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 $^2_1H$, which evolve into helium nucleus $^4_2He$ and then first upper-order oxygen nucleus $^{18}_8O$. 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 $^2_1H$ (plus deuterium, tritium and helium $^2_1H_e$, all evolving into helium $^4_2He$) and neutrons rotating around of them. It is noted that the word orion comes from the Greek ὀϱιον, 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 $^{307}_{125}Or$ 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 $^4_2He$ and then
first upper-order oxygen nucleus $^{16}_8O$, that has four helium nuclei $^4_2He$ in a column of strong negative electric field (Fig. 1).

So, 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 (Fig. 2). 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 (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. $Z_1 = 8$, $Z_2 = 8·2$, $5 = 20$, $Z_3 = 20·2$, $5 = 50$ and $Z_4 = 50·2$, $5 = 125$, according to the 2,5 factor. It is noted that, this orion nucleus $^{307}_{125}Or$ 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 $^{235}_{92}U$.

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.

1.1. Structure model of first upper-order oxygen nucleus $^{16}_8O$

![Figure 1](image-url)
Oxygen nucleus $^{16}_8O$ is derived from the successive evolution of lithium $^6_3Li = ^4_2H_e + ^2_1H$, lithium $^7_3Li = ^3_3Li + n$, beryllium $^9_4Be = ^7_3Li + ^1_1H$, boron $^{10}_5B = ^2_2H_e + ^3_1H$, boron $^{11}_5B = ^1_2H_e + ^3_2H_e + ^1_1H + n$, carbon $^{12}_6C = ^4_2H_e$ and nitrogen $^{14}_7N = ^{12}_6C + ^2_1H$ by completing of one deuterium $^1_1H_e$, evolving into carbon $^{16}_6C$ and helium $^4_2H_e$, that are four coaxial helium nuclei $^4_2H_e$ as a column of strong negative electric field (Fig. 1)

$$^{16}_8O = ^4_2H_e + ^2_4He = ^{14}_7N + ^2_4He = ^{12}_6C + ^2_2H_e,$$ (1)

After the helium nucleus $^4_2H_e$, the oxygen nucleus $^{16}_8O$ 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 $^{40}_{20}Ca$

 Calcium nucleus $^{40}_{20}Ca$ (Fig. 2) is derived from the successive evolution of the nuclei fluorine $^{19}_9F = ^{16}_8O + ^3_1H$, magnesium $^{24}_{12}Mg = ^{16}_8O + ^2_4He$, silicon $^{28}_{14}Si = ^{16}_8O + ^{14}_2He$ and specifically

$$^{40}_{20}Ca = ^{16}_8O + ^1_2(2)^{16}_8O + ^{16}_8O,$$ (2)

i.e. by repetition of the oxygen nucleus $^{16}_8O$ 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 $^{120}_{50}Sn$ (Figs 3 and 4) is derived from the successive evolution of the nuclei iron $^{56}_{26}Fe = ^{40}_{20}Ca + ^{24}_2He + 4n$, nickel $^{60}_{28}Ni = ^{40}_{20}Ca + ^{44}_2He + 4n$ and specifically

$$^{120}_{50}Sn = ^{40}_{20}Ca + ^1_2^{40}_{20}Ca + ^{40}_{20}Ca + 20n,$$ (3)

i.e. by repetition of the calcium nucleus $^{40}_{20}Ca$ and one half of it for connection as the third upper-order nucleus, according to the mirror symmetry, while twenty orbital bonding neutrons 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 $^{120}_{50}Sn$ 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 $^4_2He$ 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 $^4_2He$ 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 $^4\text{He}$ and the three neutrons each, also the four middle columns of negative potential appear with the two helium nuclei $^4\text{He}$ and the two neutrons each, while the lonely helium nucleus $^4\text{He}$ appears in the center.

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

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

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

i.e. by the repetition of the tin nucleus $^{120}_{50}\text{Sn}$ 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 ($\frac{1}{2}^{120}_{50}\text{Sn}$) are added plus one neutron for the central original deuterium nucleus $^2\text{H}$ (one half of the initial helium nucleus $^4\text{He}$) that evolves into the unstable tritium nucleus $^3\text{H}$ (Fig. 5).

The weak link of orion nucleus $^{307}_{125}\text{Or}$ is the above unstable tritium nucleus $^3\text{H}$, 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 $\beta^-$), incorporating the produced proton into the tritium nucleus $^3\text{H}$, turning it into helium nucleus $^4\text{He}$. This is the mechanism that acts as a catalyst for the nuclear fission of the theoretical orion nucleus $^{307}_{125}\text{Or}$, due to which it is considered an unstable nucleus.

The atomic number (2, 5 factor)

$$Z = 50 \cdot 2, 5 = 125$$

(5)
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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 $^3_1H$, namely

$$20 + 16 + 20 + 1 = 57.$$  \hspace{0.5cm} (6)

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

$$A = 2Z + 57 = 2 \cdot 125 + 57 = 307 \Rightarrow A = 307.$$  \hspace{0.5cm} (7)

However, we will give also an etymological interpretation for orion $^{307}_{125}Or$. The word orion comes from the Greek ὀριον, 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 $^2_1H$.

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

2. References