

EXPLANATORY NOTES TO TABLES

THE SEQUENCE OF THE CONVERSIONS OF THE PREVIOUS CHEMICAL ELEMENT TO THE SUBSEQUENT CHEMICAL ELEMENT

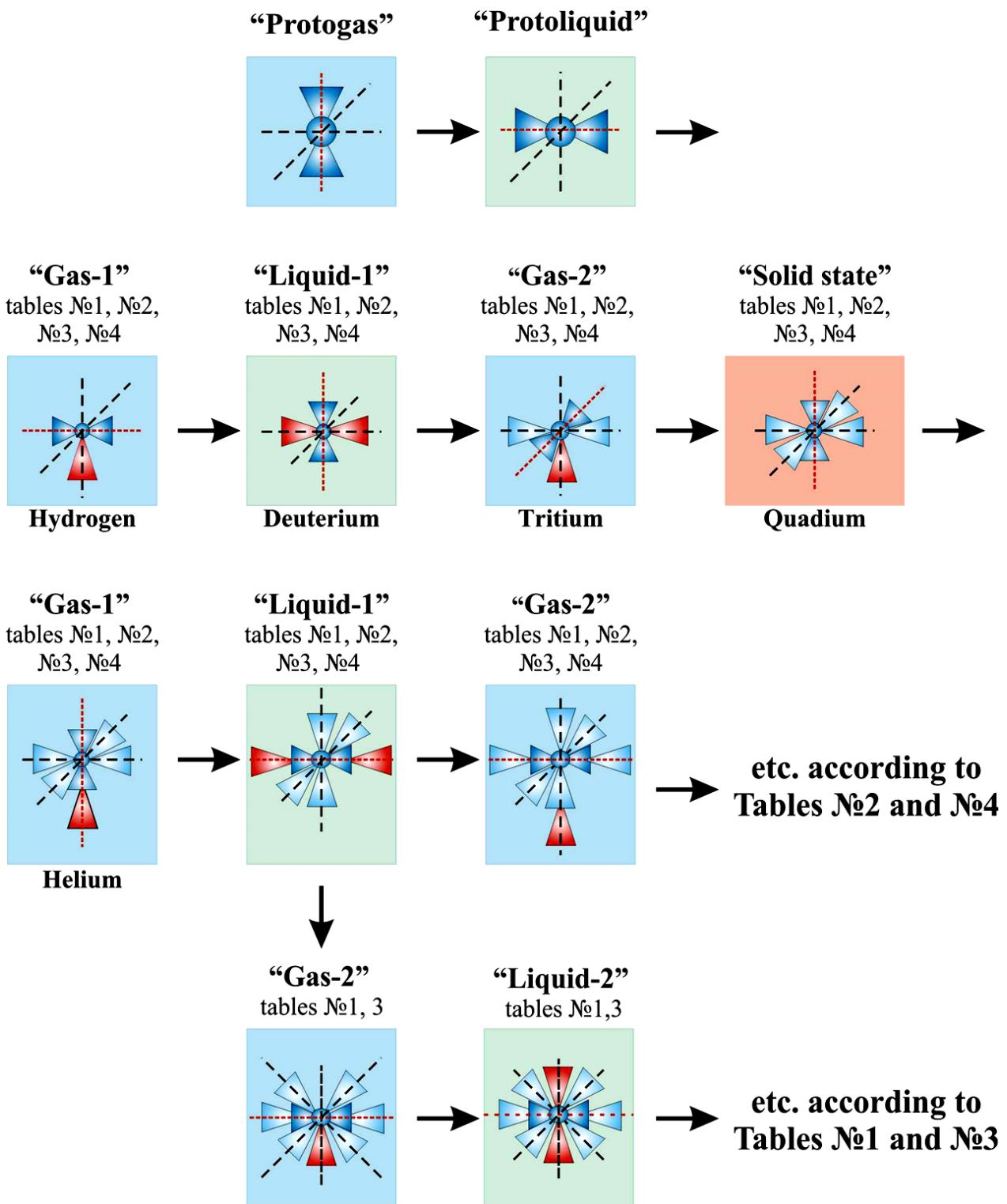


Fig.1

**SEQUENCE OF CONVERSIONS ON THE EXAMPLE
OF THE CHEMICAL ELEMENT HELIUM**

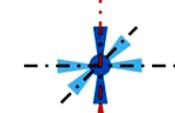
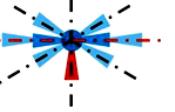
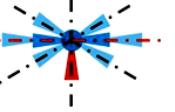
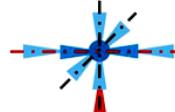
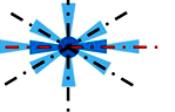
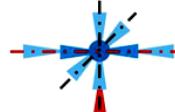
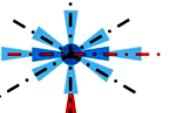
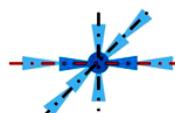
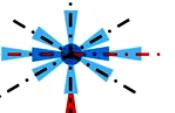
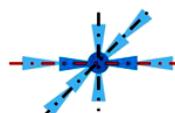
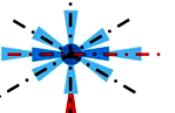
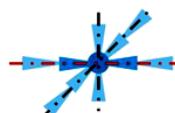
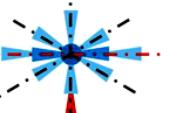
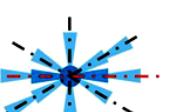
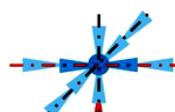
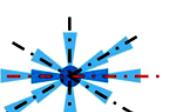
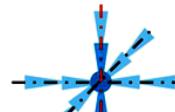
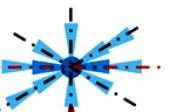
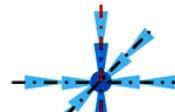
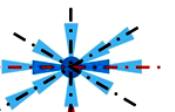
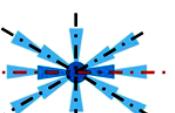
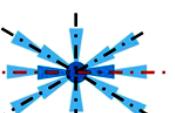
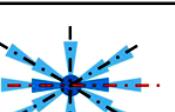
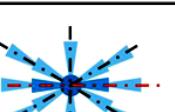
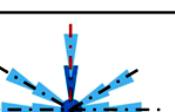
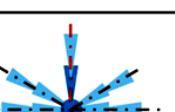
Table №2 (6x4) Table №4 (6x5)		Table №1 (8x4) Table №3 (8x5)	
He^2_{g1}		He^1_{g2}	
He^4_{g1}		He^3_{g2}	
He^2_{l1}		He^1_{l2}	
He^4_{l1}		He^3_{l2}	
He^2_{g2}		He^1_{g3}	
He^4_{g2}		He^3_{g3}	
He^2_{l2}		He^1_{l3}	
He^4_{l2}		He^3_{l3}	
He^2_{g3}		He^1_{l3}	
He^4_{g3}		He^3_{l3}	
He^2_{ss}		He^1_{g4}	
He^4_{ss}		He^3_{g4}	
		He^1_{ss4}	
		He^3_{ss4}	
		He^1_{g5}	
		He^3_{g5}	
		He^1_{ss}	
		He^3_{ss}	

Fig.2

Verification of the theoretical views of neutron science on experimental data of modern physics in the area of the crystals (revision of the diameter of the neutron and the real sizes of the chemical elements).

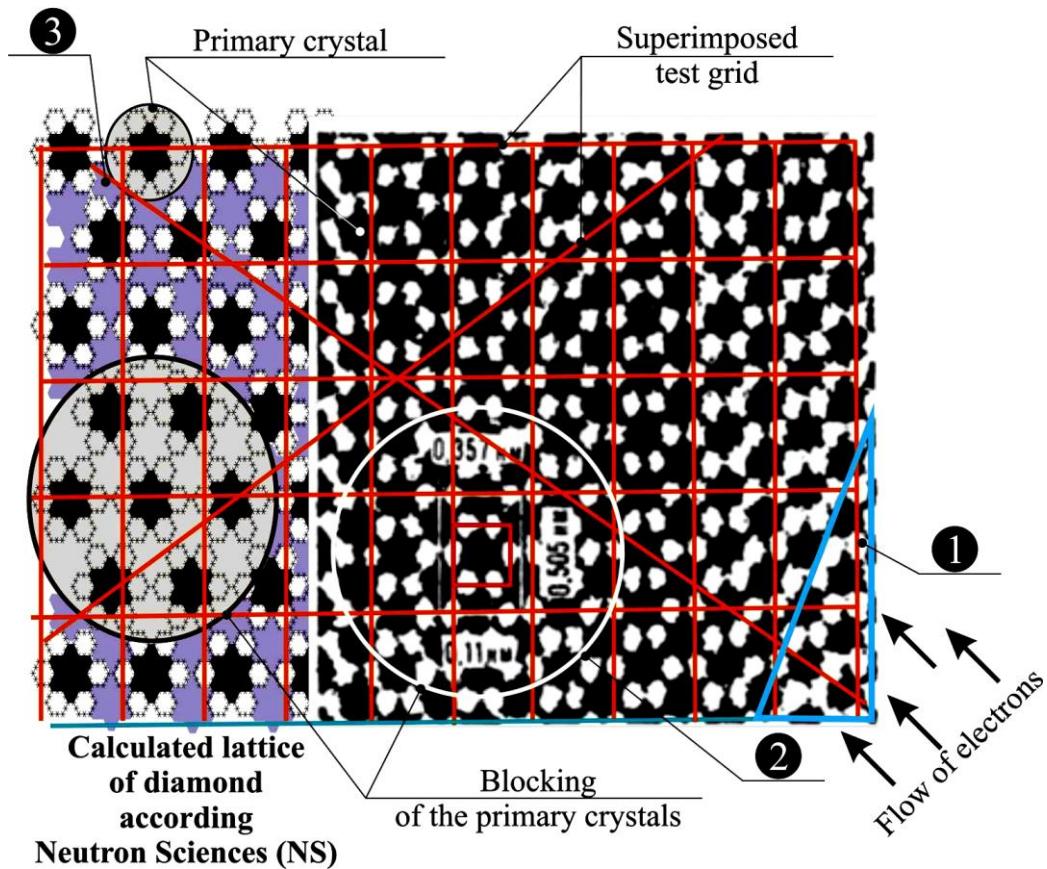
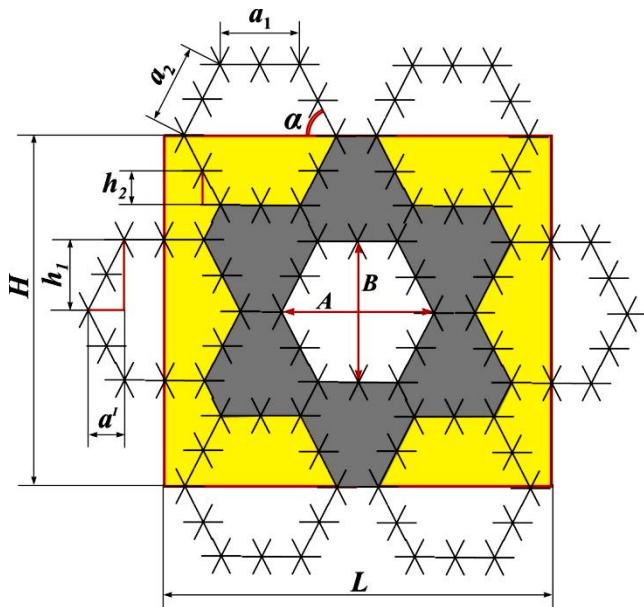
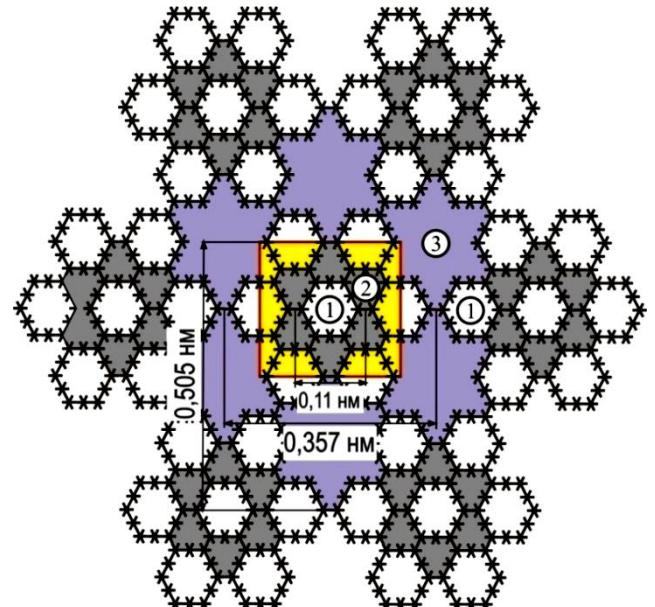


