Formulas of the Fine-structure Constant Based on the 92th Element Uranium and Prediction of the 126th Element

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Dedicated to Prof. Albert Sun-Chi Chan on the occasion of his 70th birthday

Abstract

In our previous papers, we gave many formulas of the fine-structure constant based on some critical nuclide numbers such as 112, 173, 137, 83, 29 and 103. In this paper, we give the general formulas of the fine-structure constant and some formulas of the fine-structure constant based on the 92th element Uranium. These formulas relate to $_{92}$U-235/238 and predict $_{126}$Ch$_{188}$ (the most stable isotope of the 126th element).

Keywords: formulas; the fine-structure constant; the 92th element; Uranium.

1. Introduction

In our previous papers[1-9], we gave many formulas of the fine structure constant and their applications or relevant developments. The two most typical formulas and the general formulas of the fine-structure constant are as follows.

$$\alpha_1 = \frac{36}{7\cdot(2\pi)_{Chen-112}}\frac{1}{112+\frac{1}{75^2}} = 1/137.035999037435$$

$$\alpha_2 = \frac{13\cdot(2\pi)_{Chen-278}}{100}\frac{1}{112-\frac{1}{64\cdot3\cdot29}} = 1/137.035999111818$$

$$2\pi - e \text{ formula: } (2\pi)_{Chen\text{-}k} = \left(\frac{e}{e^{\gamma_{c-k}}}\right)^2 = e^2\frac{e^2}{(\frac{2}{1})^3}\frac{e^2}{(\frac{3}{2})^5}\frac{e^2}{(\frac{4}{3})^7}\cdots\frac{e^2}{(\frac{k+1}{k})^{2k+1}}$$

$$\alpha_1 = f_1(ZNA)\frac{1}{Z_{critical}+\delta_1} = \frac{n}{m(2\pi)_k}\frac{1}{Z_{critical}+\delta_1} = 1/137.035999037435$$

$$\alpha_2 = f_2(ZNA)\frac{1}{Z_{critical}-\delta_2} = \frac{m(2\pi)_k}{n}\frac{1}{Z_{critical}-\delta_2} = 1/137.035999111818$$

$Z\ N\ A$ refer to numbers of proton, neutron and neucleon of nuclide $^{A}_{Z}X_{N}$

$Z_{critical}$ is defined as a critical nuclide number such as 112, 173, 137, 83, 29, 103 and 92. m and n are integers which relate to nuclides, it would be better if they contain squared integer number factors because 2π is essentially a squared number according to 2π-e formula. δ_1 and δ_2 is minor fractional numbers which factors also relate to nuclides. $Z_{critical}$ corresponds to some critical nuclides as follows (**Table 1**).

Table 1. $Z_{critical}$ and its corresponding critical nuclides.

$Z_{critical}$	Nuclide	Particularity
112	$_{112}Cn_{173}$	the natural end of elements
173	$_{173}Ch_{262}$	the ideal extended end of elements
137	$_{137}Fy_{209}$	the maximum of hydrogen-like atoms
83	$_{83}Bi_{126}$	the end of stable elements
29	$_{29}Cu_{34,36}$	the critical point of $N/Z=(3/2)^{0.5}$
103	$_{70}Yb_{103}$	with nucleon number of 173
	$_{103}Lr_{159}$	with nucleon number of 262
92	$_{92}U_{143,146}$	the end of primordial elements

$(2\pi)_k$ refers to the following expressions.

$$(2\pi)_{\textit{Chen-k}} = \left(\frac{e}{e^{\gamma_{c-k}}}\right)^2 = e^2 \frac{e^2}{(\frac{2}{1})^3} \frac{e^2}{(\frac{3}{2})^5} \frac{e^2}{(\frac{4}{3})^7} \cdots \frac{e^2}{(\frac{k+1}{k})^{2k+1}}$$

$$(2\pi)_{\textit{Wallis-k}} = 2\frac{2}{3}\frac{4}{3}\frac{4}{5}\frac{6}{5}\frac{6}{7}\frac{8}{7}\cdots\frac{2k}{2k+1}\frac{2k+2}{2k+1}$$

$$(2\pi)_{\textit{GL-k}} = 1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\cdots+\frac{1}{2\cdot k+1}$$

