Unbihexium $^{310}_{126}Ubh/^{354}_{126}Ubh$ or orion nucleus $^{307}_{125}Or$?

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Abstract. The structure of the nuclei begins with the so-called lower-order nuclei, as the deuterium, tritium and helium ^3_2He, which evolve into helium nucleus ^4_2He and then first upper-order oxygen nucleus $^{16}_8O$. The second upper-order calcium nucleus $^{40}_{20}Ca$ is based on the fundamental natural phenomenon of mirror symmetry, by repetition of the first upper-order oxygen nucleus and one half of it, i.e. at the 2,5 factor. The same stands with the third upper-order tin nucleus $^{120}_{50}Sn$, which emerged from the second upper-order calcium nucleus, according to the mirror symmetry and the same 2,5 factor. Furthermore, orion nucleus $^{307}_{125}Or$ forecast, as a theoretical construction, is derived by repetition of the third upper-order tin nucleus and one half of it for the connection as the fourth upper-order nucleus, according to the mirror symmetry. The atomic numbers Z of the above four upper-order nuclei are the so-called four magic numbers, i.e. $Z_1 = 8$, $Z_2 = 8 \cdot 2,5 = 20$, $Z_3 = 20 \cdot 2,5 = 50$ and $Z_4 = 50 \cdot 2,5 = 125$. That is the simple and elegant structure model, according to which the nuclei consist of fixed helium nuclei ^4_2He (plus deuterium, tritium and helium ^3_2He, all evolving into helium ^4_2He) and neutrons rotating around of them. It is noted that the word orion comes from the Greek $\acute{o}\varrho\iota o\nu$, meaning the limit. Thus, orion nucleus $^{307}_{125}Or$ means the limited nucleus of Nature that cannot be further divided, due to the indivisible original deuterium. Additionally, orion nucleus $^{307}_{125}O_r$ is the corresponding hypothetical chemical element with atomic number $Z = 126$ and placeholder symbol Ubh ($^{310}_{126}Ubh$ or $^{354}_{126}Ubh$), also known as element 126 or eka-plutonium.

Keywords: Upper-order nuclei; mirror symmetry; magic numbers.

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1. Structure model of four upper-order nuclei

According to the unified theory[1,2] of dynamic space the atomic nuclei[3,4] have been structured through two fundamental phenomena.[5] The inverse electric field[6] of the proton and the electric entity of the macroscopically neutral neutron.[7]

The structure of the nuclei begins with the so-called lower-order nuclei, as the deuterium ^2_1H, tritium ^3_1H and helium ^3_2He, which evolve into helium ^4_2He[5] and then first upper-order oxygen nucleus $^{16}_{8}O$,[8] that has four helium nuclei $^{4}_{2}He$ in a column of strong negative electric field (Fig. 1).

So, the second upper-order calcium nucleus $^{40}_{20}Ca$[9] is based on the fundamental natural phenomenon of mirror symmetry, by repetition of the first upper-order oxygen nucleus and one half of it, i.e. at the 2,5 factor (Fig. 2). The same stands with the third upper-order tin nucleus $^{120}_{50}Sn$,[10] which emerged from the second upper-order calcium nucleus, according to the mirror symmetry and the same 2,5 factor (Figs 3 and 4).

Furthermore, orion nucleus $^{307}_{125}Or$ forecast, as a theoretical construction, is derived by repetition of the tin nucleus $^{120}_{50}Sn$ and one half of it for the connection as the fourth upper-order nucleus, according to the mirror symmetry.

The atomic numbers Z of the above four upper-order nuclei are the so-called four magic numbers, i.e. $Z_1 = 8$, $Z_2 = 8{\cdot}2,5 = 20$, $Z_3 = 20{\cdot}2,5 = 50$ and $Z_4 = 50{\cdot}2,5 = 125$, according to the 2,5 factor. It is noted that, this orion nucleus $^{307}_{125}O_r$ with an atomic number $Z_4 = 125$ is the corresponding hypothetical unbihexium $^{310}_{126}Ubh$ or $^{354}_{126}Ubh$ with a different atomic number $Z = 126$.

Additionally, the tin nucleus $^{120}_{50}Sn$ will further form the basis for the structure of all heavy nuclei up to the radioactive uranium nucleus $^{235}_{92}U$.[11]

That is the simple and elegant structure model, according to which the nuclei consist of fixed helium nuclei $^{4}_{2}He$ (plus deuterium, tritium and helium $^{3}_{2}He$, all evolving into helium $^{4}_{2}He$) and neutrons rotating around of them.