Fig.3. Electron micrograph of high-resolution of the diamond, the position of the carbon atoms projected on the plane (110).

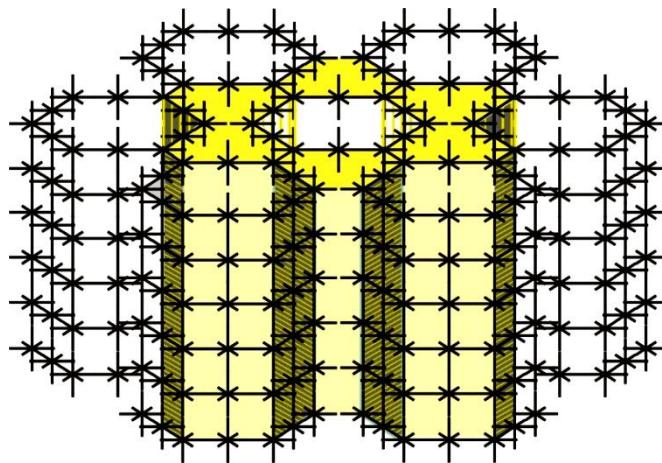


a) a primary crystal with sizes to calculate



b) blocking of primary crystals:

- 1 – hexagonal cavity formed by the 12 chemical elements containing gases;
- 2 – rod of light;
- 3 – domain

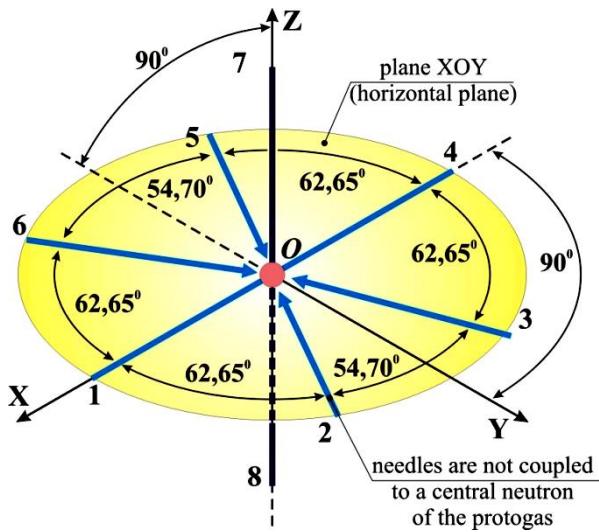


c) rod of light in the body of the primary crystal

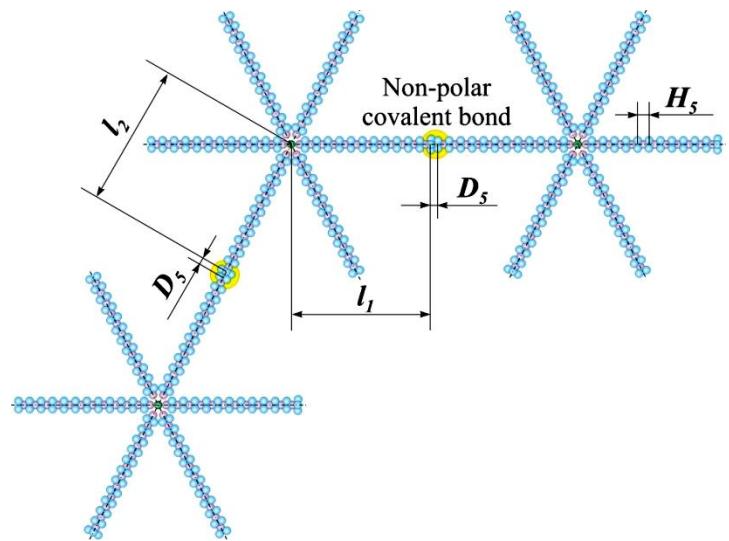
Fig.4.

C_{diamond} – "hedgehog" 8 × 5, 12 SU

Consider the fragment of the diamond crystal structure (*Fig.4, a*). Assume that it is built on "hedgehogs" C_{diamond} – 8×5 with the length of the needles N = 12 SU. "Hedgehogs" are linked non-polar covalent bond (see *Fig.5*). Let's do a calculation of the parameters of this structure.



a) «Hedgehog » 8×5, 12SU



b)

Fig.5

$$l_1 = ((N - 0,5)\sqrt{2} + 1)d \approx 17,263d; \quad l_2 = ((N - 0,5)\sqrt{2} + 1,348)d \approx 17,611d;$$

$$a_1 = 4l_1 + 2D_5 = 70,736d; \quad a_2 = 4l_2 + 2D_5 = 72,128d,$$

where d – diameter of the neutron, $H_5 = \sqrt{2}d$, $D_5 = d/\sqrt[4]{2}$.

$$a' = a_2 \cdot \cos 62,65^\circ = 33,137d;$$

$$h_1 = a_2 \cdot \sin 62,65^\circ = 64,065d; \quad h_2 = \frac{a_2}{2} \cdot \sin 62,65^\circ = \frac{h_1}{2} = 32,032d;$$

$$A = a_1 + 2a' = 137,010d; \quad B = 2h_1 = 128,130d;$$

$$L = 2A + a_1 = 344,756d; \quad H = 2B + h_1 = 320,325d;$$

$$L/H = 1,076 \approx 1.$$

The crystal structure, which is illustrated in *Fig. 5, a*, – static, i.e. it does not account for the deflection of the horizontal and vertical "skipping ropes" by the action of gravitons.

In the dynamics the ratio

$$L/H = 1$$

since the curving of the horizontal "skipping ropes" leads to a decrease in L, and stretching a vertical "skipping ropes" leads to an increase in H.

Let's define what values 1 and 2 lead to the ratio:

$$\begin{aligned} L/H &= 1 \\ L &= H \\ 2A' + a'_1 &= 2B' + h'_1; \\ 2(a'_1 + 2a'') + a'_1 &= 2 \cdot 2h'_1 + h'_1; \\ 3a'_1 + 4a'' &= 5h'_1; \\ \underbrace{3a'_1 + 4a'_2 \cos \alpha}_{L} &= \underbrace{5a'_2 \sin \alpha}_{H}; \\ a_1 &= \frac{a'_2(5 \sin \alpha - 4 \cos \alpha)}{3}. \end{aligned}$$

Assume in first approximation that the horizontal and vertical 'skipping ropes' deformed in such a way that $\alpha = 62,65^\circ = \text{const}$. Then

$$a'_1 = \frac{a'_2(5 \sin 62,65^\circ - 4 \cos 62,65^\circ)}{3};$$

$$a'_1 = 0,8678 \cdot a'_2, \quad a'_2 = 1,1523a'_1.$$

Let's consider limiting cases:

1) only vertical 'skipping ropes' are stretched:

$$a'_1 = a_1 = 70,736d, \text{ then } a'_2 = 1,1523 \cdot 70,736d = 81,5091d;$$

2) only horizontal 'skipping ropes' are flexed

$$a'_2 = a_2 = 72,128d, \text{ then } a'_1 = 0,8678 \cdot 72,128d = 62,5927d.$$

At the same time horizontal "skipping ropes" will flexed, vertical "skipping ropes" will stretch, and the values a_1 and a_2 will take the average value:

$$a_{1\text{average}} = (a_1 + a'_1)/2 = 66,6643d; \quad a_{2\text{average}} = (a_2 + a'_2)/2 = 76,8186d.$$

With these values $a'_{1\text{average}}$ and $a'_{2\text{average}}$

$$L = 3a_{1\text{average}} + 4a_{2\text{average}} \cos 62,65^\circ = 341,16d;$$

$$H = 5a_{2\text{average}} \sin 62,65^\circ = 341,16d.$$

Thus, $L = H = 341,16 d$.