GL means Gregory-Leibniz

$$(2\pi)_{\textit{NC-k}} = 6+\sum_{n=1}^{k}\frac{(-1)^{n+1}}{n(n+1/2)(n+1)}$$

NC means Nilakantha-Chen

2. The General Formulas of the Fine-structure Constant

For nuclide $^{A}_{Z}X_{N}$,

$Z\ N\ A$ represent numbers of proton, neutron and neucleon of nuclide $^{A}_{Z}X_{N}$.

Richard Feynman noticed:

For a hydrogen-like atom with Z protons and only one electron ($^{A}_{Z}XH_{N}$),

according to Bohr model, the line velocity of the ground state electron $v_{e/Z}$ satisfies:

$$\frac{v_{e/z}}{c} = \frac{Ze^2}{4\pi\varepsilon_0\hbar c} = Z\alpha,\ \text{as } v_{e/z} \le c,\ \ \alpha = \frac{v_{e/z}}{c}\frac{1}{Z} \approx \frac{1}{Z_{\max-H-like}} = \frac{1}{Fy} = \frac{1}{137}$$

In brief, $\alpha \approx \frac{1}{Z_{\max-H-like}} = \frac{1}{Fy} = \frac{1}{137}$, *Fy* means Feynmanium.

The 137th hydrogen-like element Fy is an ideal (imaginative) element

In reality, the above formula should be modified to:

$$\alpha = F(ZNA) = f(ZNA)\frac{1}{Z_{critical} \pm \delta}$$

$\alpha = F(ZNA)$, this could be concluded from the following typical nuclides:

${}^{50,51}_{23}V_{27,28}$ ${}^{80}_{34}Se_{46}$ ${}^{100}_{44}Ru_{56}$ ${}^{118,119}_{50}Sn_{68,69}$ ${}^{136,137,138}_{56}Ba_{80,81,82}$ ${}^{168}_{68}Er_{100}$ ${}^{169}_{69}Tm_{100}$ ${}^{209}_{83}Bi^{*}_{126}$ ${}^{209}_{84}Po^{*}_{125}$

${}^{222}_{86}Rn^{*}_{136}$ ${}^{223}_{87}Fr^{*}_{136}$ ${}^{226}_{88}Ra^{*}_{138}$ ${}^{227}_{89}Ac^{*}_{138}$ ${}^{257}_{100}Fm^{*}_{157}$ ${}^{285}_{112}Cn^{*}_{173}$ ${}^{2\cdot157}_{126}Ch^{ie}_{188}$ ${}^{344,2\cdot173,348}_{136,137,138}Fy^{ie}_{208,209,210}$

Note: $136 = 8\cdot17$, $138 = 6\cdot23$; 56 is the most stable number in nuclides; $2\pi \approx \frac{4\cdot157}{100}$

These indicate that: $\alpha \approx 1/137.036$ expresses as 136, 137 and 138 in nuclides, and α relates to $Z\,NA$ numbers of nuclides, so α is a function of $Z\;N\;A$ or $\alpha = F(Z\,NA)$.

Compared to $\alpha = \frac{\lambda_e}{2\pi a_0}$, the formula of α should have a 2π factor:

$$\alpha_1 = \frac{\lambda_e}{2\pi a_0} = F_1(ZNA) = f_1(ZNA)\frac{1}{Z_{critical} + \delta_1} = \frac{n}{m(2\pi)_k}\frac{1}{Z_{critical} + \delta_1}$$

Compared to $\alpha = \frac{2\pi r_e}{\lambda_e}$, the formula of α should have a 2π factor:

$$\alpha_2 = \frac{2\pi r_e}{\lambda_e} = F_2(ZNA) = f_2(ZNA)\frac{1}{Z_{critical} - \delta_2} = \frac{m(2\pi)_k}{n}\frac{1}{Z_{critical} - \delta_2}$$

m n k δ should relate to $Z\,NA$ numbers of nuclides.

