at first, that the probability of formation π^0 will not depend any more on number of nucleons in a nucleus and, secondly, that the number of nucleons on a surface of a nucleus will make the lesser fraction from a total number of nucleons in a nucleus, and inside a nucleus ratio *n/P*=1. Therefore, the ratio *n/P* in real nuclei in the beginning is augmented up to values 1.58, and then drops (after $_{96}Cm^{247}$) in a limit aiming to 1. This conclusion is useful to us at arguing the different scripts of a collapse and capability of existence neutron macrobodies. As the exuberant neutrons place on a surface of a nucleus, which one grows slower, than volume, for super high-gravity nuclei the geometrical reasons require aiming to unit of ratio of number of protons to neutrons, and thermodynamic the followings to the formula β-stability of nuclei require, on which one the number of exuberant neutrons should progressive accrue. This conflicting is depleted by the compromise on a nucleus of uranium, therefore hopes of the scientists to find "an island of stability" in transuranium nuclei are illusive so long as we shall not learn to do flat or linear nuclei, to that the coulomb repulsion of protons favors, but hinders short-range and strong gravidynamic interplay.

That clear to see, what isotopes of elements have a structure of nuclei near to optimal, is convenient all known isotopes of elements to present as two similar tables. In one table in maiden column is the integer α- particles composes nucleus this correspond elements with an even number of protons in a nucleus. In the subsequent columns the isotopes with 1, 2, 3 etc. exuberant concerning an integer α-particles by neutrons is placed. Thus, all isotopes of each element with even *Z* in this table take definite string. Other table is built similarly, the difference only that in maiden column is an integer α-particles, including one unfinished, i.e. with lack of one proton - to this there correspond elements with odd number of protons. These tables give a very clear picture of properties of nuclei. All steady isotopes of elements take definite range in columns, is higher than which one placed the β^- radioactive isotopes (nuclear charge - is too small, at the given number of exuberant neutrons), and below placed β^+ radioactive isotopes (charge of nuclei is too great at the same number of exuberant neutrons). In the tables influencing parity of charges of nuclei and parity of exuberant neutrons on strength of nuclei and, therefore, their stability to β-radioactivity is very brightly exhibited. These tables in view of them crockhood here are not resulted.

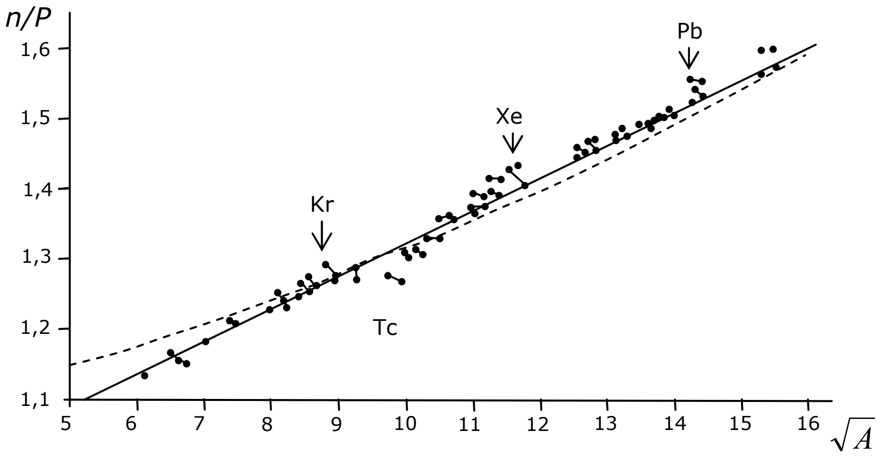


Fig. 12

From the formula (12) it is visible, that with increase of number of nucleons in a nucleus, the number of exuberant neutrons should progressive increase to keep β-stability of nuclei. Therefore exuberant neutrons break all in the greater degree a surface of a nucleus, that results in sharp reduction of ranges of steady nuclei, with increase of number of nucleons in a nucleus, up to such degree, that in high-gravity nuclei preferential there is a α-radioactivity even for nuclei many neutrons of a relatively optimal structure (prime cause it, certainly, is the strongly increasing repulsing α- particles because of electrostatic interplay with a nucleus as a whole). From the same tables the isotopes are well visible, the nuclei which one are optimum or are close to this: it is isotopes with the steady nucleus which has appeared in columns in loneliness, ranges consisting all of two steady isotopes, isotopes, the contents which makes one 100 % any of a element in natural conditions, and also isotopes with simultaneous $\beta^+\beta^-$-radioactivity (one or two in column). All these isotopes are marked on a figure 12 in coordinates: $\sqrt{A}$ - *n/P* and are enough well stacked on straight line that confirms a validity of the formula (12). The pairs of isotopes relating one column of the tables are connected by a section of a straight line. As expected, the points are not precisely stacked on a straight line, and will forms a little convex upwards of curves, the fractures which one correspond maximum and minimum to steady nuclei, i.e. the inner structure of nuclei is appreciable.

Equation of a straight line of fig. 12:

$$\frac{n}{P} = 0.836 + 0.0473\sqrt{A} \qquad (13).$$

It is interesting to determine, at what values *A* ratio *n/P*<1, i.e. the optimal structure of nuclei will contain excess of protons in matching with neutrons. By equating (13) unit, we shall discover: *n/P*<1 at *A*<12. The established property of nuclei should be exhibited for odd nuclei stronger, since the strength them is significant less. It also explains stability only of four known odd-odd nuclei: $_7N^{14}$, $_5B^{10}$, $_3Li^6$, $_1H^2$. Nay, becomes understandable β^--radioactivity of tritium and stability of an alone nucleus, for which one the number of protons exceeds number of neutrons (except for a protium) $_2He^3$, though the abundance of this isotope of helium is insignificant, since the closing of a gravidynamic field inside a torus $_2He^4$ is much more expedient energetically.

The ratio between neutrons and protons for steady nuclei is known from semi empirical expression of drip model of a nucleus:

$$Z_{stab} = \frac{A}{1.98 + 0.015A^{2/3}} \qquad (14).$$

Substituting in numerator *A=P+n* and converting, we shall discover:

$$\frac{n}{P} = 0.98 + 0.015A^{2/3} \qquad (15).$$

The curve (15) is marked by a dotted line on the graph of a figure 12, whence it is visible, that the known formula mirrors a substantial situation worse, than tendered (13). The condition *n/P* <1 will be executed for (15) at *A*<1.5, i.e. is not executed for any known isotopes, except for $_1H^1$, but it not on account of, since the separate proton has nobody to interchange energy. Therefore (15) does not explain stability $_2He^3$ in matching with $_1H^3$. Other equations practically which are not distinguished from reduced, for example are known also: $Z = \frac{A}{2 + 0.0146A^{1/3}}$. (N.I. Kariakin etc., Brief reference book on physics. "Higher School", M., 1962, page 422).

