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18. Within the atom economical electronic "s, p, d, f Type electron hull shell" forming principle and spin Elliptical orbit parameters variation analysis

18.1. Within the atom economical electronic "s, p, d, f Type electron cloud shell" forming principle and spin Elliptical orbit parameters change

In chapter 16 we have about three of hydrogen, lithium, helium atoms "s type ball shell electron cloud" describes forming principle and calculation. Therefore: each electronic in nucleus and other electronic electric, magnetic field force, not only along the spin elliptical orbits around the nucleus, there are different degrees of lateral additional movement, as shown in figure 18.2, 18.4, 18.6... As shown. It formed the spin elliptical orbit revolving curved surface. When same layer n of rotating ellipsoid surface "electron hull shell" under the action of electric field repelling force symmetry respectively to different space position and direction, were composed "s, p, d, f type electron hull shell". From (1.2-1) type, electronic wave radius:

$R_a \approx h/2\pi m_{eo}c \approx 3.8613\times10^{-13}$m， Diameter $D_a=2R_a\approx7.7232\times10^{-13}$m。

If electron spin elliptical orbit other parameters constant, D_a means "s, p, d, f type electron cloud shell" spin elliptical orbit rotating curved surface of the average "thickness".

When atoms surface has 2 to or above 2 to electronic, each individual within the electronic electronic along their rotating elliptical orbit is symmetrical, synchronous. To electronic spin in elliptical orbit of space position may be asymmetrical or asynchronous, or atomic radius will be as the outer electrons of the spin elliptical orbit from near nuclear point $R_{\theta(0)}$ and far nuclear point $R_{\theta(\pi)}$ a periodic changes greatly. We take the average of the electron spin elliptical orbit radius of $\overline{R}_{\theta i}$ and average intensity of charge coefficient $\overline{Z}_i$ as a calculation basis. Along with the increase in economical electronic logarithm, mutual repelling force between the electric field increases. If each of the respective rotating elliptical orbit with asynchronous movement, will make each pair of electron spin elliptical orbit parameters change with the location of the movement was significantly different. In order to simplify the calculation and analysis, when there is even a surface n atoms to electronic, we shillings n - 1 on the average radius of $\overline{R}_{\theta i}$ in spin elliptical orbit position, the corresponding charge intensity coefficient for $\overline{Z}_i$, due to the symmetry, electron respective elliptical orbit parameters are the same, as long as the calculation of the remaining pair of electron spin elliptical orbit parameters can change. Similarly, when atoms surface electrons with odd, we shillings n on the average radius of $\overline{R}_{\theta i}$ in spin elliptical orbit position, as long as the calculation alone the electron spin elliptical orbit parameters can change.

18.2 atomic surface $N_e = 3$ electronic "s + p type electron Cloud shell" forming principle and spin elliptical orbit Parameters change

When atoms surface for 3 electronic, each electron spin elliptical orbit radius position should be as shown in figure 18.1.

Considering the inner electronic electric repelling force foreign layer, the influence of paired electrons will eliminate a single electronic electronic electric field in the paired repelling force migration, see figure 16.3, the offset Angle Φ_1 can be neglected. So, make pairs electron spin axis rotation surface elliptical orbit to the Z axis. Because paired electrons with symmetry electric repelling force, affect the electronic of alone, its strength far outweigh the magnetic force between each other, so that it cannot form the spin elliptical orbit rotating ellipsoid surface, and can only form the spin elliptical orbit plane. We have:

$$\begin{cases} \dfrac{\overline{Z}_1 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} = \dfrac{2.75e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} - \dfrac{e^2 \overline{R}_{\theta 1}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.1-1) \\ \dfrac{\overline{Z}_2 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} = \dfrac{3e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} - \dfrac{2e^2 \overline{R}_{\theta 2}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.1-2) \end{cases}$$