3. Specific Characteristics of the 92th Element Uranium

The 92th element Uranium is the end of primordial elements in the earth (**Fig 1** and **2**) because it has relative stability among all radioactive elements.

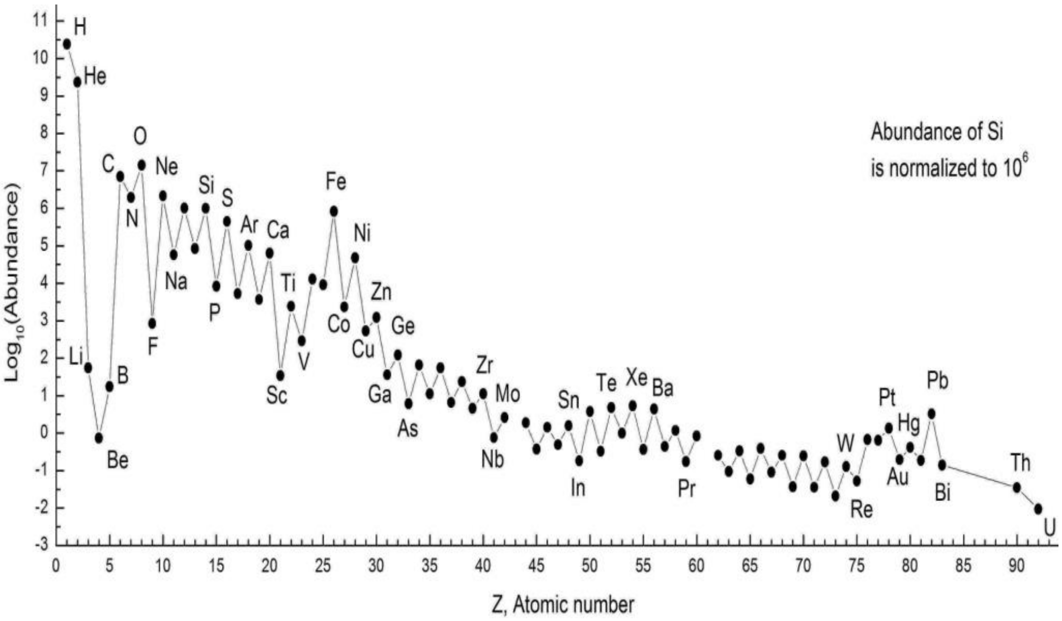

Fig. 1. Graph of Abundance of Elements in the Universe

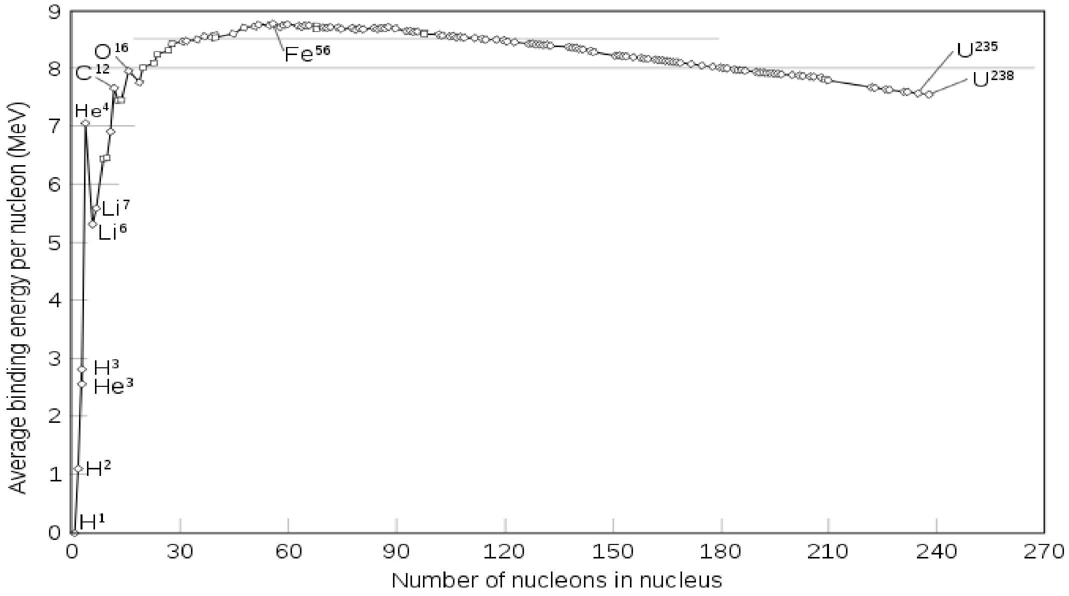

Fig. 2. Graph of Stability of Nuclides

The process of nuclear fission of U-235 shows 92, 56 and 47 are special stable numbers in nuclides (**Fig. 3**).

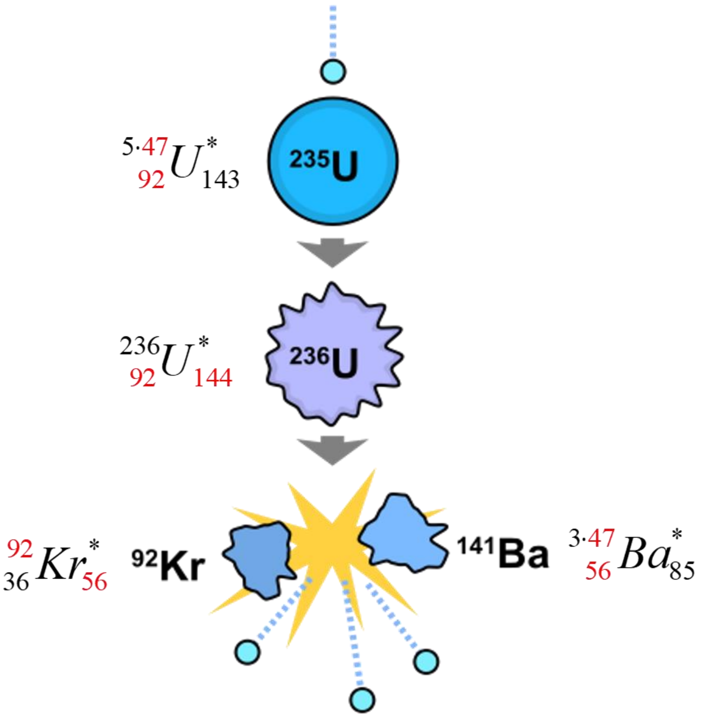

Fig. 3. The Process of Nuclear Fission of U-235

The two most stable isotopes of Uranium are listed as follows (**Table 2**).

Table 2. The two most stable isotopes of Uranium

Isotopes	Z	N	A	Half-Life	Natural Abundance
U-235	92=4×23	143=11×13	235=5×47	7.0×10^{8} yr	0.71%
U-238	92=4×23	143=2×73	238=14×17	4.5×10^{9} yr	99.28%

The reason why U-235 and U-238 are relatively stable is mainly because 92 (4×23), 235 (5×47) and 238 (14×17) are special referring to the following formulas.

$$136 = 8\cdot 17,\ 138 = 6\cdot 23,\ 56 = 4\cdot 14,\ 112 = 8\cdot 14,\ 168 = 12\cdot 14$$

$$c_{au} = \frac{c}{v_e} = \frac{1}{\alpha_c} = \frac{1}{\sqrt{\alpha_1\alpha_2}} = \sqrt{112\times(168 - \frac{1}{3} + \frac{1}{12\cdot 47} - \frac{1}{14\cdot 112\cdot(2\cdot 173+1)})}$$

$$= 137.035999074626$$

As the 92th element Uranium is so special, 92 should be a critical nuclide number (Z_{critical}), so we can construct some formulas of the fine-structure constant based on it.