We have the ability to accurately determine the diameter of a neutron on the largest size of 0,505nm at the pictures in zone 2. If we compare *Fig. 3.* and *Fig.4, a-b*, we see that the $2H = 0,505$ nm.

Thus, the diameter d of the neutron is equal to:

$$0,505(\text{nm}) = 2 \cdot 341,16d \Rightarrow d = \frac{0,505(\text{nm})}{2 \cdot 341,16} \approx 0,00074(\text{nm}) = 0,74(\text{pm}) = 0,74 \cdot 10^{-12}(\text{m}).$$

$$d = 0,74 \cdot 10^{-12}(\text{m})$$

Accordingly, we get:

$$H_4 = \frac{2\sqrt{6}}{3} d \approx 1,210 \cdot 10^{-12} \text{ (m)} = 1,210 \text{ (pm)}; \quad H_5 = \sqrt{2}d \approx 1,047 \cdot 10^{-12} \text{ (m)} = 1,047 \text{ (pm)}.$$

Let's compare the obtained value of the diameter of a neutron $d = 0,74 \text{ pm}$ with a tabular value of the diameter of a proton, i.e. the nucleus of an atom of hydrogen (according to Modern Sciences (MS)).

The radius of the proton in MS is equal to $6.5 \cdot 10^{-7} \text{ nm} = 6.5 \cdot 10^{-16} \text{ m}$ (see the website "*Chemist's Handbook of the 21st century*", <http://chem21.info/page/249122225148062107120160016075011146186130110135/> (in russian) or *Chemistry: Reference. The Book for students. Authors: Yu.D. Tretyakov, N.N.Oleynikov, Y.A.Kessler, I. V. Kazimirchik. Under the editorship of Yu.D.Tretyakov. 2nd edition, revised. (Moscow: Publishing House "Education", 1989)* (in russian))

$$\frac{d_{\text{neutron(NS)}}}{d_{\text{proton(MS)}}} = \frac{d_{\text{neutron(NS)}}}{2 \cdot r_{\text{proton(MS)}}} = \frac{0,74 \cdot 10^{-12}}{2 \cdot 6,5 \cdot 10^{-16}} \approx 569.$$

Finally, it happened! The diameter of a neutron is equal to $d = 0,74 \cdot 10^{-12} \text{ m}$, and from that moment we can know the actual size of all the chemical elements, and how many of them are in any volume.

Knowing the actual diameter of a neutron, we can determine the actual geometric dimensions of the "hedgehogs" of the chemical elements and their gravitational masses.

We take a simple substance of 1 kg, the crystal lattice of which is made up of the "hedgehogs" of one kind, connected by a covalent bond.

Knowing gravitational density of the substance, we can find the volume of the substance $m = 1 \text{ kg}$:

$$V = \frac{m}{\rho_{gr}}.$$

If $V_{\text{hedgehogs}}$ – is the volume of one «hedgehog», then the number of «hedgehogs» $N_{\text{hedgehogs}}$ in the volume V is equal to

$$N_{\text{hedgehogs}} = \frac{V}{V_{\text{hedgehogs}}}.$$

The mass of one "hedgehog" will be equal to:

$$m_{\text{hedgehogs}} = \frac{m}{N_{\text{hedgehogs}}} = \frac{\rho_{gr} \cdot V}{V/V_{\text{hedgehogs}}} = \rho_{gr} \cdot V_{\text{hedgehogs}}.$$

$$\rho_{gr} = N_{\text{neutron}} \underbrace{\frac{\rho(\text{He})}{N_{\text{neutron}}(\text{He})}}_{=27} \Rightarrow m_{\text{hedgehogs}} = V_{\text{hedgehogs}} \cdot N_{\text{neutron}} \cdot \frac{206}{27}$$

Thus, to determine the mass of one the "hedgehog", you need to calculate the volume of one "hedgehog".

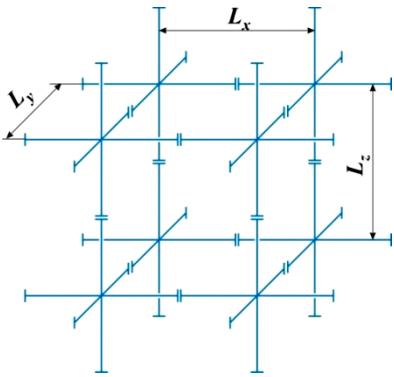


Fig.6. The covalent bond of the "hedgehogs" 6×5

1. The substance consists of "hedgehogs" 6 × 5-SS (solid state) connected by a covalent bond.

The covalent bond is performed by the coupling of the ends of the last structural units (SU) of the needles. Needles occupy such relative position that the contact of the neutrons in the SU will be maximum ("pentads" of the coupling SU are rotated relative to each other at 45°). Therefore, as the linear dimensions of the "hedgehogs", we take the distance between the centers of the "hedgehogs" L_x , L_y , L_z (**Fig. 6**).

$$L_x = L_y = ((2N-1)\sqrt{2} + 2 + 1/\sqrt[4]{2}) \cdot d;$$

$$L_z = ((2N-1)\sqrt{2} + 1/\sqrt[4]{2}) \cdot d;$$

where d – diameter of the neutron, $d = 0,74 \cdot 10^{-12}$ m, N – the number of layers of SU-5 in the needle of the "hedgehog".

$$V_{\text{hedgehogs}} = L_x \cdot L_y \cdot L_z = d^3 \cdot (16\sqrt{2}N^3 + 8N^2(2C_1 + C_2) + 2\sqrt{2}N(C_1^2 + 2C_1C_2) + C_1^2 \cdot C_2),$$

$$\text{where } C_1 = 2 + 1/\sqrt[4]{2} - \sqrt{2}; \quad C_2 = 1/\sqrt[4]{2} - \sqrt{2}.$$

N – the number of layers of SU-5 in the needle of the "hedgehog" 6×5 is defined by the formula:

$$N = \frac{N_{\text{neutrons}} + 1}{\frac{6}{\substack{\text{number of needles} \\ \text{in the hedgehog}}} \cdot \frac{5}{\substack{\text{the number of neutrons} \\ \text{in the SU-5}}}},$$

where N_{neutrons} – the true number of neutrons in the chemical element (**Summary table of conversions of chemical elements №6**)

$N_{\text{neutron}} + 1$ – the theoretical number of neutrons in the chemical element given the shortage of one neutron in protogas (see **Table of conversion No. 4**)

Then

$$V_{\text{hedgehog}} = d^3 \cdot \left(\frac{16\sqrt{2}}{27000} (N_{\text{neutrons}} + 1)^3 + \frac{8}{900} (N_{\text{neutrons}} + 1)^2 (2C_1 + C_2) + \frac{2\sqrt{2}}{30} (N_{\text{neutrons}} + 1)(C_1^2 + 2C_1C_2) + C_1^2 \cdot C_2 \right).$$

The mass of one "hedgehog" is defined by the formula

$$m_{\text{hedgehog}} = \frac{206}{27} \cdot N_{\text{neutrons}} \cdot d^3 \cdot \left(\frac{16\sqrt{2}}{27000} (N_{\text{neutrons}} + 1)^3 + \frac{8}{900} (N_{\text{neutrons}} + 1)^2 (2C_1 + C_2) + \frac{2\sqrt{2}}{30} (N_{\text{neutrons}} + 1)(C_1^2 + 2C_1C_2) + C_1^2 \cdot C_2 \right)$$

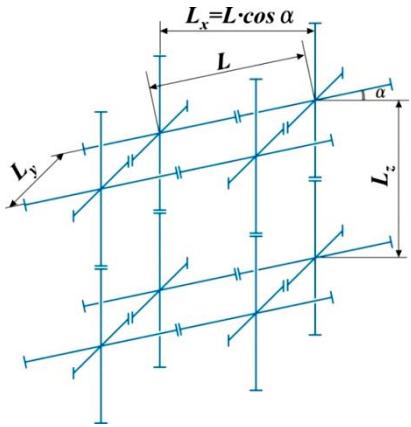


Fig.7. The covalent bond of the "hedgehogs" 6×4

2. The substance consists of "hedgehogs" 6 × 4-SS (solid state) connected by a covalent bond.

The covalent bond is performed by the coupling of the ends of the last structural units (SU) of the needles. Needles occupy such relative position that the contact of the neutrons in the SU will be maximum ("quads" of the coupling SU are rotated relative to each other at 60°). Therefore, as the linear dimensions of the "hedgehogs", we take the distance between the centers of the "hedgehogs" L_x , L_y , L_z (**Fig. 7**).

$$L = \left((2N-1) \frac{2\sqrt{6}}{3} + 2 + \frac{\sqrt{6}}{3} \right) \cdot d ;$$

$$L_x = L \cdot \cos \alpha = \left((2N-1) \frac{2\sqrt{6}}{3} + 2 + \frac{\sqrt{6}}{3} \right) \cdot d \cdot \cos \alpha ;$$

$$L_y = L = \left((2N-1) \frac{2\sqrt{6}}{3} + 2 + \frac{\sqrt{6}}{3} \right) \cdot d ; \quad L_z = \left((2N-1) \frac{2\sqrt{6}}{3} + \frac{\sqrt{6}}{3} \right) \cdot d ,$$

where d – diameter of the neutron, $d = 0.74 \cdot 10^{-12}$ m, N – the number of layers of SU-4 in the needle of the "hedgehog".

$$V_{hedgehog} = L_x \cdot L_y \cdot L_z = d^3 \cos \alpha \cdot \left(\frac{128\sqrt{6}}{9} N^3 + \frac{32}{3} N^2 (2C_1 + C_2) + \frac{4\sqrt{6}}{3} N (C_1^2 + 2C_1 C_2) + C_1^2 \cdot C_2 \right) ,$$

$$\text{where } C_1 = 2 + \frac{\sqrt{6}}{3} - \frac{2\sqrt{6}}{3} = 2 - \frac{\sqrt{6}}{3}; \quad C_2 = \frac{\sqrt{6}}{3} - \frac{2\sqrt{6}}{3} = -\frac{\sqrt{6}}{3} .$$