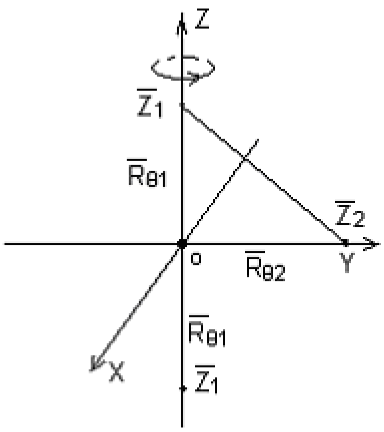


Figure 18.1 atomic surface 3 electrons Spin elliptical orbit average radius Each other location

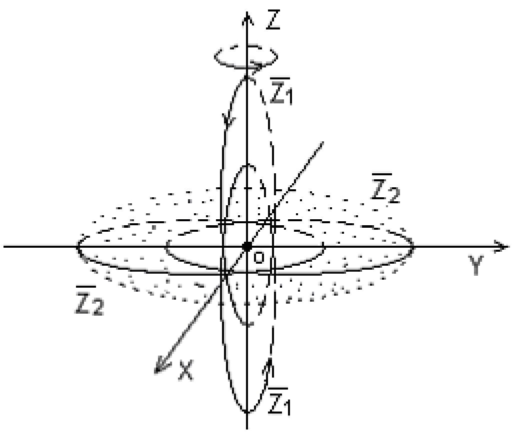


Figure 18.2 atomic surface layer 3 electronic "s + p type electron cloud" forming principle diagram

Simplified to:

$$\begin{cases} \overline{Z}_1 = 2.75 - \left[1 + \left(\dfrac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^2\right]^{-1.5} & (18.2-1) \\ \overline{Z}_2 = 3 - 2\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\right)^2\right]^{-1.5} & (18.2-2) \end{cases}$$

Make $N_{1,1}$, $\overline{R}_{\theta 2}$ the value is changeless, by (15.41), simultaneous equations (18.2) to:

$$\left(\frac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^3 = \frac{3-2\left[1+\left(\frac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\right)^2\right]^{-1.5}}{2.75-\left[1+\left(\frac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^2\right]^{-1.5}} \qquad (18.3)$$

By (15.7), electron spin elliptical orbit of short axis $R_{\theta b}$ for:

$$R_{\theta b} = \frac{r_0 N_{\theta i}^2}{\overline{Z}_i \sqrt{1-E_{\theta i}^2}} \qquad (18.4)$$

By (15.12), electron spin axis elliptical orbit for $\overline{R}_{\theta i}$, its ratio and eccentricity $E_{\theta i}$ the relationship between for:

$$E_{\theta 2} = \sqrt{1-\frac{\overline{Z}_1 \overline{R}_{\theta 1} N_{\theta 2}^2 (1-E_{\theta 1}^2)}{\overline{Z}_2 \overline{R}_{\theta 2} N_{\theta 1}^2}} \qquad (18.5)$$

Assume inner electronic outer electron spin elliptical orbit parameters affect regardless, by (15.11), outer layer of the electronic total ionization energy is:

$$\sum \Delta W_{eia} = \frac{m_{e0}}{2e}\left(\frac{a_c c}{N_{\theta i}}\right)^2 \left[N_{e1}\overline{Z}_1^2(1-E_{\theta 1}^2) + N_{e2}\overline{Z}_2^2(1-E_{\theta 2}^2)\right] \qquad (18.6)$$

By the law of conservation of energy and (18.6), electron spin in elliptical orbit a feature point of eccentricity $E_{\theta 2(\theta)}$ is:

$$E_{\theta 2(\theta)} = \sqrt{1-\frac{\frac{2\sum \Delta W_{eia} N_{\theta i}^2 e}{m_{e0}(a_c c)^2} - N_{e1}\overline{Z}_1^2(1-E_{\theta 1}^2)}{N_{e2} Z_{2(\theta)}^2}} \qquad (18.7)$$

In boron atom, for example, the surface 3 electronic total ionization energy $\sum \Delta W_{ei0}$ =71.382ev, electron spin elliptical orbit each average parameters of the simulation program are as follows:

1. By (18.3), work $\overline{R}_{\theta 2} / \overline{R}_{\theta 1}$ out = 0.988075244.

2. Will $\overline{R}_{\theta 2} / \overline{R}_{\theta 1}$ value respectively into (18.2-1), (18.2-2), to: $\overline{Z}_1$ = 2.390065808,

$\overline{Z}_2$ = 2.305578505.