4. Formulas of the Fine-structure Constant based on the 92th Element Uranium

$$\alpha_1 = \frac{2\cdot 19}{9\cdot e^2 \frac{e^2}{(\frac{2}{1})^3}\frac{e^2}{(\frac{3}{2})^5}\frac{e^2}{(\frac{4}{3})^7}\cdots\frac{e^2}{(\frac{2\cdot 89}{3\cdot 59})^{5\cdot 71}}}\frac{1}{92 + \frac{1}{7\cdot 25\cdot 19} - \frac{3\cdot 7\cdot(8\cdot 7\cdot 137+1)}{25\cdot 10^{11}}}$$

$$= 1/137.035999037435$$

${}^{19}_{9}F_{10}$ ${}^{36,38,40}_{18}Ar_{18,20,22}$ ${}^{79,81}_{35}Br_{44,46}$ ${}^{105}_{46}Pd_{59}$ ${}^{137}_{56}Ba_{81}$ ${}^{175,176}_{71}Lu_{104,105}$ ${}^{227}_{89}Ac^{*}_{138}$ ${}^{285}_{112}Cn^{*}_{173}$ ${}^{346}_{137}Fy^{ie}_{209}$

$$\alpha_1 = \frac{27\cdot 5}{32\cdot e^2 \frac{e^2}{(\frac{2}{1})^3}\frac{e^2}{(\frac{3}{2})^5}\frac{e^2}{(\frac{4}{3})^7}\cdots\frac{e^2}{(\frac{2\cdot 23\cdot 31}{3\cdot 25\cdot 19})^{2851}}}\frac{1}{92 + \frac{1}{9\cdot 5\cdot 31\cdot(2\cdot 27\cdot 11-1)}}$$

$$= 1/137.035999037435$$

${}^{16,17,18}_{8}O_{8,9,10}$ ${}^{19}_{9}F_{10}$ ${}^{23}_{11}Na_{12}$ ${}^{31}_{15}P_{16}$ ${}^{32,33,34,36}_{16}S_{16,17,18,20}$ ${}^{39,40,41}_{19}K_{20,21,22}$ ${}^{46,47,48,49,50}_{22}Ti_{24,25,26,27,28}$

${}^{50,51}_{23}V_{27,28}$ ${}^{55}_{25}Mn_{30}$ ${}^{57}_{26}Fe_{31}$ ${}^{59}_{27}Co_{32}$ ${}^{69,71}_{31}Ga_{38,40}$ ${}^{70,72}_{32}Ge_{38,40}$ ${}^{80}_{34}Se_{46}$ ${}^{92,94,96}_{40}Zr_{52,54,56}$

${}^{108,110}_{46}Pd_{62,64}$ ${}^{135,136,137,138}_{56}Ba_{79,80,81,82}$ ${}^{155,156,157,160}_{64}Gd_{91,92,93,96}$

2021/6/1

$$\alpha_1 = \frac{27\cdot 5}{128\cdot(2\frac{2}{3}\frac{4}{3}\frac{4}{5}\frac{6}{5}\cdots\frac{4276}{4277}\frac{2\cdot 3\cdot 23\cdot 31}{2\cdot 2\cdot(2\cdot 5\cdot 107-1)+1})}\frac{1}{92 + \frac{1}{27\cdot 109\cdot(2\cdot 3\cdot 47-1) - \frac{2}{7}}}$$

$$= 1/137.035999037435$$

${}^{31}_{15}P_{16}$ ${}^{50,51}_{23}V_{27,28}$ ${}^{59}_{27}Co_{32}$ ${}^{69,71}_{31}Ga_{38,40}$ ${}^{82,83,84}_{36}Kr_{46,47,48}$ ${}^{92,94,96}_{40}Zr_{52,54,56}$ ${}^{105,108,110}_{46}Pd_{59,62,64}$