ON an ELECTRON CAPTURE, NEUTRON and α-DECAY

The mechanism of an electron capture on the basis of above-stated becomes clear. It is conditioned by thermodynamic necessity to form a steadier nucleus, compensated an excess concentration of positrons, and, in the principled schedule has not value whether there is it at the expense of emitting a positron or electron-capture from the proximate environment of a nucleus, the selection depends only on power profitability. If for the β^--decay is not present alternative, the electron capture has advantage before emitting of positrons for the reason what to capture proximate to a nucleus an electron is more expedient because of electrostatic and of gravidynamic attraction to a nucleus, while the positron should pass some spacing interval inside a nucleus, risking to be bound in processes (1), (2), (3), thus not interacting in any way with it electrostatic and besides to overcome a barrier of gravidynamic attraction on escaping of a nucleus (work function). Therefore $\beta^{\pm}$ decay in the pure state we is observed only for nuclei, on a structure far from optimal, i.e. with a high excess concentration of electrons or positrons.

"Actually electron-capture by a nucleus, certainly, does not take place. The transformation of a proton in a neutron in a nucleus is accompanied by simultaneous disappearance of an electron on to *K*-shell". B.M. Javorsky, A.A. Detlaph, Course of physics. "Higher School", M., 1967, page 461. The "fantastical" disappearance of an electron at transformation of a proton in a neutron is a consequent deeply of error original notions of orthodox physics tangent of a microcosmos.

The formula (13) it is possible to satisfy, i.e. to result a neutron-proton structure of a nucleus to optimal not only by β decay or electron capture, but also emitting of exuberant neutrons and α-particles, but not of protons, as the "superfluous" protons in a nucleus are not present (behind exception "unfinished" α-particles), all of them enter in a structure α-particles, which one to shatter very difficultly. At emitting a neutron the ratio *n/P* decreases directly, and at emitting α-particle this relation is as a matter of fact augmented at the expense of exuberant neutrons in a nucleus, in spite of the fact that in itself α-particle relation *n/P*=1. Naturally, that neutron and α-decay will be watched only at maximum deviation of a structure of a nucleus from optimal, since "rip out" them from a nuclear grating not so it is simple. The α-decay represents almost full analogy to vaporization of a molecule from a solid surface, taking into account that "latent heat of vaporization" for each isotope its and is determined by a degree loosened of a surface of a nucleus by exuberant neutrons and other factors influencing in strength of a nucleus. Therefore "for some elements are watched so-called the long-range α-particles having quite definite, but large energy, than bulk α-particles. The presence of such particles is explained to that before α-decay the α-particle can receive additional energy" (N.I. Kariakin etc., Brief reference book on physics. "Higher School", M., 1962, page 460). To this it is necessary only to add, that, on presentation of new physics, the long-range α-particles "evaporate" from that place α-planes, where "latent heat of vaporization" them is more, and additional energy these particles receive at the expense of Boltzmann's an energy distribution among nucleons.

Therefore law of Geiger-Nettol for α-decay is similar to the law of Klausius-Klapeiron for a saturated steam pressure in temperature dependence. With increase of nuclear charge "latent heat of vaporization" α-particles decreases because of a coulomb repulsion up to such degree, that for transuranium elements the α-decay is overwhelming in a competition with β^+-decay and electron capture.

"Geiger and Nettol have established the very relevant ratio between energies *E* α-particles and half-value periods. Usually it express as connection between run and decay constant: $lgR = Alg\lambda + B$. (Here *R* - run α-particle, and λ - decay constant - reverse value of a life time - V.K.). The constant *A*, determining a slope of a straight line in coordinates (*lgR*, *lg*λ), has practically same value for all three radioactive series. "*B*" has different values for different series. The law of Geiger-Nettol demonstrates, that the nuclei releasing a α-particles with the greater energy, should have a smaller half-life, thus the small difference in energies should result in to very large difference in half-life". N.I. Kariakin etc., Brief reference book on physics. "Higher School", M., 1962, page 458.

As "latent heat of vaporization" α-particle strongly depends from constitution of a nucleus the same as also latent heat of vaporization of molecules of substance from temperature, most eligible for matching will be equation Klausius-Klapeiron as:

$\ln p_2 = \frac{\lambda_2}{\lambda_1} \cdot \frac{T_{1cr}}{T_{2cr}} \ln p_1 + c = A \ln p_1 + c$, where p_2 - saturated steam pressure of the second liquid, p_1 - saturated steam pressure of the maiden liquid, λ_2 and λ_1 - applicable latent heat of vaporization, $T_{1,cr}$ and $T_{2,cr}$ - applicable critical temperatures, *c* - constant for the given pair of liquids (J.I. Gerasimov etc., Course of physical chemistry. M., 1963, page 153). Here, as well as in the law of Geiger-Nettol the constant *A* has practically same value (if "maiden" - liquid of matching - same), and the constant "*c*" depends on properties of the second liquid.

The decay of some isotopes of light members contradicts the above-stated reasons. However this inconsistency apparent also is conditioned by structural features of these isotopes. Let's consider all these cases. The decay $_4Be^8$ on two α-particles was reviewed earlier and is conditioned by that at two α-particles the cleavage of a gravidynamic flow cannot be executed, therefore field remains inside α-particles and they practically do not interact with each other, except for a coulomb repulsion (is similar to atoms of inert gases). The decay $_2He^5$ on a neutron and α-particle is conditioned by that this nucleus very much far from an optimal structure (*n/P*=1.5, and under the formula (13) should be *n/P*=0.94), therefore nucleus should release a neutron and there is remains a α-particle. Decay $_6C^9$: β^+, *P,* 2α is conditioned by that this nucleus very much far from an optimal structure (*n/P*=0.5, and under the formula (13) should be *n/P*=0.98), therefore nucleus should release a positron, and the neutron, which has appeared from a proton, completes formation second α-particle. The complex $_4Be^8+P$ will be formed, which one and is disintegrated on a proton and two α-particle. Decay $_3Li^6$: β^-, 2α is conditioned also by large deviation from an optimal structure of a nucleus (*n/P*=1.7, and under the formula (13) there should be *n/P*=0.97), therefore nucleus should release an electron with formation again $_4Be^8$. Decay: $_5B^8$: β^+, 2α also goes through $_4Be^8$ (*n/P*=0.6, and it is necessary 0.97). In a series of isotopes with $\beta^+\alpha$-decay: $_7N^{12}$, $_{11}Na^{20}$, $_{13}Al^{24}$, $_{17}Cl^{32}$ all of them have sequentially increased deviation from an optimal structure in the side of excess of protons, therefore, β^+-radioactive. Besides everyone α-particle is capable to incorporate with others having, as a minimum three a nucleon in the connector node, therefore for $_7N^{12}$ in general there is no whole α-particle, and for $_{17}Cl^{32}$ on 5 whole α-particles it is necessary 4 non-integral (with three nucleons), therefore indicated isotopes have a maximum loose structure from all possible nuclei, because of what the α-decay them competes with β^+-decay. These examples deplete apparent deviations of decays of some isotopes from the theory.

From a constitution of nuclei, introduced in a start of this chapter and theory β-decay appear principled impossibility of formation of nuclei from one neutrons or nuclei of hydrogen inclusive more of two neutrons (tritium), since the neutrons in these cases are no place "to affix". "Though the nuclear interaction in a singlet state is unsufficiently great to forms a bineutron, it does not eliminate a capability of formation of a bound system consisting of large number one only of neutrons - of neutron nuclei. This problem requires further theoretical and experimental analysis. Attempts to find out on experiment of a nuclei from three-four neutrons, and also the nuclei H^4, H^5, H^6 have not given while positive results". Physics of microcosmos. "Soviet encyclopedia", M., 1980, page 284. Formations of nuclei from neutrons need huge pressure conditioned by a gravitation.