N – the number of layers of SU-4 in the needle of the "hedgehog" 6×4 is defined by the formula:

$$N = \frac{N_{neutrons} + 1}{\frac{6}{\substack{\text{number of needles} \\ \text{in the hedgehog}}} \cdot \frac{4}{\substack{\text{the number of neutrons} \\ \text{in the SU-4}}}}$$

where $N_{neutron}$ – the true number of neutrons in the chemical element (**Summary table of conversions of chemical elements №6**)

$N_{neutron} + 1$ – the theoretical number of neutrons in the chemical element given the shortage of one neutron in protogas (see **Table of conversion No. 2**)

Then

$$V_{hedgehog} = d^3 \cos \alpha \cdot \left(\frac{\sqrt{6}}{972} (N_{neutrons} + 1)^3 + \frac{1}{54} (N_{neutrons} + 1)^2 (2C_1 + C_2) + \frac{\sqrt{6}}{18} (N_{neutrons} + 1) (C_1^2 + 2C_1 C_2) + C_1^2 \cdot C_2 \right) .$$

The mass of one "hedgehog" is defined by the formula

$$m_{hedgehog} = \frac{206}{27} \cdot N_{neutrons} \cdot d^3 \cos \alpha \cdot \left(\frac{\sqrt{6}}{972} (N_{neutrons} + 1)^3 + \frac{1}{54} (N_{neutrons} + 1)^2 (2C_1 + C_2) + \frac{\sqrt{6}}{18} (N_{neutrons} + 1) (C_1^2 + 2C_1 C_2) + C_1^2 \cdot C_2 \right)$$

3. The substance consists of "hedgehogs" 8 × 4-SS (solid state) connected by a covalent bond.

The covalent bond is performed by the coupling of the ends of the last structural units (SU) of the needles. Needles occupy such relative position that the contact of the neutrons in the SU will be maximum ("quads" of the coupling SU are rotated relative to each other at 60°). Therefore, as dimensions that characterize the "hedgehogs", we take the distance between the centers of the "hedgehogs" L and L_z (**Fig. 8** – all six of the needles lying in a horizontal plane, have the same length).

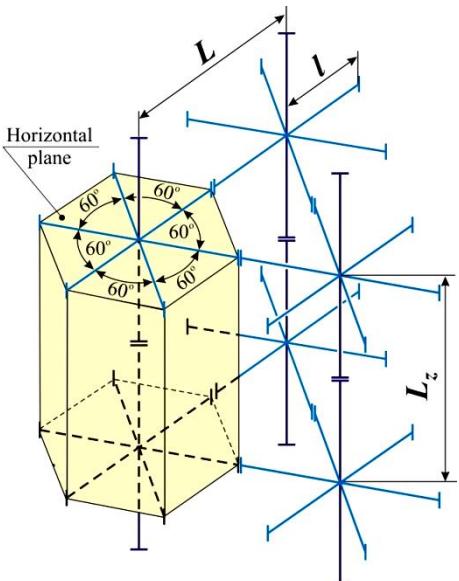


Fig.8. The covalent bond of the "hedgehogs" 8×4

$$l = \left((N - 0,5) \frac{2\sqrt{6}}{3} + 1 \right) \cdot d ;$$

$$L = 2l + D_4 = \left((2N - 1) \frac{2\sqrt{6}}{3} + 2 + \frac{\sqrt{6}}{3} \right) \cdot d ;$$

$$L_z = \left((2N - 1) \frac{2\sqrt{6}}{3} + \frac{\sqrt{6}}{3} \right) \cdot d ,$$

where d – diameter of the neutron, $d = 0,74 \cdot 10^{-12}$ m, N – the number of layers of SU-4 in the needle of the "hedgehog". $D_4 = \sqrt{6}d/3$ – the distance between the axis of the contacting "trio" of the needles which are in a covalent bond.

$$V_{hedgehog} = S_{hedgehog} \cdot L_z ;$$

$$S_{hedgehog} = 6 \cdot \frac{1}{2} \cdot \frac{L}{2} \cdot \frac{L}{2} \cdot \sin 60^\circ = \frac{3\sqrt{3}}{8} L^2 ;$$

$$V_{hedgehog} = \frac{3\sqrt{3}}{8} d^3 \cdot \left(\frac{128\sqrt{6}}{9} N^3 + \frac{32}{3} N^2 (2C_1 + C_2) + \frac{4\sqrt{6}}{3} N (C_1^2 + 2C_1 C_2) + C_1^2 \cdot C_2 \right) ,$$

$$\text{where } C_1 = 2 + \frac{\sqrt{6}}{3} - \frac{2\sqrt{6}}{3} = 2 - \frac{\sqrt{6}}{3} ; \quad C_2 = \frac{\sqrt{6}}{3} - \frac{2\sqrt{6}}{3} = -\frac{\sqrt{6}}{3} .$$

N – the number of layers of SU-4 in the needle of the "hedgehog" 8×4 is defined by the formula:

$$N = \frac{N_{neutrons} + 1}{\frac{8}{\substack{\text{number of needles} \\ \text{in the hedgehog}}} \cdot \frac{4}{\substack{\text{the number of neutrons} \\ \text{in the SU-4}}}}$$

where $N_{neutron}$ – the true number of neutrons in the chemical element (**Summary table of conversions of chemical elements №6**)

$N_{neutron} + 1$ – the theoretical number of neutrons in the chemical element given the shortage of one neutron in protogas (see **Table of conversion No. 1**)

Then

$$V_{hedgehog} = \frac{3\sqrt{3}}{8} d^3 \cdot \left(\frac{\sqrt{6}}{2304} (N_{neutrons} + 1)^3 + \frac{1}{96} (N_{neutrons} + 1)^2 (2C_1 + C_2) + \frac{\sqrt{6}}{24} (N_{neutrons} + 1) (C_1^2 + 2C_1 C_2) + C_1^2 \cdot C_2 \right)$$

The mass of one "hedgehog" is defined by the formula

$$m_{\text{hedgehog}} = \frac{206}{27} \cdot N_{\text{neutrons}} \cdot \frac{3\sqrt{3}}{8} d^3 \cdot \left(\frac{\sqrt{6}}{2304} (N_{\text{neutrons}} + 1)^3 + \frac{1}{96} (N_{\text{neutrons}} + 1)^2 (2C_1 + C_2) + \frac{\sqrt{6}}{24} (N_{\text{neutrons}} + 1) (C_1^2 + 2C_1 C_2) + C_1^2 \cdot C_2 \right)$$

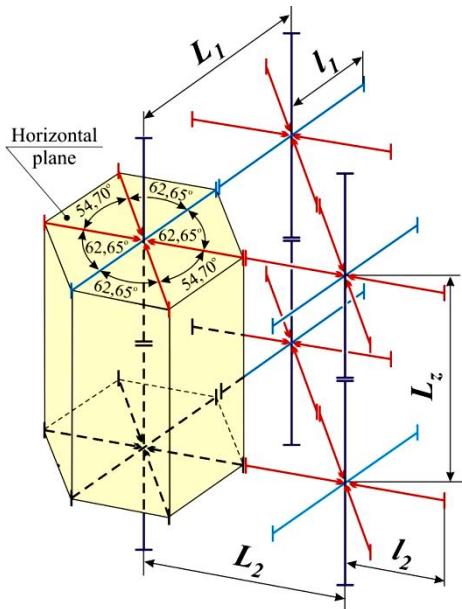


Fig.9. The covalent bond of the "hedgehogs" 8×5

4. The substance consists of "hedgehogs" 8 × 5-SS (solid state) connected by a covalent bond.

The covalent bond of the «hedgehogs» is performed by the coupling of the ends of the last structural units (SU) of the needles. Needles occupy such relative position that the contact of the neutrons in the SU will be maximum ("pentads" of the coupling SU are rotated relative to each other at 45°). Therefore, as dimensions that characterize the "hedgehogs", we take the distance between the centers of the "hedgehogs" L_1 , L_2 , and L_z (see **Fig. 9** – two needles lying in a horizontal plane, which are depicted in blue, have a length l_1 , and four needles which are depicted in red, - the length l_2).

$$l_1 = ((N - 0,5)\sqrt{2} + 1) \cdot d ; \quad l_2 = ((N - 0,5)\sqrt{2} + 1,348) \cdot d ;$$

$$L_1 = 2l_1 + D_5 = ((2N - 1)\sqrt{2} + 2 + 1/\sqrt[4]{4}) \cdot d ;$$

$$L_2 = 2l_2 + D_5 = ((2N - 1)\sqrt{2} + 2,696 + 1/\sqrt[4]{4}) \cdot d ;$$

$$L_z = ((2N - 1)\sqrt{2} + 1/\sqrt[4]{2}) \cdot d ,$$

where d – diameter of the neutron, $d = 0,74 \cdot 10^{-12}$ m, N – the number of layers of SU-5 in the needle of the "hedgehog"; $D_5 = d/\sqrt[4]{2}$ – the distance between the axis of the contacting "quad" of the needles which are in a covalent bond.

$$V_{\text{hedgehog}} = S_{\text{hedgehog}} \cdot L_z ;$$

$$S_{\text{hedgehog}} = 2 \cdot \frac{1}{2} \cdot \frac{L_2}{2} \cdot \frac{L_2}{2} \cdot \sin 54,70^\circ + 4 \cdot \frac{1}{2} \cdot \frac{L_1}{2} \cdot \frac{L_2}{2} \cdot \sin 62,65^\circ = \frac{L_2}{2} \cdot \sin 62,65^\circ (L_2 \cdot \cos 62,65^\circ + L_1)$$

,
because $\sin 54,70^\circ = \sin(180^\circ - 2 \cdot 62,65^\circ) = 2 \sin 62,65^\circ \cos 62,65^\circ$.

$$V_{\text{hedgehog}} = \frac{L_2}{2} \cdot \sin 62,65^\circ (L_2 \cdot \cos 62,65^\circ + L_1) \cdot L_z = \\ = d^3 \cdot \frac{(2N\sqrt{2} + C_2)}{2} \cdot \sin 62,65^\circ ((2N\sqrt{2} + C_2) \cdot \cos 62,65^\circ + (2N\sqrt{2} + C_1)) \cdot (2N\sqrt{2} + C_3)$$

where $C_1 = 2 + 1/\sqrt[4]{2} - \sqrt{2}$; $C_2 = 2,696 + 1/\sqrt[4]{2} - \sqrt{2}$; $C_3 = 1/\sqrt[4]{2} - \sqrt{2}$.