${}^{107,109}_{47}Ag_{60,62}$ ${}^{3\cdot 47}_{59}\mathrm{Pr}_{82}$ ${}^{154,155,156,157,158,160}_{64}Gd_{90,91,92,93,94,96}$ ${}^{5\cdot 47,238}_{92}U^{*}_{143,146}$ ${}^{270}_{107}Bh^{*}_{163}$

$$\alpha_1 = \frac{27\cdot 5}{256\cdot(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \cdots + \frac{1}{2\cdot 2\cdot(16\cdot 5\cdot 17+1)+1})}\frac{1}{92 + \frac{13\cdot(4\cdot 5\cdot 23+1)}{25\cdot 10^{10}}}$$

$$= 1/137.035999037435$$

${}^{27}_{13}Al_{14}$ ${}^{50,51}_{23}V_{27,28}$ ${}^{59}_{27}Co_{32}$ ${}^{90,91,92,94,96}_{40}Zr_{50,51,52,54,56}$ ${}^{118,119}_{50}Sn_{68,69}$ ${}^{156,160}_{64}Gd_{92,96}$ ${}^{168}_{68}Er_{100}$

2021/6/2

$$\alpha_1=\frac{27\cdot5}{32\cdot(6+\sum_{n=1}^{9}\frac{(-1)^{n+1}}{n(n+1/2)(n+1)})}\frac{1}{92+\frac{1}{2\cdot3\cdot47+1}-\frac{1}{4\cdot9\cdot(2\cdot11\cdot109+1)+\frac{14}{17}}}$$

$$=\frac{27\cdot5}{32\cdot(6+\sum_{n=1}^{9}\frac{(-1)^{n+1}}{n(n+1/2)(n+1)})}\frac{1}{92+\frac{1}{2\cdot3\cdot47+1}-\frac{1}{5\cdot23\cdot(16\cdot47-1)-\frac{3}{17}}}$$

$=1/137.035999037435$

${}^{23}_{11}Na_{12}$ ${}^{35,37}_{17}Cl_{18,20}$ ${}^{46,47,48,49,50}_{22}Ti_{24,25,26,27,28}$ ${}^{50,51}_{23}V_{27,28}$ ${}^{59}_{27}Co_{32}$ ${}^{82,83,84}_{36}Kr_{46,47,48}$ ${}^{92,94,96}_{40}Zr_{52,54,56}$

${}^{105}_{46}Pd_{59}$ ${}^{107,109}_{47}Ag_{60,62}$ ${}^{3\cdot47}_{59}\mathrm{Pr}_{82}$ ${}^{156,157,158,160}_{64}Gd_{92,93,94,96}$ ${}^{4\cdot47}_{76}Os_{112}$ ${}^{5\cdot47,14\cdot17}_{92}U^{*}_{143,146}$ ${}^{2\cdot157}_{126}Ch^{ie}_{4\cdot47}$

2021/6/3

$$\alpha_2=\frac{11\cdot e^2\frac{e^2}{(\frac{2}{1})^3}\frac{e^2}{(\frac{3}{2})^5}\frac{e^2}{(\frac{4}{3})^7}\cdots\frac{e^2}{(\frac{9\cdot37}{4\cdot83})^{5\cdot7\cdot19}}}{103}\frac{1}{92-\frac{1}{3\cdot5\cdot7\cdot97}+\frac{16\cdot17\cdot37}{25\cdot10^{11}}}$$

$=1/137.035999111818$

${}^{19}_{9}F_{10}$ ${}^{23}_{11}Na_{12}$ ${}^{35,37}_{17}Cl_{18,20}$ ${}^{83}_{36}Kr_{47}$ ${}^{85,87}_{37}Rb_{48,50}$ ${}^{143,145,146}_{60}Nd_{83,85,86}$ ${}^{163}_{66}Dy_{97}$ ${}^{173}_{70}Yb_{103}$ ${}^{235,238}_{92}U^{*}_{143,146}$

$$\alpha_2=\frac{25\cdot e^2\frac{e^2}{(\frac{2}{1})^3}\frac{e^2}{(\frac{3}{2})^5}\frac{e^2}{(\frac{4}{3})^7}\cdots\frac{e^2}{(\frac{2\cdot11\cdot67}{3\cdot(2\cdot5\cdot49+1)})^{7\cdot(4\cdot3\cdot5\cdot7+1)}}}{2\cdot9\cdot13}\frac{1}{92-\frac{1}{4\cdot9\cdot(2\cdot3\cdot19\cdot37+1)+\frac{6}{7}}}$$