But here there is one extremely interesting opposition. As Λ-hyperon (see of fig. 9.6.2.1 in chapter 9.6.2 [1]) is "neutron", in which one on orbit around of a proton there is not an electron, and π^--meson, the gravidynamic connection which one with a proton is much stronger, than electron, is possible the formation "hyperon of an alpha-particle" in which one Λ-hyperon takes a position of the second proton. A structure of this particle: a proton two neutrons and Λ-hyperon, i.e. H^4. Thus the connection of two protons implements by π^--

meson as an one-electron bond in molecules (see types of a chemical bond). Thus, the hyperons in a nucleus allow speaking about "molecular chemistry" of nucleus and further researches in this area will cause to most interesting outcomes. "Energy of connection of a hyperon in a nucleus of tritium is very small - only 0.06 MeV, in an isotope of hydrogen $_{\Lambda}H^4$ it makes 2 MeV (isotope of hydrogen H^4, consisting from one proton and three neutrons, in the nature does not exist)". Physics of microcosmos. "Soviet encyclopedia", M., 1980, page 506.

It is necessary to make one critical remark tangent logic errors in the known theories β and α-decay. Decay of nuclei explains to that as a result of decay the steadier nuclei will be formed, i.e. the process energetically is expedient. Thus, as propulsion of decay as a matter of fact consider "knowledge" by a nucleus of the future destiny, than it, ostensibly, and is guided. Apparently, that the reason of decay lies not outside of, and inside a nucleus and the spontaneous formation of a steadier nucleus is not a reason, and consequent of decay.

As is known, the classic notions can not explain α-decay, since radiated the α-particle, for example, for $_{92}U^{238}$ has energy equal 4.18 MeV, which one it could gain, moving from a nucleus from spacing interval not less than 45 fm, and the radiation of a nucleus of uranium α-particles with energy 8.8 MeV demonstrates dissipation under operating of Coulomb forces, i.e. the altitude of a potential electrostatic barrier makes 8.8 MeV, that corresponds to spacing interval from a nucleus 30 fm. For explanation of this paradox the "tunnel" effect (only wave property "of particles") is attracted, but if to be up to the end consequent, the "tunnel" effect, basically, negates stable existence of any systems in a microcosmos, starting from atoms and finishing by "elementary" particles, if they consist of something. As a matter of fact is a denying of existence of our world in its any forms. If to take into account, that "evaporating" from a nucleus the α-particle should receive kinetic energy lengthwise axis screw line and same energy on coils of a screw line (experimentally we institute only energy translational component, and tangential component is not fixed). Besides the nucleus at recoil receives energy, both on an axis, and on coils of a screw line and all this at the expense of electrostatic energy of repulsing. If to take into account all this, all becomes on the places without "tunnel" effect.

"The passing of particles through a potential barrier explains a lot of phenomena: an external contact potential difference at a contact of heterogeneous conductors, cold emission of electrons (emitting of electrons from a surface of a conductor at an electric field strength near to this surface more than ~100 keV/cm), some features of nuclear reactions, α-decay of nuclei etc". G.E. Pustovalov. Atomic and nuclear physics. The Moscow university, 1968, page 61. Leaves, the official science asserts, that steady formations in a microcosmos in essence can not be. There is also other inconsistency: as the quantum mechanics esteems a particle, as a wave, which one is mirrored from two walls of a barrier, the part of "particle" will return back, the part will stick inside a barrier, and the part will pass through a barrier. So, where there will be particle? The answer is given in chapter 3.4 [1].

Apparently, that the nuclei of radioactive elements releasing α-radiation with a very large half-life will reject α-particles with energy, almost in accuracy to the applicable depth of potential well, in which one they are in a nucleus, i.e. their kinetic energy on top of a potential barrier appears to equal zero point. Energy α-particles radiated such nuclei is minimum. Value of electrostatic energy:

$$E_{el} = \frac{(Z-2)2e^2}{R} \quad (16).$$

The same energy is spent for motion of a nucleus of recoil and α-particle on screw lines:

$$E_{el} = 2E_\alpha + 2E_{A-\alpha} = 4V_\alpha^2 + (A-4)V_{A-\alpha}^2 \quad (17).$$

Allowing, that on a law of conservation of momentum:

$$4V_\alpha = (A-4)V_{A-\alpha}, \text{ whence: } V_{A-\alpha} = \frac{4V_\alpha}{A-4} \quad (18)$$

and substituting (18) in (17), we shall discover:

$$E_{el} = 2E_\alpha\left(1+\frac{4}{A-4}\right) \quad (19).$$

By substituting (19) in (16), we shall receive:

$$R = \frac{(Z-2)e^2}{\left(1+\frac{4}{A-4}\right)E_\alpha} \quad (20).$$

By substituting in (20) values of constants, we shall receive a calculating formula:

$$R_{(fm)} = 1.44\frac{(Z-2)}{\left(1+\frac{4}{A-4}\right)E_\alpha} \quad (E_\alpha\text{-MeV}) \quad (21).$$

The calculation under the formula (21) gives values *R*, indicated in table 1. By substituting these values *R* in (16), we shall discover value of a potential barrier E_p also indicated in the table.

Table 1.

Isotope	R(fm)	E_α (MeV)	E_p (MeV)
$_{92}U^{238}$	30.5	4.18	8.5
$_{58}Ce^{142}$	52.2	1.5	3.1
$_{60}Nd^{144}$	45.1	1.8	3.7
$_{62}Sm^{146}$	33.0	2.55	5.2
$_{62}Sm^{147}$	38.5	2.18	4.5
$_{4}Be^{8}$	28.8	0.05	0.2

From the table is visible the coincidence for $_{92}U^{238}$ of the experimental and theoretical data and inconsistency of "tunnel" effect. In this connection, it is necessary to allow for that circumstance, that at occluding by a nucleus of any particle, it introduces to a nucleus energy, equal its doubled translational energy. Therefore, positively charged translating particle having energy, approximately, twice is less than a potential barrier easily falls in a nucleus, demonstrating again "tunnel" effect. Thus the proper rotation of a particle also is transmitted to a nucleus as a whole, since a particle inside a nucleus to be gyrated can not. Therefore above-stated calculations require elaboration strengthening "tunnel" effect.

The above-stated calculations allow, not knowing an analytical view of a curve of gravidynamic attraction, to construct the provisional graph of change of potential energy depending on spacing interval from a nucleus. Such graph is adduced on a figure 13 for $_{92}U^{238}$ at interplay with a α-particle.