N – the number of layers of SU-5 in the needle of the "hedgehog" 8×5 is defined by the formula:

$$N = \frac{N_{\text{neutrons}} + 1}{\frac{8}{\underset{\substack{\text{number of needles} \\ \text{in the hedgehog}}}{\zeta}} \cdot \frac{5}{\underset{\substack{\text{the number of neutrons} \\ \text{in the SU-5}}}{\zeta}}}$$

where N_{neutrons} – the true number of neutrons in the chemical element (**Summary table of conversions of chemical elements №6**)

$N_{neutron}+1$ – the theoretical number of neutrons in the chemical element given the shortage of one neutron in protogas (see **Table of conversion No. 3**)

Then

$$V_{hedgehog} = d^3 \cdot \frac{\left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_2 \right)}{2} \cdot \sin 62,65^\circ \times \\ \times \left(\left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_2 \right) \cdot \cos 62,65^\circ + \left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_1 \right) \right) \cdot \left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_3 \right)$$

The mass of one "hedgehog" is defined by the formula

$$m_{hedgehog} = \frac{206}{27} \cdot N_{neutrons} \cdot d^3 \cdot \frac{\left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_2 \right)}{2} \cdot \sin 62,65^\circ \times \\ \times \left(\left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_2 \right) \cdot \cos 62,65^\circ + \left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_1 \right) \right) \cdot \left(\frac{(N_{neutrons}+1)}{20} \sqrt{2} + C_3 \right)$$

Plots of $m_{hedgehog}$ on the $N_{neutron}$ for all types of "hedgehogs"-SS shown in **Fig.10**.

Similar calculations can be made also for the "hedgehogs"-gas from tables of conversions of all chemical elements (8 × 4, 4 × 6, 8 × 5, 6 × 5).

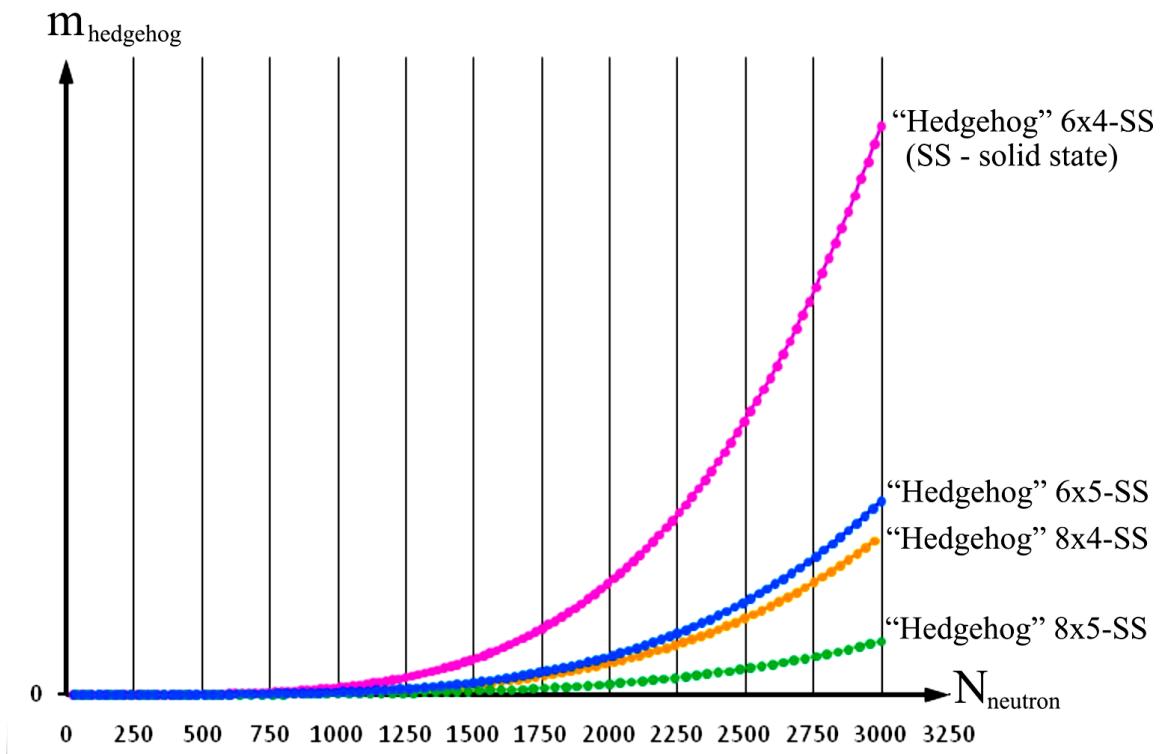


Fig.10. Plots of $m_{hedgehog}$ on the $N_{neutron}$

Below in **Summary table of conversions of chemical elements №6** are shown real gravitational mass of "hedgehogs" of chemical elements on Earth and in **Table №7** – some of the geometric characteristics of the "hedgehogs".

SUMMARY TABLE OF CONVERSIONS OF CHEMICAL ELEMENTS №6

(m substance =1kg)

SU layers	Table 1(8x4)		Table2(6x4)		Table 3(8x5)		Table 4(6x5)		ρtheor	m _{hedgehog} in the grid, kg	Sym bol	Name
	n ⁰	ρgr	n ⁰	ρgr	n ⁰	ρgr	n ⁰	ρgr				
1	2	3	4	5	6	7	8	9	10	11	12	13
1/2	11	84	11	84	14	107	14	107	90	5,96·10 ⁻³⁴	H	Hydrogen▲
1 1/8(6)	27	206	27	206	34	259	34	259	206	6,77·10 ⁻³³	He	Helium▲
3	95	725	71	542	119	908	89	679	534	2,35·10 ⁻³¹	Li	Lithium
4	127	969	95	725	159	1213	119	908	971	6,36·10 ⁻³¹	Na	Sodium
4 3/6(8)	139	1061	107	816	174	1328	134	1022	1026	1,03·10 ⁻³⁰	N	Nitrogen▲
5	159	1213	119	908	199	1518	149	1137	862	1,73·10 ⁻³⁰	K	Potassium
6	191	1457	143	1091					1550	3,12·10 ⁻³⁰	Ca	Calcium
6					239	1823	179	1366	1830	2,8·10 ⁻³⁰	P _{white}	White Phosphorus▲
6 1/6(8)					244	1862	184	1404	1444	3,44·10 ⁻³⁰	Ne	Neon▲
6 1/8(6)	195	1488	147	1122					1469	3,46·10 ⁻³⁰	O	Oxygen▲
7	223	1738	167	1274					1738	5,72·10 ⁻³⁰	Mg	Magnesium
7					279	2129	209	1595	1532	5,62·10 ⁻³⁰	Rb	Rubidium
71/6			171	1305			214	1633	1656	6,17·10 ⁻³⁰	Ar	Argon▲
8	255	1946	191	1457					1959	9,7·10 ⁻³⁰	Cs	Cesium
8					319	2434	239	1823	1848	9,46·10 ⁻³⁰	Be	Beryllium
8 3/8(6)	267	2037	195	1488	334	2548	254	1938	2040	1,19·10 ⁻²⁹	Cl	Chlorine▲
8 7/8(6)	283	2159	211	1610	354	2701	264	2014	2120	1,47·10 ⁻²⁹	F	Fluorine▲
9	287	2190	215	1640					2265	1,54·10 ⁻²⁹	C _{gr}	Carbon (graphite) ▲
9					359	2739	269	2052	2702	1,34·10 ⁻²⁹	P _{bl}	Black Phosphorus▲
10	319	2434	239	1823					2314	2,34·10 ⁻²⁹	B	Boron▲
10					399	3044	299	2281	2223	2,27·10 ⁻²⁹	P _{red}	Red Phosphorus▲
11	351	2678	263	2007	439	3349	329	2510	2698	3,42·10 ⁻²⁹	Al	Aluminum
12	383	2922	287	2190					2085	5,48·10 ⁻²⁹	S ₁	Sulfur -1 ▲
12					479	3655	359	2739	3513	4,12·10 ⁻²⁹	C _{diam}	Carbon (diamond) ▲
13	415	3166	239	2373					2332	7,52·10 ⁻²⁹	Si ₁	Silicon-1▲
13					519	3960	389	2968	2988	6,37·10 ⁻²⁹	Sc	Scandium
13 1/6			315	2403			394	3006	3004	6,7·10 ⁻²⁹	Kr	Krypton▲
15	479	3655	359	2739	599	4570	449	3426	2630	1,33·10 ⁻²⁸	Sr	Strontium
15 3/6			371	2831			464	3540	3571	1,28·10 ⁻²⁸	Xe	Xenon▲
16	511	3899	383	2922	639	4875	479	3655	3594	1,45·10 ⁻²⁸	Ba	Barium
17	543	4143	407	3105	679	5181	509	3883	4073	1,89·10 ⁻²⁸	Br _l	Bromine (liq) ▲
18 1/8(6)	579	4418	435	3319	724	5524	544	4151	4400	2,5·10 ⁻²⁸	Rn _r	Radon (gas) ??
20	639	4875	479	3655	799	6096	599	4570	4504	3,50·10 ⁻²⁸	Ti	Titanium
21	671	5119	503	3838					5000	4,46·10 ⁻²⁸	Ra ₁	Radium-1
21					839	6401	629	4799	4808	4,25·10 ⁻²⁸	Se ₁	Selenium▲
22	703	5364	527	4021	879	6706	659	5028	6694	4,48·10 ⁻²⁸	Sb	Stibium
23	735	5608	551	4204	919	7012	689	5257	6977	5,34·10 ⁻²⁸	Yb	Ytterbium
23 1/6(8)	739	5638	555	4234	924	7050	694	5295*	5245	6,27·10 ⁻²⁸	Eu	Europium
24	767	5852	575	4387	959	7317	719	5486	7194	6,32·10 ⁻²⁸	Cr	Chromium
25	799	6096	599	4570					6000	8,93·10 ⁻²⁸	Ra ₂	Radium -2
25	799	6096	599	4570					4472	1,01·10 ⁻²⁷	Y	Yttrium
25	799	6096	599	4570	999	7622	749	5715	5780	8,48·10 ⁻²⁸	As ₁	Arsenic-1▲
26	831	6340	623	4753	1039	7927	779	5943	5907	9,91·10 ⁻²⁸	Ga	Gallium
27	863	6584	647	4936					4934	1,38·10 ⁻²⁷	I	Iodine▲
27					1079	8232	809	6172	6162	1,15·10 ⁻²⁷	La ₁	Lanthanum-1
28	895	6829	671	5119	1119	8538	839	6401	6769	1,40·10 ⁻²⁷	Pr ₁	Praseodymium-1
29	927	7073	695	5303					7007	1,61·10 ⁻²⁷	Nd	Neodymium-1
29	927	7073	695	5303					5323	1,83·10 ⁻²⁷	Ge ₁	Germanium-1
29					1159	8843	869	6630	8790	1,34·10 ⁻²⁷	Co	Cobalt
30	959	7317	719	5486	1199	9148	899	6859	7260	1,85·10 ⁻²⁷	Pm	Promethium
31	991	7561	743	5669	1239	9453	929	7088	7286	2,10·10 ⁻²⁷	In	Indium
32	1023	7805	767	5852	1279	9758	959	7317	5769	2,71·10 ⁻²⁷	Sn ₁	Stannum-1
33	1055	8049	791	6035	1319	10063	989	7546	6110	3,06·10 ⁻²⁷	V	Vanadium
34	1087	8293	815	6218	1359	10369	1019	7775	6272	3,45·10 ⁻²⁷	Te	Tellurium▲
36	1151	8782	863	6584					6531	4,33·10 ⁻²⁷	Zr	Zirconium
36					1439	10979	1079	8232	8230	3,61·10 ⁻²⁷	Se ₁	Selenium-1
37	1183	9026	887	6767	1479	11284	1109	8461	8630	4,03·10 ⁻²⁷	Nb	Niobium
38	1215	9270	911	6951					9314	4,74·10 ⁻²⁷	Po ₁	Polonium-1
38					1519	11589	1139	8690	8642	4,48·10 ⁻²⁷	Cd	Cadmium