1.1. Structure model of first upper-order oxygen nucleus $^{16}_{8}O$

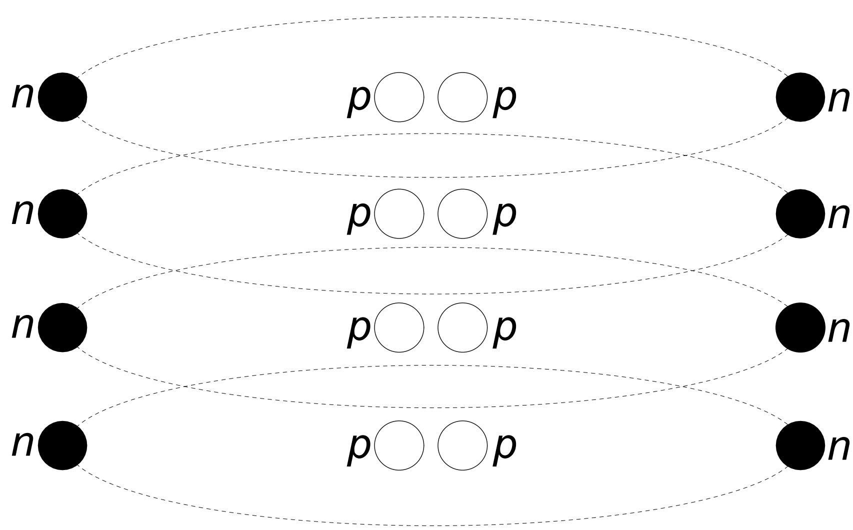

Figure 1. Structure model of oxygen $^{16}_{8}O = 4^{4}_{2}H_e$, as a column of strong electric field of four coaxial helium nuclei $^{4}_{2}H_e$

Oxygen nucleus $^{16}_{8}O$ is derived from the successive evolution[8] of lithium $^{6}_{3}Li =^{4}_{2} H_e +^{2}_{1} H$, lithium $^{7}_{3}Li =^{6}_{3} Li + n$, beryllium $^{9}_{4}Be =^{7}_{3} Li +^{2}_{1} H$, boron $^{10}_{5}B =^{4}_{2} H_e + 3^{2}_{1}H$, boron $^{11}_{5}B =^{4}_{2} H_e +^{3}_{2} H_e +^{3}_{1} H + n$, carbon $^{12}_{6}C = 3^{4}_{2}H_e$ and nitrogen $^{14}_{7}N =^{12}_{6} C +^{2}_{1} H$ by completing of one deuterium $^{2}_{1}H$, evolving into carbon $^{12}_{6}C$ and helium $^{4}_{2}H_e$, that are four coaxial helium nuclei $^{4}_{2}H_e$ as a column of strong negative electric field[6] (Fig. 1)

$$^{16}_{8}O =^{14}_{7} N +^{2}_{1} H =^{12}_{6} C +^{4}_{2} H_e = 4^{4}_{2}H_e \Rightarrow^{16}_{8} O = 4^{4}_{2}H_e. \tag{1}$$

After the helium nucleus $^{4}_{2}H_e$, the oxygen nucleus $^{16}_{8}O$ is the second stable one in Nature and the first upper-order one, which the atomic number $Z = 8$ is the first magic number.

1.2. Structure model of second upper-order calcium nucleus $^{40}_{20}Ca$

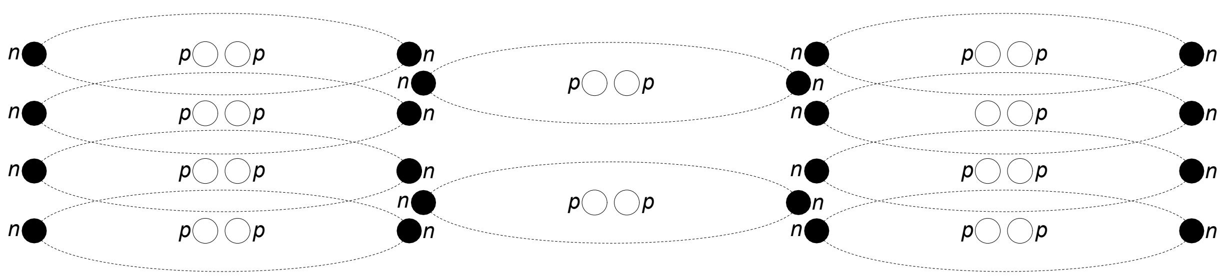

Figure 2. Structure model of calcium nucleus $^{40}_{20}Ca =^{16}_{8} O + 2^{4}_{2}He +^{16}_{8} O$, as a mirror symmetry of two oxygen nuclei $^{16}_{8}O$ and two helium nuclei $^{4}_{2}He$ (one half oxygen), according to the 2, 5 factor