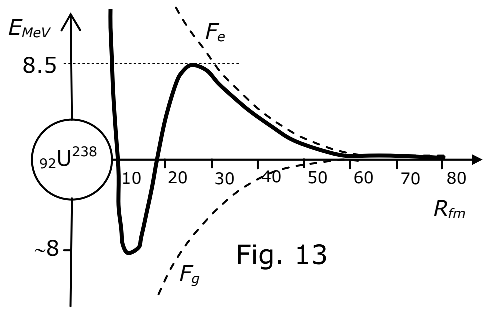


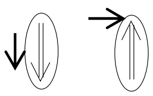
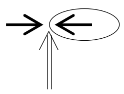
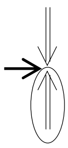
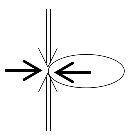
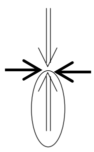
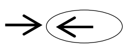
Fig. 13

From table 1 and figure 13 we see, that, despite of a different altitude of a potential barrier for miscellaneous isotopes and miscellaneous energy radiated α-particles varied on two orders, "Coulomb radius" of a potential barrier changes is weak within the limits of 30-50 fm. About a radius of action of nuclear forces, naturally, it is not necessary to speak, besides that the gravidynamic interplay wanes with spacing interval from a nucleus much more abrupt Coulomb. For a considered case of interplay the α-particle with a nucleus, as a radius of action of nuclear forces conditionally are possible are to considered spacing interval up to top of a potential barrier.

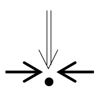
From the official theory of a tunnel effect it is known, that at $\hbar \to 0$ probabilities of passing through a barrier will be vanished. The physical sense it from the point of view of new physics is, that at $\hbar \to 0$ particle is gone rectilinearly and is "classic". The more $\hbar$ (moment of momentum) the more than radius of a screw trajectory of a particle and in the greater measure its "wave" properties are exhibited. Therefore particle appears behind a barrier, which one it should detain, if it moved rectilinearly. In the same way, if the axis of a screw trajectory is directed by a barrier and the classic particle will not be mirrored from a barrier, the particle driving on a screw trajectory can get in a barrier (so-called over barrier reflection).

Connection of a constitution with properties of light nuclei

Allowing bond energy in nuclei (MeV): ${}_1D^1$=2.20; ${}_1T^3$=8.49; ${}_2He^3$=7.72; ${}_2He^4$=28.3 and energy of repulsing of protons in a nucleus (on one proton) 0.77 MeV, is possible to figured the connecting schemas of nucleons in a nucleus with the applicable winning of energy at this connection. The attached particle is shown in an ellipse. The neutrons are figured by a double arrow, and protons - unary. The direction of arrow demonstrates a direction of rotation of a proton.

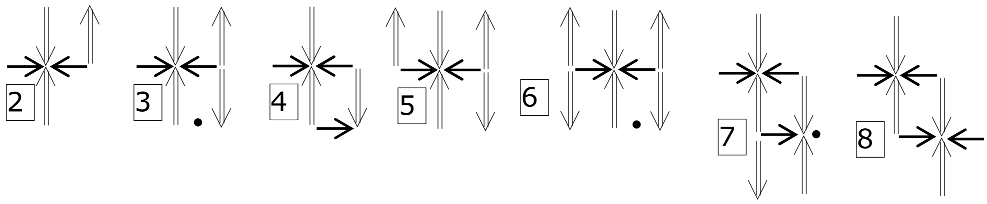
Joining	Winning of energy, MeV	The notice
	2.2	Formation of a deuteron 2.2 MeV
	5.52	Formation ${}_2He^3$ 7.72 MeV
	6.29	Formation of tritium 8.49 MeV
	19.8	Formation ${}_2He^4$ 28.3 MeV
	20.58	Formation ${}_2He^4$ 28.3 MeV
	-0.77	Repulsing of the proximate protons

Now it is possible to consider connection of a constitution of nuclei and their properties, moving in the side of a nucleus ${}_6C^{12}$, more composite nuclei there is no sense to consider, the principles are identical to all nuclei. Two protons or two neutrons can not formed a steady nucleus. A reason that for guarantee of gravidynamic attraction "of frameworks with a current", components of protons should move in parallel each other, but then they are repulsed at the expense of gravidynamic analog of force of the Lorentz and on the contrary. In a deuteron the repulsing at the expense of gravidynamic analog of force of the Lorentz indemnifies an electron of a neutron, which one takes a position between protons and thus links them, therefore connection of nucleons in a deuteron small. Though the formation of tritium slightly is more expedient, than formation ${}_2He^3$, but the gravidynamic connection is identical for these particles. As the exuberant neutrons are inclined to be transformed into protons, the nucleus of tritium is not steady: ${}_1T^3 \rightarrow {}_2He^3 + e^- + \tilde{\nu}$ (further neutrino in reactions to indicate we shall not be). The closing of a gravidynamic field inside a torus from four nucleons α-particle is so expedient, that even if in a nucleus ${}_2He^3$ by force to place one more proton in a place by the labeled dark point, it will prefer to be turn into a neutron, than to be eliminated (1): ${}_2He^3 + {}_1H^1 \rightarrow {}_2He^4 + e^+$. In α-particle the gravidynamic field out practically does not leave. If the additional nucleons can not split

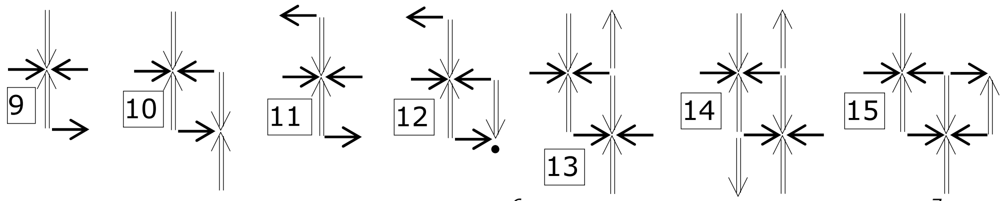


1

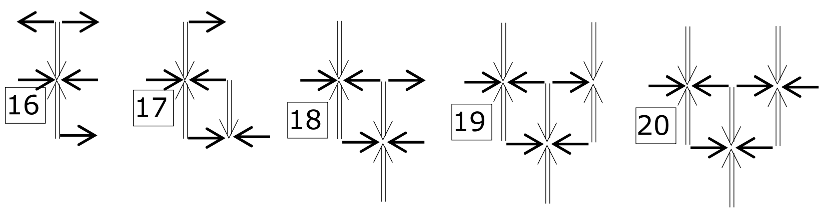
a gravidynamic flow to remove a part it from α-particle out, such nuclei will appear not stable.



The nucleus ${}_2He^5$ (2) is unstable: ${}_2He^5 \rightarrow {}_2He^4 + n$. The nucleus ${}_2He^6$ (3) too is not steady, but there is a capability to split a gravidynamic flow by transformation of one neutron in a proton and building it in a place labeled with a point. In outcome the nucleus ${}_3Li^6$ (4) will be formed: ${}_2He^6 \rightarrow {}_3Li^6 + e^-$. The nucleus ${}_2He^7$ (5) has such large excess of neutrons, that releases one of them: ${}_2He^7 \rightarrow {}_2He^6 + n$. Further behavior ${}_2He^6$ we have discussed above. The nucleus ${}_2He^8$ (6) even less steadily also can release a neutron, having turn into ${}_2He^7$ or one neutron is transformed into a proton, which one is built into a place labeled with a point: ${}_2He^8 \rightarrow {}_3Li^8 + e^-$. The nucleus ${}_3Li^8$ (7) also is unstable since here is very expedient to complete second a α-particle, by transforming a neutron in a proton and to place it in a place labeled with a point. In outcome ${}_4Be^8$ (8) will be formed, which one is extremely unstable, since gravidynamic flows again are closed inside α-particles and do not link them among themselves: ${}_4Be^8 \rightarrow 2{}_2He^4$. This property of a nucleus Be^8 is expedient to use in exothermal nuclear reactions. A nucleus ${}_3Li^5$ (9), as it is visible from a figure can not be steady and is disintegrated on a proton and α-particle: ${}_3Li^5 \rightarrow {}_2He^4 + {}_1H^1$. The nuclei ${}_3Li^6$ (4) and ${}_3Li^7$ (10) are steady, since splitting of a gravidynamic flow is ensured.