39	1247	9514	935	7134					9523	$5,25 \cdot 10^{-27}$	Po ₂	Polonium-2
39	1247	9514	935	7134					7144	$5,96 \cdot 10^{-27}$	Zn	Zinc
39					1559	11895	1169	8919	8902	$4,97 \cdot 10^{-27}$	Ni	Nickel
41	1311	10002	983	7500	1639	12505	1229	9377	10062	$6,41 \cdot 10^{-27}$	Ac	Actinium
41 1/8(6)	1315	10033	987	7530	1644	12543	1234	9415	7536	$7,40 \cdot 10^{-27}$	Sm ₁	Samarium
42	1343	10247	1007	7683	1679	12810	1259	9606	7469	$8,01 \cdot 10^{-27}$	Mn	Manganese
43	1375	10491	1031	7866					7872	$8,8 \cdot 10^{-27}$	Fe	Ferrum
43					1719	13115	1289	9835*	9800	$7,33 \cdot 10^{-27}$	Bi	Bismuth
44	1407	10735	1055	8049	1759	13421	1319	10063	7895	$9,65 \cdot 10^{-27}$	Gd	Gadolinium
45	1439	10979	1079	8232	1799	13726	1349	10292	8272	$1,06 \cdot 10^{-26}$	Tb ₁	Terbium -1
46					1839	14031	1379	10521	10500	$9,58 \cdot 10^{-27}$	Ag	Argentum
47	1503	11467	1127	8599	1879	14336	1409	10750	11563	$1,11 \cdot 10^{-26}$	Tc	Technetium
47	1503	11467	1127	8599					8559	$1,26 \cdot 10^{-26}$	Dy	Dysprosium
48	1535	11711	1151	8782	1919	14641	1439	10979	11724	$1,20 \cdot 10^{-26}$	Th	Thorium
48 1/6(8)	1539	11742	1155	8812	1924	14679	1444	11017	8799	$1,38 \cdot 10^{-26}$	Ho	Holmium
49	1567	11956	1175	8965	1959	14946	1469	11208	8933	$1,48 \cdot 10^{-26}$	Cu	Cuprum
50	1183	12200	1199	9148	1999	15252	1499	11437	9062	$1,61 \cdot 10^{-26}$	Er	Erbium
51	1631	12444	1223	9331	2039	15557	1529	11666	9318	$1,74 \cdot 10^{-26}$	Tm	Thullium
53	1695	12932	1271	9697	2119	16167	1589	12123	12038	$1,69 \cdot 10^{-26}$	Pd	Palladium
54	1727	13176	1295	9880					9849	$2,18 \cdot 10^{-26}$	Lu	Lutetium
54					2159	16472	1619	12352	12437	$1,82 \cdot 10^{-26}$	Ru	Rhutenium
55	1759	13421	1319	10063	2199	16778	1649	12581	16623	$1,70 \cdot 10^{-26}$	Ta	Tantalum
56	1791	13665	1343	10247	2239	17083	1679	12810	13680	$2,23 \cdot 10^{-26}$	Cm	Curium
56	1791	13665	1343	10247					10220	$2,53 \cdot 10^{-26}$	Mo	Molybdenum
57	1823	13909	1367	10430	2279	17388	1709	13039	13780	$2,39 \cdot 10^{-26}$	Am	Americium
58	1855	14153	1391	10613	2319	17693	1739	13268	13248	$2,41 \cdot 10^{-26}$	Hf	Hafnium
59	1887	14397	1415	10796	2359	17998	1769	13497	14193	$2,67 \cdot 10^{-26}$	Hg	Mercury
62	1983	15130	1487	11345	2479	18914	1859	14183	11340	$3,79 \cdot 10^{-26}$	Pb	Lead
63	2015	15374	1511	11528					15370	$3,56 \cdot 10^{-26}$	Pa	Protactinium
63					2519	19219	1889	14412	19263	$2,92 \cdot 10^{-26}$	W	Wolfram
64	2047	15618	1535	11711	2559	19524	1919	14641	19320	$3,11 \cdot 10^{-26}$	Au	Aurum
65	2079	15862	1559	11895	2599	19829	1949	14870	11870	$4,58 \cdot 10^{-26}$	Tl	Thallium
68	2175	16594	1631	12444	2719	20745	2039	15557	12423	$5,49 \cdot 10^{-26}$	Rh	Rhodium
69	2207	16839	1655	12627	2759	21050	2069	15786	21020	$4,19 \cdot 10^{-26}$	Re	Rhenium
71	2271	17327	1703	12993	2839	21661	2129	16243	21450	$4,7 \cdot 10^{-26}$	Pt	Platinum
73	2335	17815	1751	13359	2919	22271	2189	16701	22400	$5,24 \cdot 10^{-26}$	Ir	Iridium
74	2367	18059	1775	13543	2959	22576	2219	16930	22590	$5,54 \cdot 10^{-26}$	Os	Osmium
78	2495	19036	1871	14275	3119	23797	2339	17845	18950	$8,36 \cdot 10^{-26}$	U	Uranium
81	2591	19768	1943	14824					19816	$9,72 \cdot 10^{-26}$	Pu	Plutonium
83	2655	20257	1991	15191					20250	$1,07 \cdot 10^{-25}$	Np	Neptunium

Note: For the chemical elements Br and Hg data shown in Table 7, are averaged.

Legend:

Curium	Radioactive element according to MP (Modern Physics)
Actinium	Actinoid according to MP (Modern Physics)
Lanthanum	Lanthanide according to MC (Modern Chemistry)
▲	Nonmetals

Gravitational density of substances in the solid state is calculated by formula:

$$\rho(He) = \frac{\rho_{grav}(element)}{N(He)}, \text{ hence } \rho_{grav}(element) = N_{true}(element) \cdot \frac{\rho(He)}{N(He)},$$

where

$\rho_{grav}(element)$ – calculated gravitational density of the given element in the table of conversions (solid state)

$N_{true}(element)$ – true quantity of neutrons in the ‘hedgehog’ of the given element in the solid state

$\rho(He)$ – Helium density in the solid state, being equal $\rho=206 \text{ kg/m}^3$

$N(He)$ – quantity of neutrons in helium ‘hedgehog’ in the solid state, being equal to $N=27$

Table №7 (body mass is equal to 1 kg)