Calcium nucleus $^{40}_{20}Ca$ (Fig. 2) is derived from the successive evolution[9] of the nuclei fluorine $^{19}_{9}F =^{16}_{8} O +^{3}_{1} H$, magnesium $^{24}_{12}Mg =^{16}_{8} O + 2^{4}_{2}He$, silicon $^{28}_{14}Si =^{16}_{8} O + 3^{4}_{2}He$ and specifically

$$^{40}_{20}Ca =^{16}_{8} O + \frac{1}{2} \cdot^{16}_{8} O +^{16}_{8} O, \tag{2}$$

i.e. by repetition of the oxygen nucleus $^{16}_{8}O$ and one half of it for connection as the second upper-order nucleus, according to the mirror symmetry. The atomic number $Z = 8 \cdot 2,5 = 20$ (2, 5 factor) of the calcium nucleus $^{40}_{20}Ca$ is the second magic number.

1.3. Structure model of third upper-order tin nucleus $^{120}_{50}Sn$

Tin nucleus $^{120}_{50}S_n$ (Figs 3 and 4) is derived from the successive evolution[10] of the nuclei iron $^{56}_{26}Fe =^{40}_{20} Ca + 3^{4}_{2}He + 4n$, nickel $^{60}_{28}Ni =^{40}_{20} Ca + 4^{4}_{2}He + 4n$ and specifically

$$^{120}_{50}S_n =^{40}_{20} C_a + \frac{1}{2} \cdot^{40}_{20} C_a +^{40}_{20} C_a + 20n, \tag{3}$$

i.e. by repetition of the calcium nucleus $^{40}_{20}C_a$ and one half of it for connection as the third upper-order nucleus, according to the mirror symmetry, while twenty orbital bonding neutrons[12] are added, which reduce the strong negativity of the protons field and contribute to the stability of the nucleus. The atomic number $Z = 20 \cdot 2,5 = 50$ (2, 5 factor) of the tin nucleus $^{120}_{50}S_n$ is the third magic number.

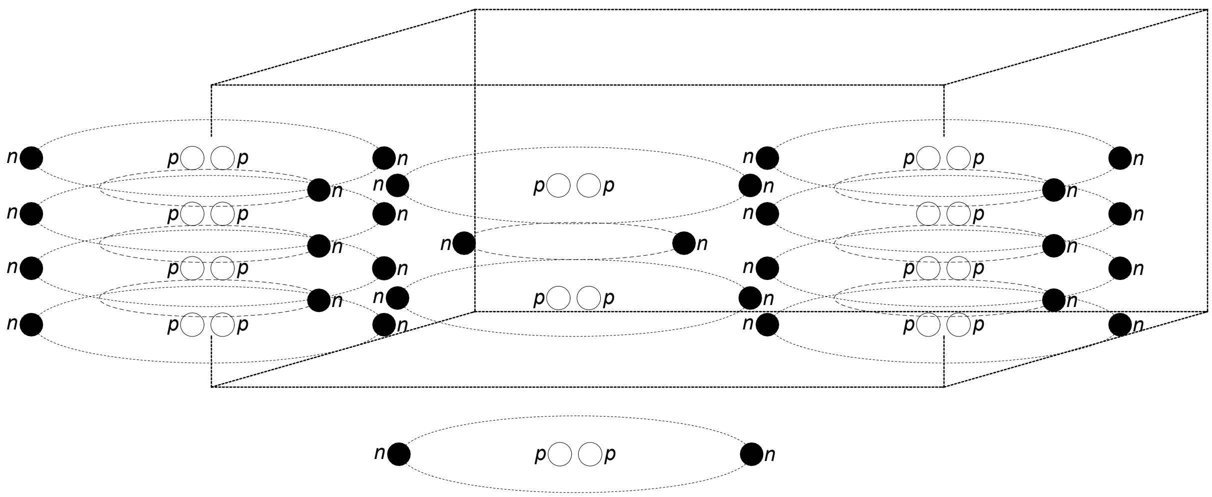

Figure 3. Stereoscopic representation of the tin nucleus $^{120}_{50}Sn$, where the same image on the other three sides of the rectangular parallelepiped is repeated, while the lonely helium nucleus $^{4}_{2}He$ is placed in its center