3. Make N $N_{\theta 1}$=$N_{\theta 2}$=1.5，$E_{\theta 1}$=0.5, along with $\overline{Z}_1$， $\overline{Z}_2$， $\overline{R}_{\theta 2} / \overline{R}_{\theta 1}$, and into (18.5), to: $E_{\theta 2}$== 0.4616635773.

4. Make N_{e1} = 2, N_{e2} = 1, wills the above values into (18.6), to:

$\sum \Delta W_{ei0}$ = 77.1071982 ev.

Atomic surface N_e = 3 when each electron spin elliptical orbit parameters calculation results table table 18.1

Parameters	unit	electronic synchronous movement	electronic asynchronous movement	
		$\theta_1=\overline{\theta}_1$ $\theta_2=\overline{\theta}_2$	$\theta_1=\overline{\theta}_1$ $\theta_2=0$	$\theta_1=\overline{\theta}_1$ $\theta_2=\pi$
$\overline{Z}_1$		2.390065808	1.873906429	2.673715103
$\overline{Z}_2$		2.305578505		
$Z_{2(0)}$			2.950950744	
$Z_{2(\pi)}$				1.51456401
$E_{\theta 1}$		0.552890034	0.552890034	0.552890034
$E_{\theta 2}$		0.5211122705		
$E_{\theta 2(0)}$			0.4520793475	
$E_{\theta 2(\pi)}$				0.4259882855
$\overline{R}_{\theta 1}$	A°	0.7174948319	0.9151256643	0.6413771846
$R_{\theta 1(0)}$	A°	0.3207990899		
$R_{\theta 1(\pi)}$	A°	1.114190574		
$R_{\theta 1b}$	A°	0.597855603	0.7625323299	0.5344302515
$\overline{R}_{\theta 2}$	A°	0.7089388815		
$R_{\theta 2(0)}$	A°	0.3395021313	0.2778634222	
$R_{\theta 2(\pi)}$	A°	1.078375632		1.369541829
$R_{\theta 2b}$	A°	0.6050709258		

5. Adjust $E_{\theta 1}$ value, repeat 3 ~ 4 calculation procedure, finally have to: When $E_{\theta 1}$= 0.552890034, $\sum \Delta W_{ei0}$ = 71.382 ev.

6. Respectively to θ_i =0, π, by (15.12), (15.7), (18.4), the above parameters and, for each electron spin elliptical orbit parameters shown in table 18.1.

Electron spin elliptical orbit parameters simulation procedure is as follows:

7. Shillings in table 18.1, $\overline{R}_{\theta 1}$,$E_{\theta 1}$ is the same, take $R_{\theta 2(0)}/\overline{R}_{\theta 1}$ value respectively into (18.2-1), (18.2-2), to $\overline{Z}_1$、$\overline{Z}_{2(0)}$ values.

8. Will $E_{\theta 1}$,$Z_{2(0)}$, $\overline{Z}_1$ and $\sum \Delta W_{ei0}$ values generation into (18.7), have to $E_{\theta 2(0)}$.

9. Will $\overline{Z}_1$、$Z_{2(0)}$ 、$E_{\theta 1}$、$E_{\theta 2(0)}$ values generation into (15.12), (15.7), respectively, $R_{\theta 2(0)}/\overline{R}_{\theta 1}$ value been evaluated again.

10. With new $R_{\theta 2(0)}/\overline{R}_{\theta 1}$ value respectively into (18.2-1), (18.2-2), 7 ~ 9 repeated calculation procedure, until the $R_{\theta 2(0)}/\overline{R}_{\theta 1}$ is constant.