<i>Chemical element</i>	<i>N_{layer}</i>	<i>N_{neutron}</i>	<i>ρ_{grav}, kg/m³</i>	<i>V_{body}, m³</i>	<i>V_{hedgehog}, m³</i>	<i>N hedgehog</i>
H r¹	$\frac{1}{2}$	11	84	$1,19 \cdot 10^{-2}$	$7,10 \cdot 10^{-36}$	$1,68 \cdot 10^{33}$
He r¹	$1\frac{1}{6}$	27	106	$4,85 \cdot 10^{-3}$	$3,29 \cdot 10^{-35}$	$1,49 \cdot 10^{32}$
Li	3	71	542	$1,85 \cdot 10^{-3}$	$4,33 \cdot 10^{-34}$	$4,26 \cdot 10^{30}$
Na	4	127	969	$1,03 \cdot 10^{-3}$	$6,56 \cdot 10^{-34}$	$1,57 \cdot 10^{30}$
N r²	$4\frac{3}{6}$	134	1022	$9,79 \cdot 10^{-4}$	$9,95 \cdot 10^{-34}$	$9,84 \cdot 10^{29}$
K	5	119	908	$1,10 \cdot 10^{-3}$	$1,90 \cdot 10^{-33}$	$5,79 \cdot 10^{29}$
Ca	6	191	1457	$6,86 \cdot 10^{-4}$	$2,14 \cdot 10^{-33}$	$3,21 \cdot 10^{29}$
P _{без}	6	239	1823	$5,49 \cdot 10^{-4}$	$1,54 \cdot 10^{-33}$	$3,57 \cdot 10^{29}$
Ne r¹	$6\frac{1}{6}$	184	1404	$7,12 \cdot 10^{-4}$	$2,45 \cdot 10^{-33}$	$2,91 \cdot 10^{29}$
O r¹	$6\frac{1}{8}$	195	1488	$6,72 \cdot 10^{-4}$	$2,33 \cdot 10^{-33}$	$2,89 \cdot 10^{29}$
Mg	7	223	1738	$5,88 \cdot 10^{-4}$	$3,37 \cdot 10^{-33}$	$1,747 \cdot 10^{29}$
Rb	7	209	1595	$6,27 \cdot 10^{-4}$	$3,52 \cdot 10^{-33}$	$1,78 \cdot 10^{29}$
Ar r¹	$7\frac{1}{6}$	214	1633	$6,124 \cdot 10^{-4}$	$3,78 \cdot 10^{-33}$	$1,62 \cdot 10^{29}$
Cs	8	255	1946	$5,14 \cdot 10^{-4}$	$4,99 \cdot 10^{-33}$	$1,03 \cdot 10^{29}$
Be	8	239	1823	$5,49 \cdot 10^{-4}$	$5,19 \cdot 10^{-33}$	$1,06 \cdot 10^{29}$
Cl r²	$8\frac{3}{8}$	267	2037	$4,91 \cdot 10^{-4}$	$5,85 \cdot 10^{-33}$	$8,39 \cdot 10^{28}$
F r⁴	$8\frac{7}{8}$	283	2159	$4,63 \cdot 10^{-4}$	$6,80 \cdot 10^{-33}$	$6,81 \cdot 10^{28}$
P _{чеп}	9	359	2739	$3,65 \cdot 10^{-4}$	$4,9 \cdot 10^{-33}$	$7,45 \cdot 10^{28}$
C	9	287	2190	$4,57 \cdot 10^{-4}$	$7,05 \cdot 10^{-33}$	$6,47 \cdot 10^{28}$
B	10	319	2434	$4,11 \cdot 10^{-4}$	$9,63 \cdot 10^{-33}$	$4,27 \cdot 10^{28}$
P _{kp}	10	299	2281	$4,38 \cdot 10^{-4}$	$9,94 \cdot 10^{-33}$	$4,41 \cdot 10^{28}$
Al	11	351	2678	$3,73 \cdot 10^{-4}$	$1,28 \cdot 10^{-32}$	$2,93 \cdot 10^{28}$
C _{ажм}	12	479	3655	$2,74 \cdot 10^{-4}$	$1,13 \cdot 10^{-32}$	$2,43 \cdot 10^{28}$
S ₁	12	287	2190	$4,57 \cdot 10^{-4}$	$2,5 \cdot 10^{-32}$	$1,83 \cdot 10^{28}$
Si ₁	13	311	2373	$4,21 \cdot 10^{-4}$	$3,17 \cdot 10^{-32}$	$1,33 \cdot 10^{28}$
Sc	13	389	2968	$3,37 \cdot 10^{-4}$	$2,15 \cdot 10^{-32}$	$1,57 \cdot 10^{28}$
Kr r¹	$13\frac{1}{6}$	394	3006	$3,33 \cdot 10^{-4}$	$2,23 \cdot 10^{-32}$	$1,49 \cdot 10^{28}$
Sr	15	359	2739	$3,65 \cdot 10^{-4}$	$4,85 \cdot 10^{-32}$	$7,53 \cdot 10^{27}$
Xe r²	$15\frac{3}{6}$	464	3540	$2,83 \cdot 10^{-4}$	$3,61 \cdot 10^{-32}$	$7,84 \cdot 10^{27}$
Ba	16	479	3655	$2,74 \cdot 10^{-4}$	$3,96 \cdot 10^{-32}$	$6,91 \cdot 10^{27}$
Br	17	534,5	4078	$2,54 \cdot 10^{-4}$	$4,88 \cdot 10^{-32}$	$5,35 \cdot 10^{27}$
Rn r¹	18	579	4418	$2,26 \cdot 10^{-4}$	$5,66 \cdot 10^{-32}$	$4,0 \cdot 10^{27}$
Ti	20	599	4570	$2,19 \cdot 10^{-4}$	$7,66 \cdot 10^{-32}$	$2,86 \cdot 10^{27}$
Se ₁	21	629	4799	$2,08 \cdot 10^{-4}$	$8,85 \cdot 10^{-32}$	$2,36 \cdot 10^{27}$
Ra ₁	21	671	5119	$1,95 \cdot 10^{-4}$	$8,71 \cdot 10^{-32}$	$2,24 \cdot 10^{27}$
Sb	22	879	6706	$1,49 \cdot 10^{-4}$	$6,68 \cdot 10^{-32}$	$2,23 \cdot 10^{27}$
Yb	23	919	7012	$1,426 \cdot 10^{-4}$	$7,61 \cdot 10^{-32}$	$1,87 \cdot 10^{27}$
Cr	24	959	7317	$1,367 \cdot 10^{-4}$	$8,63 \cdot 10^{-32}$	$1,58 \cdot 10^{27}$
Eu r¹	$23\frac{1}{6}$	694	5295	$1,89 \cdot 10^{-4}$	$1,18 \cdot 10^{-31}$	$1,60 \cdot 10^{27}$
Ra ₂	25	799	6096	$1,64 \cdot 10^{-4}$	$1,46 \cdot 10^{-31}$	$1,12 \cdot 10^{27}$
As	25	749	5715	$1,75 \cdot 10^{-4}$	$1,48 \cdot 10^{-31}$	$1,18 \cdot 10^{27}$
Gd	26	779	5943	$1,68 \cdot 10^{-4}$	$1,67 \cdot 10^{-31}$	$1,01 \cdot 10^{27}$
La ₁	27	809	6172	$1,62 \cdot 10^{-4}$	$1,86 \cdot 10^{-31}$	$8,69 \cdot 10^{26}$
Y	25	599	4570	$2,19 \cdot 10^{-4}$	$2,22 \cdot 10^{-31}$	$9,87 \cdot 10^{26}$
I	27	647	4936	$2,03 \cdot 10^{-4}$	$2,79 \cdot 10^{-31}$	$7,27 \cdot 10^{26}$
Pr ₁	28	895	6829	$1,46 \cdot 10^{-4}$	$2,05 \cdot 10^{-31}$	$7,13 \cdot 10^{26}$
Nd	29	927	7073	$1,41 \cdot 10^{-4}$	$2,28 \cdot 10^{-31}$	$6,2 \cdot 10^{26}$
Co	29	1159	8843	$1,13 \cdot 10^{-4}$	$1,51 \cdot 10^{-31}$	$7,49 \cdot 10^{26}$
Ge ₁	29	695	5303	$1,89 \cdot 10^{-4}$	$3,45 \cdot 10^{-31}$	$5,47 \cdot 10^{26}$
Pm	30	959	7313	$1,367 \cdot 10^{-4}$	$2,52 \cdot 10^{-31}$	$5,42 \cdot 10^{26}$