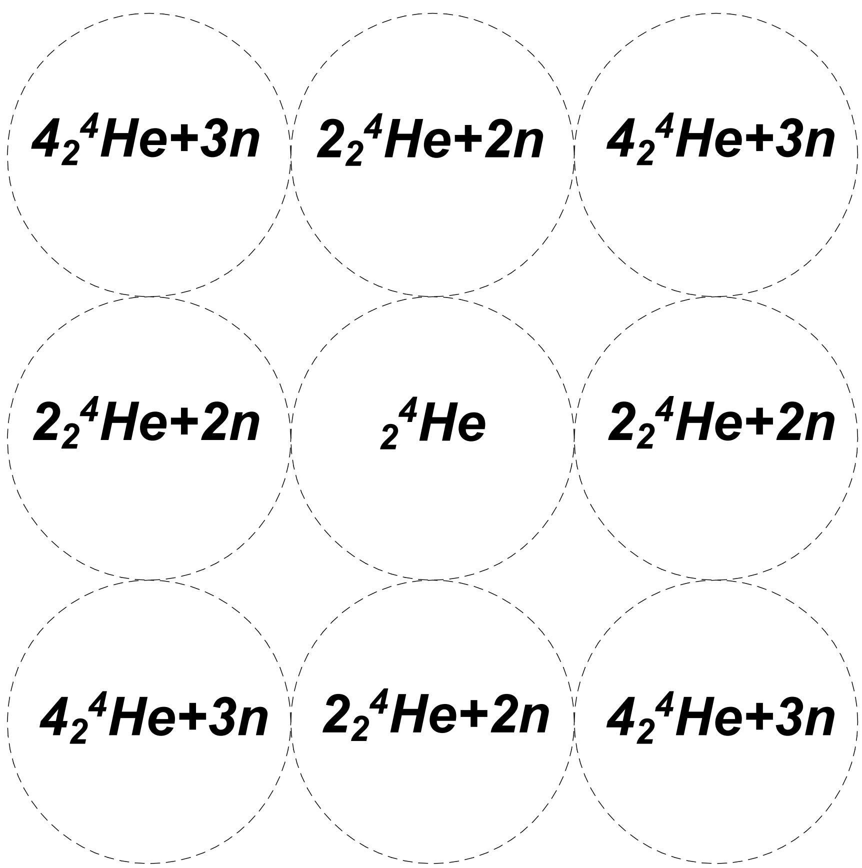

Figure 4. Top view of Fig. 1, where the mirror symmetry of the 2,5 factor for the construction of the tin nucleus $^{120}_{50}Sn$ appears

In Fig. 3 it is repeated the same image on the other three sides of the rectangular parallelepiped, while the lonely helium nucleus $^{4}_{2}He$ of the above figure is placed in its center. In Fig. 4, the four corner columns of negative potential appear with the four helium nuclei ${}^{4}_{2}He$ and the three neutrons each, also the four middle columns of negative potential appear with the two helium nuclei ${}^{4}_{2}He$ and the two neutrons each, while the lonely helium nucleus ${}^{4}_{2}He$ appears in the center.