11. Will be in 10 program, $\overline{Z}_1$, $Z_{2(0)}$, $E_{\theta 1}$, $E_{\theta 2(0)}$ values generation into (15.12), (15.7), respectively, is each electron spin elliptical orbit parameters change results shown in table 18.1.

12. Make: in table 18.1, $\overline{R}_{\theta 1}$, $E_{\theta 1}$ is the same, take $\overline{R}_{\theta 2(\pi)} / \overline{R}_{\theta 1}$ respectively into (18.2-1), (18.2-2) type, repeat 7 ~ 11 calculation procedure, when to $\theta_2 = \pi$, each electron spin elliptical orbit parameters, see table 18.1.

By the results in table 18.1, we draw boron atom surface "s + p" type electron cloud "figure 18.2, dashed part said range. Because the economical paired electron spin elliptical orbit radius and single electronic close, by paired electrons to the symmetry of a single electronic electric repelling force far outweigh the magnetic field strength, thus limits the lateral additional movements of individual electrons, cannot form rotating ellipsoid surface, the spin of electrons will be a single elliptical orbit plane limit in XOY plane within a certain range. This and the lining of the lithium, beryllium atom electronic spin elliptical orbit radius is far less than that of outer electron spin elliptical orbit radius has essential difference.

18.3 atomic surface N_e = 4 electronic "s + p type electron Cloud shell" forming principle and spin elliptical orbit Parameters change

When atoms surface for four electronic, composed of two pairs of spin elliptical orbit rotating curved surface, long axis orthogonal. To long axis Z and Y, respectively, as shown in figure 18.3 and figure 18.4, we have:

$$\begin{cases} \dfrac{\overline{Z}_1 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} = \dfrac{3.75 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} - \dfrac{2e^2 \overline{R}_{\theta 1}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.8-1) \\ \dfrac{\overline{Z}_2 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} = \dfrac{3.75 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} - \dfrac{2e^2 \overline{R}_{\theta 2}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.8-2) \end{cases}$$

Simplified to:

$$\begin{cases} \overline{Z}_1 = 3.75 - 2\left[1 + \left(\overline{R}_{\theta 2} / \overline{R}_{\theta 1}\right)^2\right]^{-1.5} & (18.9-1) \\ \overline{Z}_2 = 3.75 - 2\left[1 + \left(\overline{R}_{\theta 1} / \overline{R}_{\theta 2}\right)^2\right]^{-1.5} & (18.9-2) \end{cases}$$

Make to $N_{1,1} = 1$, by (15.41), simultaneous equations (18.9) ,we have:

$$\left(\frac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^3 = \frac{3.75 - 1/\sqrt{2}}{3.75 - 1/\sqrt{2}} = 1 \qquad (18.10)$$

In the case of carbon atoms, outer 4 electronic total ionization energy $\sum \Delta W_{ei0}$ = 148.022 ev. By equations (18.9) and (18.4) ~ (18.7) and (18.10), refer to section 18.2, 1 ~ 12 calculation procedure, obtained carbon atoms outer 4 electron spin elliptical orbit parameters shown in table 18.2. In table 18.2 related parameters, draw "s + p type electron cloud" is shown in figure 18.4.

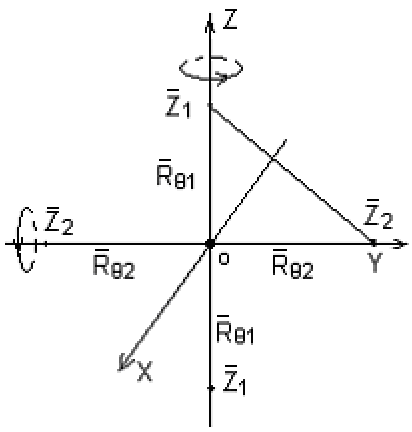


Figure 18.3 atomic surface four electron spin elliptical orbit average radius each other locations