From figures 4 and 10 it is visible aiming ${}_3Li^6$ to accept a deuteron, and ${}_3Li^7$ to accept or neutron transformed into proton, or proton. In outcome both nuclei will forms unstable ${}_4Be^8$. In a nucleus ${}_4Be^6$ (11) to hold two protons for α-particle there is no capability, therefore it is disintegrated: ${}_4Be^6 \rightarrow {}_2He^4 + 2{}_1H^1$. To a nucleus ${}_4Be^7$ is expedient in a position marked by a point, to gain a neutron, therefore it is easiest to make it by transformation is weak of a bound proton in a neutron as a result of capture proximate to a nucleus of an electron: ${}_4Be^7 \rightarrow {}_3Li^7 + e^+$. ${}_4Be^9$ (13) is an alone steady isotope of beryllium, in its two α-particles is extra connected by a neutron. The nucleus ${}_4Be^{10}$ (14) would be steady, if the capability has not appeared to transform one of neutrons into a proton, again to split a gravidynamic flow α-particle, and to form thus steadier nucleus ${}_5B^{10}$ (15) as a result of long-lived process: ${}_4Be^{10} \rightarrow {}_5B^{10} + e^-$.



The nucleus ${}_5B^7$ (16) can not be steady, since to alone α-particle "sticked" three protons are very weakly with it bound, therefore nucleus is disintegrated: ${}_5B^7 \rightarrow {}_2He^4 + 3{}_1H^1$. The nucleus ${}_5B^8$ (17) provides cleavage of a gravidynamic flow α-particle and, thus creates conditions for formation second α-particles. The weakly bound proton is transformed into a neutron as a result of e-capture and is built into a place marked by a point with the formation ${}_4Be^8$. The nucleus ${}_5B^9$ (18) represents is weakly a bound system two α-particles and proton, which one dilapidates on components. ${}_5B^{11}$ (19) is the most widespread steady isotope of a boron, since in its the repeated cleavage of a gravidynamic flow α-particle is ensured, that creates conditions for construction by third α-particle in a nucleus. Apparently, that the nucleus $_5B^{11}$ with large desire accepts a proton or even a neutron, which one will turn to a proton to complete by a third a α-particle with formation $_6C^{12}$ (20). Though the isotope of carbon $_6C^{12}$ has a very strong and steady nucleus, but in reacting $_5B^{11}+n\to{}_6C^{12}+e^-$ a lot of energy is exuded, which one has enough, that so to excite a nucleus $_6C^{12}$, that it dilapidates on separate α-particle. For practical usage the "clean" and cheap reacting is perspective (it is possible to use natural materials not partitioning isotopes): $_5B^{11}+{}_1H^1\to 3\,{}_2He^4$ Q≈8.6 MeV. From the analysis of properties of nuclei it is possible to draw a conclusion, that the most expedient process - completion up to full α-particle, thus if for this purpose is necessary a proton, and available there is a neutron, it is transformed into a proton. If the neutron is necessary, and available there is a proton, it is transformed into a neutron. On the second place on efficiency - completion up to a piece of a nucleus "tritium" (*pnn*) by connection of a neutron to "deuterium" (*pn*). Thus the piece of a nucleus (*ppn*) is transformed into a piece (*pnn*). Looking on the portraits of nuclei it is easy to imagine the mechanism of any nuclear reaction and approximately to estimate its heat effect. The magnetic moments of nuclei also can approximately be forecast under the portraits of nuclei. The precise values are connected to calculations leaving for subjects of this chapter. So, for example magnetic moment of deuterium is peer to the sum of magnetic moments of a proton and neutron (the small difference is connected to displacement of an electron of a neutron in the side of a proton). The magnetic moment He^3 is determined by the moment of a neutron, since the magnetic moments of protons are balanced. The magnetic moment He^4 is peer to zero point, since magnetic moments of nucleons completely compensated or, it is possible to consider that two magnetic moments of "deuterons" are mutually opposite. For Li^6 the magnetic moment is determined by "deuteron", for Li^7 - "triton", for Be^9 by a neutron etc. If in crystal lattice of a nucleus, quantity of neutrons rotated in one direction, is equal to quantity of neutrons rotated in an opposite direction, and that concerns protons, the magnetic moment of such nuclei is peer to zero point.

It is possible to make of the analysis of this chapter following conclusions. 1. The nucleons in nuclei densely are packaged, that is confirmed by experimental data. Therefore in a nucleus there is no capability to formed any shells, in which one the nucleons move. 2. The nuclei represent crystal lattice from alpha-particles. In these particles protons and the neutrons are duplicated and represent bosons from the point of view of official physics. Therefore Pauli Exclusion Principle to nuclei is not applicable. In this connection official physics is forced to negate existence of alpha-particles in a nucleus, contrary to apparent experimental data.

Thermonuclear synthesis

What temperature is reached at a collapse of space bodies.

At gravitational squeezing of a material the gravitational energy is peer:

$$E_g = \frac{GM^2}{R} \qquad (22),$$

where G - gravitational constant, M - mass of a space body, R - its radius.

Apparently, that all gravitational energy is transmuted into heat at an adiabatic compression:

$$Q = cM\Delta T \qquad (23),$$

where c - specific heat (for miscellaneous materials about 1 joule/g·deg), ΔT - difference final and initial temperature of a material.

Equating (22) and (23), we shall discover:

$$\Delta T = \frac{GM}{Rc} \qquad (24).$$

Substituting in (24) astronomical data, we shall discover: for the Sun ΔT= $19\cdot10^6$ ^{0}K, for Jupiter 177000 ^{0}K, for the Earth 6250 ^{0}K, for moon 282 ^{0}K.

As after formation of these space bodies for them was an opportunity during several billions of years to cool down at the expense of radiation, the received data more correct to refer to central area of the indicated bodies. Here it is necessary to allow that except for power loss at the expense of radiation, these bodies and gain it at the expense of a meteoritic and cometary bombardment. Neutralization of power loss of the Sun at the expense of thermonuclear synthesis here does not need to be viewed.

Let's find out requirements of formation of a neutron star at the expense of a collapse in the guess, that the energy at the expense of nuclear reactions is completely exhausted also cold star with mass of the Sun is squeezed from density approximately equal 1 g/cm^3 up to almost nuclear density 10^{13} g/cm^3. Under these conditions (24) will give increase of temperature on $3.67{\cdot}10^{12}$ ^{0}K. At this temperature any particle will have energy 474 MeV, that with a major reserve it is enough for "fusion" of any nuclei and formation of a neutron body with a very heat. Therefore supernucleus capable to be formed inside or outside of this body after a long-lived period of a cooling and further obturating, while the energy of particles will not decrease up to 7 MeV ($5.4{\cdot}10^{10}$ ^{0}K).