1.4. Structure model of fourth upper-order orion nucleus ${}^{307}_{125}Or$

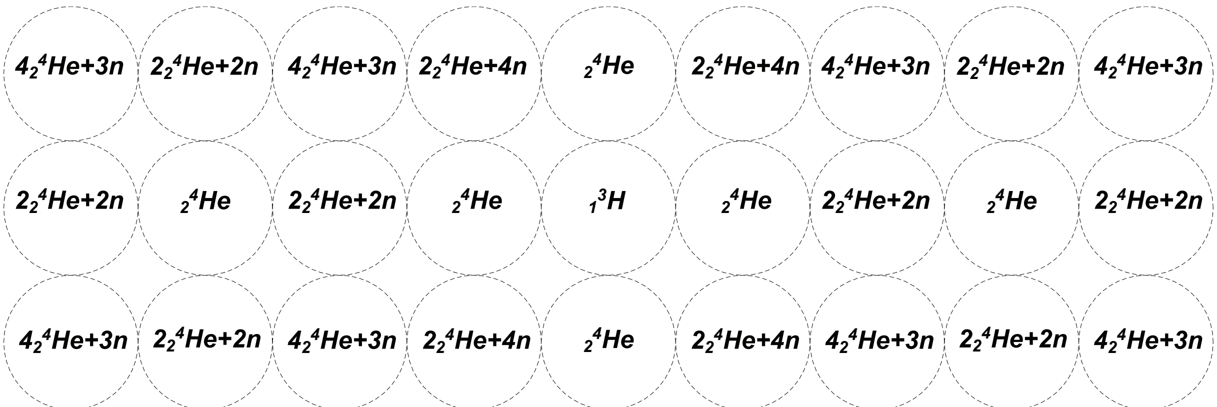

Figure 5. Representation of the fourth upper-order orion nucleus ${}^{307}_{125}Or$, where is constructed by repetition of the third upper-order tin nucleus ${}^{120}_{50}Sn$ and one half of it for the connection (mirror symmetry/2,5 factor)

Orion nucleus ${}^{307}_{125}Or$ forecast, as a theoretical construction (Fig. 5), is derived from the successive evolution[11] of the nuclei tin ${}^{120}_{50}Sn$ (Eq. 3), iodine ${}^{127}_{53}I ={}^{120}_{50} Sn + 2{}^{2}_{1}H +{}^{3}_{1} H$, rhenium ${}^{187}_{75}Re ={}^{120}_{50} Sn+\frac{1}{2}\cdot{}^{120}_{50}Sn+6n+n$, lead ${}^{208}_{82}Pb ={}^{187}_{75} Re+3{}^{4}_{2}He+{}^{3}_{1}H+6n$, bismuth ${}^{209}_{83}Bi ={}^{187}_{75} Re+4{}^{4}_{2}He+6n$, uranium ${}^{235}_{92}U ={}^{209}_{83} Bi+({}^{4}_{2}He+{}^{3}_{1}H+n)+(2{}^{4}_{2}He+2{}^{3}_{1}H+4n)$ and specifically

$$ {}^{307}_{125}Or ={}^{120}_{50} Sn + \frac{1}{2}\cdot{}^{120}_{50} Sn +{}^{120}_{50} Sn + 6n + n, \tag{4}$$

i.e. by the repetition of the tin nucleus ${}^{120}_{50}Sn$ and one half of it for the connection as the fourth upper-order nucleus, according to the mirror symmetry, while six orbital bonding neutrons[12] in the middle connection unit $(\frac{1}{2}\cdot{}^{120}_{50} Sn)$ are added plus one neutron for the central original deuterium nucleus ${}^{2}_{1}H$ (one half of the initial helium nucleus ${}^{4}_{2}He$) that evolves into the unstable tritium nucleus ${}^{3}_{1}H$ (Fig. 5).

The weak link of orion nucleus ${}^{307}_{125}Or$ is the above unstable tritium nucleus ${}^{3}_{1}H$, which is located at its center, where the strong negative electric field of the protons prevails. So, this critical point becomes an attraction pole of neutrons, i.e. of a thermal neutron and rarely of a fast one, which it is cleaved (beta decay β^-), incorporating the produced proton into the tritium nucleus ${}^{3}_{1}H$, turning it into helium nucleus ${}^{4}_{2}He$. This is the mechanism that acts as a catalyst for the nuclear fission of the theoretical orion nucleus ${}^{307}_{125}Or$, due to which it is considered an unstable nucleus.

The atomic number (2, 5 factor)

$$Z = 50 \cdot 2,5 = 125 \tag{5}$$

of the hypothetical orion nucleus ${}^{307}_{125}Or$ is the fourth magic number.

The orbital bonding neutrons are formed as the sum shown in Fig. 5 plus the above one neutron of the unstable tritium nucleus ${}^{3}_{1}H$, namely

$$20 + 16 + 20 + 1 = 57. \tag{6}$$

Hence, the mass number of orion nucleus ${}^{307}_{125}Or$, due to Eq. 5, will be then

$$A = 2Z + 57 = 2 \cdot 125 + 57 = 307 \Rightarrow A = 307. \tag{7}$$

However, we will give also an etymological interpretation for orion ${}^{307}_{125}Or$. The word orion comes from the Greek *όριον*, meaning the limit. Thus, orion nucleus ${}^{307}_{125}Or$ means the limited nucleus of Nature that cannot be further divided, due to the indivisible original deuterium ${}^{2}_{1}H$.

Additionally, orion nucleus ${}^{307}_{125}O_r$ is the corresponding hypothetical chemical element with atomic number $Z = 126$ and placeholder symbol Ubh (${}^{310}_{126}Ubh$ or ${}^{354}_{126}Ubh$), also known as element 126 or eka-plutonium.

2. References

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