$=1/137.035999111818$

${}^{19}_{9}F_{10}$ ${}^{23}_{11}Na_{12}$ ${}^{24,25,26}_{12}Mg_{12,13,14}$ ${}^{27}_{13}Al_{14}$ ${}^{36,38,40}_{18}Ar_{18,20,22}$ ${}^{39}_{19}K_{20}$ ${}^{46,47,48,49,50}_{22}Ti_{24,25,26,27,28}$

${}^{54,56,57}_{26}Fe_{28,30,31}$ ${}^{55}_{25}Mn_{30}$ ${}^{69,71}_{31}Ga_{38,40}$ ${}^{66,67,68,70}_{30}Zn_{36,37,38,40}$ ${}^{85,87}_{37}Rb_{48,50}$ ${}^{89}_{39}Y_{50}$ ${}^{113,115}_{49}In_{64,66}$

${}^{114,116,117,120,122,124}_{50}Sn_{64,66,67,70,72,74}$ ${}^{165}_{67}Ho_{98}$ ${}^{195,196}_{78}Pt_{117,118}$

2021/6/1

$$\alpha_2=\frac{50\cdot(2\frac{2}{3}\frac{4}{3}\frac{4}{5}\frac{6}{5}\cdots\frac{4418}{4419}\frac{4\cdot5\cdot13\cdot17}{2\cdot47^2+1})}{9\cdot13}\frac{1}{92-\frac{1}{2\cdot79\cdot(4\cdot3\cdot(2\cdot3\cdot47+1)-1)}}$$

$=1/137.035999111818$

${}^{27}_{13}Al_{14}$ ${}^{35,37}_{17}Cl_{18,20}$ ${}^{47}_{22}Ti_{25}$ ${}^{78,80}_{34}Se_{44,46}$ ${}^{79,81}_{35}Br_{44,46}$ ${}^{82,83,86}_{36}Kr_{46,47,50}$ ${}^{89}_{39}Y_{50}$ ${}^{100}_{44}Ru_{56}$ ${}^{107,109}_{47}Ag_{60,62}$

${}^{117,118}_{50}Sn_{67,68}$ ${}^{3\cdot47}_{59}Pr_{82}$ ${}^{135,136,137,138}_{56}Ba_{79,80,81,82}$ ${}^{156,157,158}_{64}Gd_{92,93,94}$ ${}^{168}_{68}Er_{100}$ ${}^{169}_{69}Tm_{100}$ ${}^{195}_{78}Pt_{117}$

${}^{197}_{79}Au_{118}$ ${}^{5\cdot47,14\cdot17}_{92}U^{*}_{11\cdot13,146}$ ${}^{257}_{100}Fm^{*}_{157}$ ${}^{2\cdot157}_{126}Ch^{ie}_{4\cdot47}$

2021/6/2

$$\alpha_2 = \frac{100\cdot(1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\cdots+\frac{1}{2\cdot2\cdot3\cdot7\cdot67+1})}{9\cdot13}\frac{1}{92-\frac{1}{2\cdot23\cdot(4\cdot3\cdot(16\cdot17-1)+1)+\frac{2}{5}}}$$

$$=1/137.035999111818$$

${}^{27}_{13}Al_{14}$ ${}^{35,37}_{17}Cl_{18,20}$ ${}^{54,56,58}_{26}Fe_{28,30,32}$ ${}^{50,51}_{23}V_{27,28}$ ${}^{78,80,82}_{34}Se_{44,46.48}$ ${}^{89}_{39}Y_{50}$ ${}^{115,117,118,119}_{50}Sn_{65,67,68,69}$ ${}^{136,137,138}_{56}Ba_{80,81,82}$ ${}^{168}_{68}Er_{100}$ ${}^{169}_{69}Tm_{100}$ ${}^{195}_{78}Pt_{177}$