In	31	991	7561	$1,32 \cdot 10^{-4}$	$2,78 \cdot 10^{-31}$	$4,75 \cdot 10^{26}$
Sn ₁	32	767	5852	$1,71 \cdot 10^{-4}$	$4,63 \cdot 10^{-31}$	$3,69 \cdot 10^{26}$
V	33	791	6035	$1,66 \cdot 10^{-4}$	$5,08 \cdot 10^{-31}$	$3,27 \cdot 10^{26}$
Te	34	815	6218	$1,61 \cdot 10^{-4}$	$5,55 \cdot 10^{-31}$	$2,9 \cdot 10^{26}$
Zr	36	863	6584	$1,52 \cdot 10^{-4}$	$6,58 \cdot 10^{-31}$	$2,31 \cdot 10^{26}$
Ce ₁	36	1079	8232	$1,215 \cdot 10^{-4}$	$4,39 \cdot 10^{-31}$	$2,77 \cdot 10^{26}$
Nb	37	1109	8461	$1,18 \cdot 10^{-4}$	$4,76 \cdot 10^{-31}$	$2,48 \cdot 10^{26}$
Cd	38	1139	8690	$1,15 \cdot 10^{-4}$	$5,15 \cdot 10^{-31}$	$2,23 \cdot 10^{26}$
Ni	39	1169	8919	$1,12 \cdot 10^{-4}$	$5,57 \cdot 10^{-31}$	$2,01 \cdot 10^{26}$
Po ₁	38	1215	9270	$1,079 \cdot 10^{-4}$	$5,11 \cdot 10^{-31}$	$2,11 \cdot 10^{26}$
Po ₂	39	1247	9514	$1,051 \cdot 10^{-4}$	$5,52 \cdot 10^{-31}$	$1,90 \cdot 10^{26}$
Zn	39	935	7134	$1,4 \cdot 10^{-4}$	$8,36 \cdot 10^{-31}$	$1,68 \cdot 10^{26}$
Ac	41	1311	10002	$9,998 \cdot 10^{-5}$	$6,41 \cdot 10^{-31}$	$1,56 \cdot 10^{26}$
Sm ₁ ^{r1}	41 1/6	987	7530	$1,33 \cdot 10^{-4}$	$9,83 \cdot 10^{-31}$	$1,35 \cdot 10^{26}$
Mn	42	1007	7683	$1,3 \cdot 10^{-4}$	$1,04 \cdot 10^{-30}$	$1,25 \cdot 10^{26}$
Fe	43	1031	7866	$1,27 \cdot 10^{-4}$	$1,12 \cdot 10^{-30}$	$1,14 \cdot 10^{26}$
Bi	43	1289	9835	$1,017 \cdot 10^{-4}$	$7,45 \cdot 10^{-31}$	$1,37 \cdot 10^{26}$
Gd	44	1055	8049	$1,24 \cdot 10^{-4}$	$1,20 \cdot 10^{-30}$	$1,04 \cdot 10^{26}$
Tb ₁	45	1079	8232	$1,215 \cdot 10^{-4}$	$1,28 \cdot 10^{-30}$	$9,48 \cdot 10^{25}$
Ag	46	1379	10521	$9,51 \cdot 10^{-5}$	$9,11 \cdot 10^{-31}$	$1,04 \cdot 10^{26}$
Te	47	1503	11467	$8,72 \cdot 10^{-5}$	$9,65 \cdot 10^{-31}$	$9,04 \cdot 10^{25}$
Th	48	1535	11711	$8,54 \cdot 10^{-5}$	$1,03 \cdot 10^{-30}$	$8,31 \cdot 10^{25}$
Dy	47	1127	8599	$1,16 \cdot 10^{-4}$	$1,46 \cdot 10^{-30}$	$7,97 \cdot 10^{25}$
Ho ^{r1}	48 1/6	1155	8812	$1,135 \cdot 10^{-4}$	$1,57 \cdot 10^{-30}$	$7,22 \cdot 10^{25}$
Cu	49	1175	8965	$1,115 \cdot 10^{-4}$	$1,65 \cdot 10^{-30}$	$6,75 \cdot 10^{25}$
Er	50	1199	9148	$1,09 \cdot 10^{-4}$	$1,76 \cdot 10^{-30}$	$6,22 \cdot 10^{25}$
Tm	51	1223	9331	$1,07 \cdot 10^{-4}$	$1,86 \cdot 10^{-30}$	$5,75 \cdot 10^{25}$
Pd	53	1589	12123	$8,25 \cdot 10^{-5}$	$1,39 \cdot 10^{-30}$	$5,93 \cdot 10^{25}$
Ru	54	1619	12352	$8,10 \cdot 10^{-5}$	$1,47 \cdot 10^{-30}$	$5,51 \cdot 10^{25}$
Lu	54	1295	9880	$1,01 \cdot 10^{-4}$	$2,21 \cdot 10^{-30}$	$4,58 \cdot 10^{25}$
Ta	55	2199	16778	$5,96 \cdot 10^{-5}$	$1,01 \cdot 10^{-30}$	$5,89 \cdot 10^{25}$
Mo	56	1343	10247	$9,76 \cdot 10^{-5}$	$2,47 \cdot 10^{-30}$	$3,96 \cdot 10^{25}$
Cm	56	1791	13665	$7,32 \cdot 10^{-5}$	$1,63 \cdot 10^{-30}$	$4,49 \cdot 10^{25}$
Am	57	1823	13909	$7,19 \cdot 10^{-5}$	$1,72 \cdot 10^{-30}$	$4,19 \cdot 10^{25}$
Hf	58	1739	13268	$7,54 \cdot 10^{-5}$	$1,82 \cdot 10^{-30}$	$4,14 \cdot 10^{25}$
Hg	59	1857,5	14172	$7,29 \cdot 10^{-5}$	$1,99 \cdot 10^{-30}$	$3,80 \cdot 10^{25}$
Pb	62	1487	11345	$8,81 \cdot 10^{-5}$	$3,34 \cdot 10^{-30}$	$2,64 \cdot 10^{25}$
Pa	63	2015	15374	$6,50 \cdot 10^{-5}$	$2,32 \cdot 10^{-30}$	$2,81 \cdot 10^{25}$
W	63	2519	19219	$5,20 \cdot 10^{-5}$	$1,52 \cdot 10^{-30}$	$3,43 \cdot 10^{25}$
Au	64	2559	19524	$5,12 \cdot 10^{-5}$	$1,59 \cdot 10^{-30}$	$3,22 \cdot 10^{25}$
Tl	65	1559	11895	$8,41 \cdot 10^{-5}$	$3,85 \cdot 10^{-30}$	$2,18 \cdot 10^{25}$
Rh	68	1631	12444	$8,04 \cdot 10^{-5}$	$4,41 \cdot 10^{-30}$	$1,82 \cdot 10^{25}$
Re	69	2759	21050	$4,75 \cdot 10^{-5}$	$1,99 \cdot 10^{-30}$	$2,39 \cdot 10^{25}$
Pt	71	2839	21661	$4,62 \cdot 10^{-5}$	$2,17 \cdot 10^{-30}$	$2,13 \cdot 10^{25}$
Ir	73	2919	22271	$4,49 \cdot 10^{-5}$	$2,36 \cdot 10^{-30}$	$1,91 \cdot 10^{25}$
Os	74	2959	22576	$4,43 \cdot 10^{-5}$	$2,45 \cdot 10^{-30}$	$1,81 \cdot 10^{25}$
U	78	2495	19036	$5,25 \cdot 10^{-5}$	$4,39 \cdot 10^{-30}$	$1,20 \cdot 10^{25}$
Pu	81	2591	19768	$5,06 \cdot 10^{-5}$	$4,92 \cdot 10^{-30}$	$1,03 \cdot 10^{25}$
Np	83	2655	20257	$4,937 \cdot 10^{-5}$	$5,29 \cdot 10^{-30}$	$9,33 \cdot 10^{24}$

Note: 1. For the chemical elements Br and Hg data shown in Table 7, are averaged.
2. ρ_{grav} is the calculated gravitational density of the given element in the tables of conversions (solid state)

VERIFICATION OF AVOGADRO'S LAW

Avogadro's law: «*Equal volumes of gaseous substance at the similar pressure and temperature contain the same number of molecules, so the gas density is a measure of the mass of their molecules».*

Determine the number of molecules of known gases in a volume of 22.4 liters under normal conditions, that is, verify the statement of the law of Avogadro and his constant ($N_A=6,022 \cdot 10^{23} \text{ mol}^{-1}$).

We calculated the mass of the "hedgehogs" of the chemical elements $m_{\text{hedgehogs}}$. All known gases are diatomic molecules, so the mass of one molecule of gas equal

$$m_{\text{molecule}} = 2 m_{\text{hedgehogs}}.$$

Knowing the density of the gas under normal conditions ρ_{gas} , we can determine the mass of gas in a volume of 22.4 liters using the formula

$$m_{\text{gas}} = \rho_{\text{gas}} \cdot 22,4 \cdot 10^{-3} (\text{kg}).$$

The number of gas molecules contained in a volume of 22.4 liters under normal conditions, define by the formula:

$$N_{\text{molecule}} = \frac{m_{\text{gas}}}{m_{\text{molecule}}} = \frac{\rho_{\text{gas}} \cdot 22,4 \cdot 10^{-3}}{2 \cdot m_{\text{hedgehog}}}.$$

According to the above formula we will calculate the number of molecules of simple gases and will put them in a table.

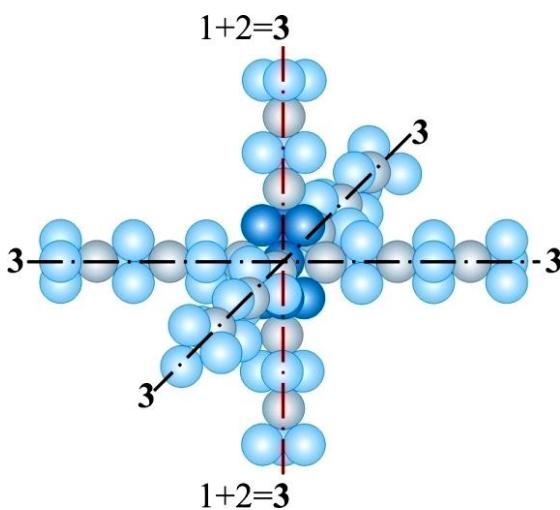
Chemical element	$m_{\text{hedgehogs}}, \text{kg}$	Gas	$\rho_{\text{gas}}, \text{kG/m}^3$	N_{molecule}
H (6×4)	$5,96 \cdot 10^{-34}$	H_2	$8,988 \cdot 10^{-2}$	$1,69 \cdot 10^{30}$
He (6×4)	$6,77 \cdot 10^{-33}$	He_2	$1,785 \cdot 10^{-1}$	$2,95 \cdot 10^{29}$
N (6×5)	$1,02 \cdot 10^{-30}$	N_2	$1,2506$	$1,38 \cdot 10^{28}$
Ne (6×5)	$3,44 \cdot 10^{-30}$	Ne_2	$9,0035 \cdot 10^{-1}$	$2,93 \cdot 10^{27}$
O (8×4)	$3,46 \cdot 10^{-30}$	O_2	$1,429$	$4,62 \cdot 10^{27}$
Ar (6×5)	$6,17 \cdot 10^{-30}$	Ar_2	$1,7839$	$3,24 \cdot 10^{27}$
Cl (8×4)	$1,19 \cdot 10^{-29}$	Cl_2	$3,214$	$3,03 \cdot 10^{27}$
F (8×4)	$1,47 \cdot 10^{-29}$	F_2	$1,693$	$1,29 \cdot 10^{27}$
Kr (6×5)	$6,7 \cdot 10^{-29}$	Kr_2	$3,745$	$6,26 \cdot 10^{26}$
Xe^{g2} (6×5)	$1,28 \cdot 10^{-28}$	Xe_2	$5,851$	$5,13 \cdot 10^{26}$
Rn (8×4)	$2,50 \cdot 10^{-28}$	Rn_2	$9,73$	$4,36 \cdot 10^{26}$

This result shows that under normal conditions the number of molecules of a gas contained in a volume of 22.4 liters, is not constant $N_A=6,022 \cdot 10^{23} \text{ mol}^{-1}$.

Therefore Avogadro's law is not the law!

Accordingly, **the universal gas constant $R = k \cdot N_A = 8,31 \cdot \text{J}/(\text{mol} \cdot \text{K})$** , where $k = 1,38 \cdot 10^{-23} \text{ J/K}$ is the Boltzmann's constant, **is not constant and depends on the type of gas.**

Let us consider a cell from **Table 2** of chemical elements conversions with chemical element Lithium as an example (see **Fig.11** and **Fragment of Table of Conversions 2**)



Solid state (physical state of the element)	
3 (atomic number)	
Li²_{ss} (symbol) Lithium (name)	71 (actual quantity of neutrons in the element) -1 (neutron deficit in protogas)
534 (roentgen density in solid state, kg/m ³)	72 (theoretical number of neutrons)
542 (gravitational density in solid state, kg/m ³)	3 (number of layers of structural units (SU) in the hedgehog's needles)
7.1 (relative neutron mass M)	18 (number of SU-quads without neutron deficit)

Fig.11. Six-pointed 'hedgehog' with quad-based needles. Lithium – 'solid state'

Fragment of Table of Conversions 2 (6x4). LITHIUM.

gas-1		liquid-1		gas-2		liquid-2		gas-3		solid state	
3											
Li²_{gas1}	51	Li²_{liq1}	55	Li²_{gas2}	59	Li²_{liq2}	63	Li²_{gas3}	67	Li²_{ss} Lithium	71
	-1		-1		-1		-1		-1		-1
	52		56		60		64		68	534	72
389	$2 \frac{1}{6}$	420	$2 \frac{2}{6}$	450	$2 \frac{3}{6}$	481	$2 \frac{4}{6}$	511	$2 \frac{5}{6}$	542	3
5.1	13	5.5	14	5.9	15	6.3	16	6.7	17	7.1	18