Direct formation of deuterium, tritium and $_2He^3$.

In chapter 12.2 [1] was shown, that the maximum height of a potential barrier at interaction of alpha-particles with different nuclei is arranged apart, approximately, 30 fm ($30{\cdot}10^{-13}$ cm) between interacting particles and practically does not depend on mass of nuclei. The potential energy of two protons apart r makes e^2/r, and their energy, bound with heat motion at counter collision will make $10kT$. In the chapter about protons is shown, that the total energy of a particle moves on a screw trajectory, will make $5kT$ (has 10 degrees of freedom).

Then:

$$T = \frac{e^2}{10k \cdot r} \qquad (25).$$

Substituting in (25) the above-stated value r and world constants, we shall discover T=$55.6{\cdot}10^6$ ^{0}K. Thus, at this temperature the deuterium will be formed without problems at merging two protons: $_1H^1+_1H^1=_1D^2+e^++\nu$. The formation of tritium and $_2He^3$ is even easier, since the neutron in deuterium promotes reactions: $_1D^2+_1H^1=_1T^3+e^++\nu$ and $_1D^2+_1H^1=_2He^3+\gamma$. Flowing past in further exothermic reactions in this intermixture not only to cover expenses energy, but also considerably exceed them: $_1H^1+_1T^3=_2He^4$+Q, $_1D^2+_1D^2=_2He^3+_0n^1$+Q, $_1D^2+_1T^3=_2He^4+_0n^1$+Q, $_2He^3+_0n^1=_2He^4$+Q. The neutrons in a composition of nuclei not only remove a potential barrier further 30 fm, but also considerably reduce its value at the expense of additional of a gravidynamic attraction between impacting particles. It is visible not only for two isotopes Sm^{146} and Sm^{147} in table 12.2.1 of chapter 12.2, but also from experimental data of a nuclear physics. For example, the reaction $_1D^2+_1T^3$ goes already at temperature in 6 times below (approximately, 10^6 ^{0}K) and can be excited by jet explosion of customary explosive ("pure" hydrogen bomb).

Comparing temperatures of entrails of space bodies with temperatures of direct thermonuclear synthesis (without consideration reactions with neutrons and catalytic cycles) it is possible to make following deductions. For space bodies with mass of the Sun the thermonuclear synthesis easily is feasible, since temperature, demanded for it, all in 3 times more temperature achieved at the expense of a collapse. In maxwell allocation of particles on energies there are enough of such prompt particles. Therefore prompt heating of entrails at the expense of thermonuclear synthesis gives in thermal explosion of a star and drop of a shell in space. For space bodies with mass of Jupiter temperature inside in 300 times is less indispensable, therefore only some the extra prompt particles are capable to direct nuclear fusion. For such space bodies the speed burst with formation of a star is impossible at reaching certain radius at a collapse, since such radius is inaccessible at the expense of counteraction of pressure gas. There is only developmental way of gradual heating of entrails at the expense of languidly flowing past fusion reactions with accumulation of deuterium. As soon as deuterium will be accumulated enough (tritium is radioactive, therefore is not accumulated in sufficient amount), it is capable to begin reaction with formation of neutrons, which sharply one will speed up process of heating of entrails up to flash point of a new star. Detection in radiation of Jupiter the neutrino will confirm that the relevant reactions already going. The circumscribed sluggish evolution in a star - destiny of all planets of Jupiter's group intensively incrementing mass at the expense of capture. To terrestrial planets similar destiny does not threaten because of low temperature of entrails and absence of free protons. The infrequent acts of capture a space neutrino with very major energy and the fading processes of a radioactive decay in entrails can not compensate gradual cooling of these planets.

Nuclear reactions with neutrons.

For nuclear reactions with neutrons there is no necessity for heats, since the neutron is capable freely to be joined to protons or to dive into a nucleus. What natural environments for "cold" formation of neutrons exist? The proton can be transmuted into a neutron only inside a nucleus of atom possessing surplus of protons as contrasted to their equilibrium amount. For practical power generation this process does not approach. However, at a burnup of hydrogen in stars and their cooling nothing hinders with their repeated collapse. If mass of a former star is insignificant, it cools down absolutely and supplements the population "of a dark matter". If mass major, the collapse goes up to density, at which one happens neutronization of substance at the expense of losses by electrons of an angular momentum $\hbar$. Thus they are joined to protons with formation of neutrons. At accumulation sufficient amount of neutrons there is a new burst of a star at the expense of heat liberation in nuclear reactions to participation of neutrons. As a result of these reactions, eventually, the iron and nickel will be formed. The nuclear reactions again cease, the star again cools down. If it's mass is insufficient for global neutronization of substance, the cooled down "iron" star will supplement "a dark matter". If mass remains huge, the new collapse is fatal with formation of a neutron star. The neutron star is in principle labile, at reaching nuclear density and sufficient cooling inside it the supernucleus will be formed, that gives this time to so grandiose to explosion, that all substance is diffused in space, there is "Big Bang" in small scale and formation except for light, heavy and super heavy elements (debris of a supernucleus).

In space the long-lived existence of "cold" electrons is quite possible, which one have lost a moment, by transmitting its photons of relict radiation or other particles. Thus the electrons become "superconducting" since ambient temperature corresponds $2{,}7^0\ K$ and are capable with positive protons to form "minihydrogen" – neutrons.

The mechanism of direct nuclear fusion on an example of formation of deuterium.

When the proton will appear on vertex of a potential barrier of interaction, it starts "to drops" in a potential well of a gravidynamic attraction to other proton. The process is similar to "drop" of an electron to a proton at formation of atom of hydrogen. Thus the exuberant energy, is necessary to diffuse which one to complete process, is lost not at the expense of radiation of photons, and at the expense of formation of a pair an electron - positron and pairs a neutrino - antineutrino. The last pair is result of decay of a photon in powerful electrical and a gravidynamic field of two protons. An electron, not having an angular momentum $\hbar$, and antineutrino are joined to a proton, forming "minihydrogen" - neutron, long before reaching bottom of a potential well (differently it cannot be reached) in which one there is already neutron. As a whole, we shall watch following reaction: ${}_1H^1+{}_1H^1={}_1D^2+e^{+}+\nu$.

Thermonuclear synthesis on a kitchen

In childhood mine favorite, but dangerous toy was "podjig". It represents the L-type bent metal tube, inside of which one chop up of the match heads, the L-type bent nail bevel way to an axis of a tube is inserted into a tube, which one is spanned by elastic with a bend of a tube. If to press elastic, under its activity the nail hits on a combustible material in a tube and there is a detonation to deafening explosion. On a figure 14 the device for thermonuclear synthesis grounded on exact the same principle is shown.