$$\alpha_2 = \frac{25\cdot(6+\sum_{n=1}^{9}\frac{(-1)^{n+1}}{n(n+1/2)(n+1)})}{2\cdot9\cdot13}\frac{1}{92-\frac{1}{2\cdot157}+\frac{1}{2\cdot7\cdot17\cdot19\cdot29-\frac{7}{22}}}$$

$$=1/137.035999111818$$

${}^{19}_{9}F_{10}$ ${}^{23}_{11}Na_{12}$ ${}^{27}_{13}Al_{14}$ ${}^{28,29,30}_{14}Si_{14,15,16}$ ${}^{35,37}_{17}Cl_{18,20}$ ${}^{39,41}_{19}K_{20,22}$ ${}^{46,47,48,50}_{22}Ti_{24,25,26,28}$ ${}^{54,56,58}_{26}Fe_{28,30,32}$ ${}^{63,65}_{29}Cu_{34,36}$ ${}^{89}_{39}Y_{50}$ ${}^{114,115,116,117,118,119}_{50}Sn_{64,65,66,67,68,69}$ ${}^{156,157}_{64}Gd_{92,93}$ ${}^{195}_{78}Pt_{177}$ ${}^{5\cdot47,14\cdot17}_{92}U^{*}_{11\cdot13,146}$ ${}^{257}_{100}Fm^{*}_{157}$ ${}^{2\cdot157}_{126}Ch^{ie}_{4\cdot47}$ ${}^{400}_{157}Ch^{ie}_{243}$

2021/6/3

5. Two Typical Formulas of the Fine-structure Constant based on the 92th Element Uranium

Among the above formulas of the fine-structure constant based on the 92th element Uranium, two are more meaningful and listed as follows.

$$\alpha_1 = \frac{27\cdot5}{32\cdot(2\pi)_{NC-9}}\frac{1}{92+\frac{1}{2\cdot3\cdot47+1}-\frac{1}{4\cdot9\cdot(2\cdot11\cdot109+1)+\frac{14}{17}}}$$

$$=\frac{27\cdot5}{32\cdot(2\pi)_{NC-9}}\frac{1}{92++\frac{1}{2\cdot3\cdot47+1}-\frac{1}{5\cdot23\cdot(16\cdot47-1)-\frac{3}{17}}}$$

$$=1/137.035999037435$$

${}^{46,47,48,49,50}_{22}Ti_{24,25,26,27,28}$ ${}^{50,51}_{23}V_{27,28}$ ${}^{107,109}_{47}Ag_{60,62}$ ${}^{5\cdot47,14\cdot17}_{92}U^{*}_{143,146}$ ${}^{2\cdot157}_{126}Ch^{ie}_{4\cdot47}$

$$\alpha_2 = \frac{25\cdot(2\pi)_{NC-9}}{2\cdot9\cdot13}\frac{1}{92-\frac{1}{2\cdot157}+\frac{1}{2\cdot7\cdot17\cdot19\cdot29-\frac{7}{22}}}=1/137.035999111818$$

${}^{89}_{39}Y_{50}$ ${}^{114,116,115,117,118,119}_{50}Sn_{64,65,66,67,68,69}$ ${}^{195}_{78}Pt_{117}$ ${}^{5\cdot47,14\cdot17}_{92}U^{*}_{11\cdot13,146}$ ${}^{257}_{100}Fm^{*}_{157}$ ${}^{2\cdot157}_{126}Ch^{ie}_{4\cdot47}$

The above formulas relate to ${}^{235,238}_{92}U^{*}_{143,146}$ and collaborate to predict ${}^{314}_{126}Ch^{ie}_{188}$

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Appendix I: Research History

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3	3-5	2021/6/1-3	
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5	7	2021/6/26	
Preparing this paper	1-8	2021/6/1-26	Shanghai

Note: Date was recorded according to Beijing Time.