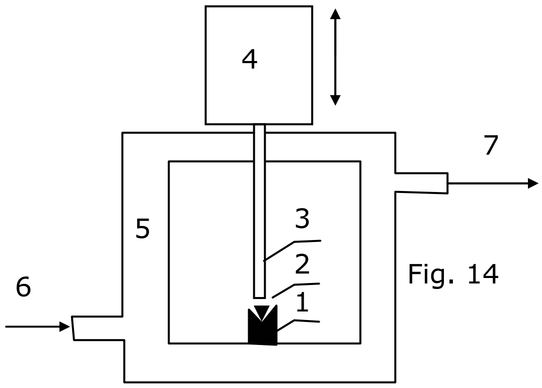


Fig. 14

In numerals on a figure 12.4.1.1 are indicated: 1 - matrix, 2 - punch, 3 - rod, 4 - anvil block, 5 - boiler, 6 - water in the boiler, 7 - steam in the turbine.

On bottom of a tapered matrix is located small crystal Li^6D (hydride of a light isotope of lithium in linking with deuterium) with mass 0.1 mg. A tip 2 rods 3 has the little bit smaller cone opening, than matrix and is capable to be abutted with it only by vertex of a cone. On a rod hits an anvil block of 4 mass 10 kgs with velocity of 40 m/sec. A matrix, punch and rod are arranged inside the boiler 5, in which one the water through a nipple 6 goes and is carry off steam in the turbine through a nipple 7.

At the moment of shock anvil block on a rod, the kinetic energy of anvil block is transmuted into heat on vertex of a cone of a punch.

$$\Delta T = \frac{MV^2}{2cm} \quad (26),$$

where M - mass of anvil block, V - the velocity anvil block, c - heat capacity of hydride of lithium (~3.15 joule/g·deg), m - mass of hydride of lithium.

Substituting indicated values in (26), we shall receive $\Delta T=25\cdot10^6$ ^{0}K, that corresponds to temperature inside stars. At such temperature easily flows reaction: $Li^6+D\rightarrow2He^4+22$ MeV. As the isotope Li^6 is contained in amount only 7 % in natural mixture of lithium isotopes, and the deuterium hardly more than 0.01 %, deriving of these isotopes in the pure state is inconvenient. The circumscribed plant allows to realize thermonuclear synthesis with hydride of lithium Li^7H under the scheme: $Li^7+P\rightarrow2He^4+\gamma$. In this case it is possible to utilized natural materials without a laborious isotope separation, though the process ceases to be "pure". At the circumscribed minithermonuclear explosion 7.36 kw·hour of energy will be selected, which one has enough to heat 63 liters of water from 0 up to 100^0. The power explosion will appear not less than 30 million kilowatt. It is necessary each time to exchange a rod, matrix and a punch. I do not doubt that meticulous inventors automate this installation by principles of self-acting weapon. From the formula (26) it is visible, that by increase of mass of anvil block also its velocities it is possible to reach practically any desirable temperatures.

Thermonuclear synthesis in an industry

The circumscribed above expedient of thermonuclear synthesis can be made by continuous if to gun at the solid massive target, fix in a wall of the boiler by special bullets or shells arranged by the above-stated principle (of fig. 14). The wastes dumps downwards in the bin and are deleted. On a figure 15:

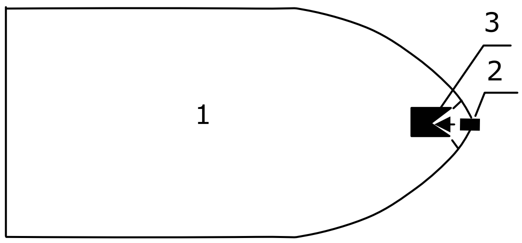


Fig. 15

1 - bullet, 2 - punch, 3 - matrix with crystal of hydride of lithium. In such expedient it is easy to reach much more high temperature, since at shock about a hindrance all kinetic energy of a bullet is affixed through a punch to a matrix, is hard by bound with a bullet. The similar device can be utilized for thermonuclear synthesis on reaction: $D^2+T^3 \rightarrow He^4$+n+17.6 MeV. For this purpose the punch represents the cylinder piston, and matrix - cylinder of capacity 0.01 mls, filled intermixture of deuterium and tritium. The reaction goes in favorable requirements very much high-pressure, if punch flat, and the matrix is accomplish with by a wrinkle wall. For example, the matrix can be accomplished as hollow of a leak-proof metal cone by diameter about the bottom of 3 mms, filled hydrogen. The cone by the basis is bear on a plane, and the flat punch hits on vertex of a cone. During shock a cone wrinkles, maintaining impermeability, temperature inside reaches tens millions degrees, and pressure about one million atmospheres. Therefore shock thermonuclear synthesis is represented to most perspective for power generation.

In this connection it is interesting to investigate anomalies of an isotope structure of matter in large craters at dip of meteorites.

The perfect construction is shown on a figure 16.

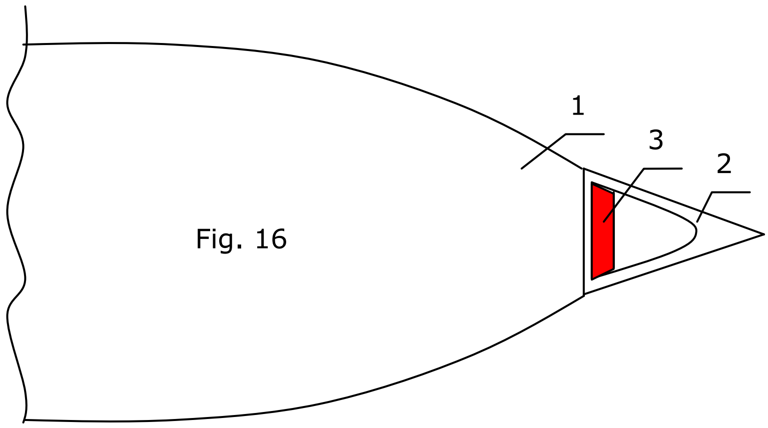


Fig. 16

1 - body of a bullet, 2 - creasing property a pressurized tip by a filled mix of deuterium and hyzone, 3 - detonator from mercury fulminate.

At hit in the solid target to impact excitation of a thermonuclear reaction the operating from detonating a detonator and hollow-charge gas jet in a direction of the outside end of a tip is added. It guarantees successful completion of process.

It is possible to offer one more original way of industrial obtaining of a nuclear power of synthesizing. If two orbital electrons of two atoms of an atomic hydrogen will confront, they will lose the moments of momentums and «will fall» on positive protons, in outcome two neutrons will appear. This process will be accompanied by a gamma-radiation. The further heat generating reactions with participation of neutrons in environment of Hydrogenium flow past no problem. The heat is not necessary for similar generation of neutrons by impact of orbital electrons, but the high pressure is necessary, that the impact of orbital electrons at random motion of atoms has become though a little noticeable. Apparently, the similar process of a nuclear fusion of neutrons and further of deuterium and hyzone takes place inside Jupiter, but it is limited by speed of generation of neutrons as the probability of effective impact of orbital electrons at their random positional relationship is smallest.

Apparently, that for industrial generation of neutrons from an atomic hydrogen it is necessary sharply to increase probability of impact of orbital electrons. Here it is necessary to update, that impact of electrons is understood not as their direct contact but only electrostatic interplay resulting in to loss of an orbital moment. Apparently, that throw together thus mobile electrons practically it is impossible, since they will take divergent trajectories long before «impact». Bound only is hard with a massive positive proton an electron is dispossessed capabilities of free moving. Practically to take advantage of this circumstance, the interplay of two colliding beams of an atomic hydrogen is necessary. One bundle «right» (the orbital electrons are gyrated around of a positive proton clockwise in a current of traffic of atom), and other «left-hand» (electron motion counter-clockwise). This situation is shown on a figure 17 for two adjacent atoms with an opposite direction of motion.

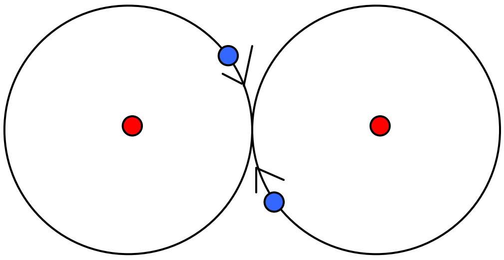


Fig. 17

On a figure 18 the design of the perfect compact reactor of a nuclear fusion of any desirable power is shown.

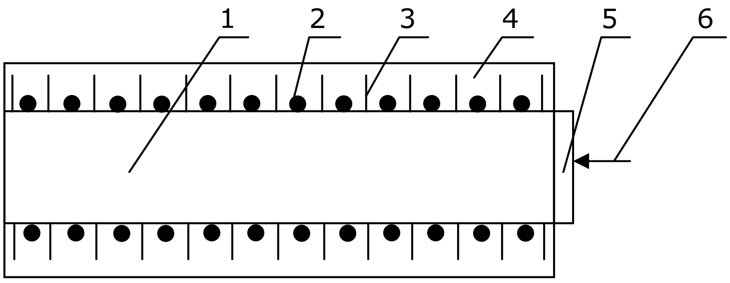


Fig. 18

On a figure: 1 - heat-resistant pressurized barrel, filled Hydrogenium, 2 - winding of the solenoid for creation inside the barrel of a magnetic field, 3 - rib of heat removal, 4 - heat carrier, 5 - window, transparent for radiation for start of the reactor, 6 - starting radiation.

The sizes of the reactor can be anyone from the size of a pencil up to anyone, spotted by requirements on power.

The reactor as follows works. The barrel 1 is spacefilled by Hydrogenium and hermetically is closed down by a window 5. Molecular dissociation of Hydrogenium up to an atomic hydrogen either heating by that or different way of Hydrogenium in the barrel or radiation through a window 5, capable further is made to decompose molecules of Hydrogenium on separate atoms. The atoms of Hydrogenium will be oriented in a magnetic field so, that the orbital magnetic moments of electrons will be directed to one side, as shown in a figure 17. Thus are created conditions for impact of electrons and formation of neutrons, which one in the subsequent reactings create deuterium, hyzone, helium and all remaining chemical elements. It is understandable, that the probability of impact of electrons is small also speed of a nuclear fusion bodily is determined by speed of generation of neutrons, since the reactions with their participation go no problem. On a figure 18 the batch reactor such as a tank with gasoline is shown, it is necessary to fill up which one. In the reactor of continuous operating after excitation of generation of neutrons through the barrel slowly pump through Hydrogenium.

The ideal conditions for a nuclear fusion by impact of electrons are available for space objects hydrogen-containing and a powerful magnetic field (Jupiter, stars). Therefore it is understandable whence for the Sun the high-gravity elements, for example, lead have appeared. In connection with set up, there are large doubts in division of stars into two generations. Besides inside stars there are such nuclear processes, the official science does not guess which one yet. The described mechanism of generation of neutrons should be realized in vast clouds of an atomic hydrogen and to give the answer to a problem: whence in space there are free neutrons?

One more propose way of obtaining of a nuclear power it is possible to name controlled proton transmutation of nuclei (see chapter 29.7.3 [1]) or external photoelectric effect of nuclei. In chapter 6.1 [1] was shown, that the electron-binding energy with a positive proton in neutrons of nuclei of atoms is about identical to any nuclei and makes 0.76476 MeV. Therefore, the photons with this energy are capable to beat out electrons from neutrons of a nucleus. It is possible to name this effect as an external photoelectric effect of nuclei by analogy with a known external photoelectric effect. As a result of irradiation of any matter by photons with such energy the neutrons of nuclei are disintegrated on an electron and positive proton. The products of decay of a neutron can not be retained on a surface of a nucleus and escape it. Thus, during irradiation nuclei of atoms are step-by-step transformed into Hydrogenium. Apparently, the indicated mechanism of formation of Hydrogenium acts near to space sources of rigid electromagnetic radiation. Apparently, that controlled proton transmutation is energetically expedient process, since expending 0.8 MeV on each neutron we receive a minimum 8 MeV of energy not counting that, which one will be received at decay with supersaturated positive protons of nuclei.

Energy levels of nuclei

As the structure of nuclei official physics does not know, their properties are described by a favourite method of orthodoxes - adjustment under the answer: «Picking up the order of levels of thin and rough structure it was possible to explain magic numbers, spin and magnetic moment of the majority of nuclei» (N.I. Kariakin etc. The brief reference book on physics. Moscow, 1962, page 426). In this chapter I shall be attempted to give only quality description of systems of energy levels of nuclei. It is conditioned by sufficient complexity of quantitative calculations, and any simplifications by nothing differ from frank adjustment under the necessary outcomes.

New physics distinguishes some systems of energy levels of nuclei, which one links:

1. With an isomerism of nuclei.
2. With different position of surface exuberant neutrons.
3. With different of energy levels of a neutron.

Let's consider each system explicitly.

Nuclear isomers.

Any nucleus has large capabilities for formation of numerous isomers. For example, the nucleus of uranium (579997) (see chapter 12) is possible in versions: (379999), (779995), (15799951), (399997), etc. Such isomers can have differences in energy levels about mean bond energy of a nucleone in a nucleus (several MeV).

Position of exuberant neutrons.

The exuberant neutrons can not be inside crystal lattice of α-particles, therefore place only on a surface of a nucleus. For miscellaneous isotopes of one element miscellaneous quantity of exuberant neutrons, therefore energy levels them also can differ on some MeV. For the given isotope it is possible to enter concept «of neutron isomers». Quantity of exuberant neutrons never reaches theoretically limiting value (chapter 12) because of sharp increase of intensity of a beta-decay, therefore there are many vacant places, both on boundary of α-planes, and on outside planes. Therefore depending on disposition of neutrons the set of neutron isomers of a nucleus with energy levels of the order 1 MeV is possible. Besides the nuclei are rotates also rotation axis on power reasons should be perpendicular to α-planes. Then there is a capability for numerous additional neutron isomers depending on, whether the given neutron closer to «pole» or to «equator» places. Here difference in levels of energy will be even less.

Energy levels of a neutron.

In a ground state the electron which is forms with a positive proton a neutron, has bond energy 1.293 MeV, that corresponds to a difference of weights of a neutron and positive proton. In this condition the electron very much resembles a ground state in atom of

Hydrogenium. Numerous levels of energy of a separate neutron down to its «ionization» - radiation of an electron and transformation in a positive proton therefore are possible. The greatest possible energy is peer this system of numerous levels 1.293 MeV.

Thus, each nucleus has so many possible power condition, that it is easy to customize with them any false theory.

References:

http://www.new-physics.narod.ru