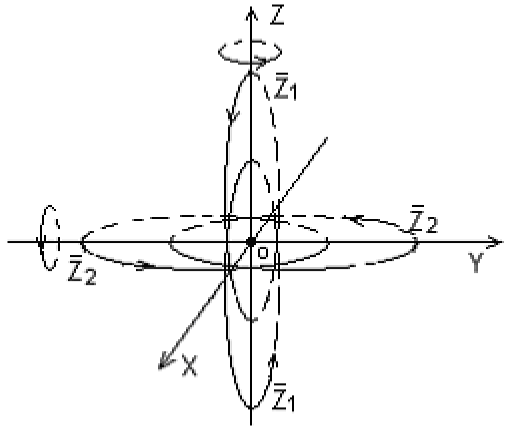


Figure 18.4 atomic surface four electronic "s + p type electron cloud" forming principle diagram

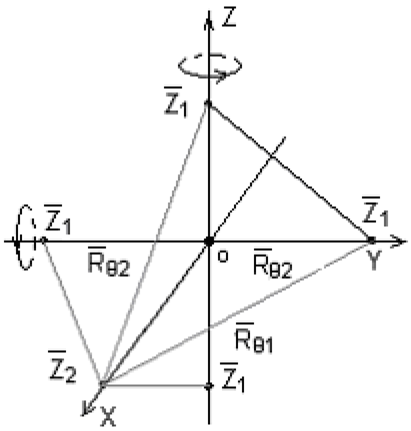
Atomic surface $N_e = 4$ of each electron spin elliptical orbit parameters calculation results table table 18.2

Parameters	unit	electronic synchronous movement	electronic asynchronous movement	
		$\theta_1=\bar{\theta}_1$ $\theta_2=\bar{\theta}_2$	$\theta_1=\bar{\theta}_1$ $\theta_2=0$	$\theta_1=\bar{\theta}_1$ $\theta_2=\pi$
$\bar{Z}_1$ $\bar{Z}_2$ $Z_{2(0)}$ $Z_{2(\pi)}$		3.042893219 3.042893219	1.883344748 3.730935226	3.615823698 2.224273457
$E_{\theta 1}$ $E_{\theta 2}$ $E_{\theta 2(0)}$ $E_{\theta 2(\pi)}$		0.5822983728 0.5822983728	0.5822983728 0.5377207746	0.5822983728 0.5222067743
$\bar{R}_{\theta 1}$ $R_{\theta 1(0)}$ $R_{\theta 1(\pi)}$ $R_{\theta 1b}$	A°	0.592028247 0.2472911621 0.9367653318 0.4813042567	0.9565315859 0.7776364157	0.4982208449 0.4050411694
$\bar{R}_{\theta 2}$ $R_{\theta 2(0)}$ $R_{\theta 2(\pi)}$ $R_{\theta 2b}$		0.592028247 0.2472911621 0.9367653318 0.4813042567	 0.2075336376	 1.120354653

18.4 atomic surface Ne = 5 electronic "s + p type electron Cloud shell" forming principle and spin elliptical orbit Parameters change

When electronic surface for 5 electronic, be omitting alone electronic electrostatic field, the repelling force in pairs cyberspace translation effect. Make two of electronic spin elliptical orbit of rotation axis of the curved surface of orthogonal, Z and Y, respectively. The spin of electrons alone elliptical orbit plane in two symmetry of electronic electric field under the common function of repelling force can only on the symmetry plane $Z^2 = Y^2$, see figure 18.5 and figure 18.6. We have:

$$\begin{cases} \dfrac{\overline{Z}_1 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} = \dfrac{4.75e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} - \dfrac{2e^2 \overline{R}_{\theta 1}}{4\pi\varepsilon_0 (2\overline{R}_{\theta 1}^2)^{1.5}} - \dfrac{e^2 \overline{R}_{\theta 1}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.11-1) \\ \dfrac{\overline{Z}_2 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} = \dfrac{5e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} - \dfrac{4e^2 \overline{R}_{\theta 2}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.11-2) \end{cases}$$



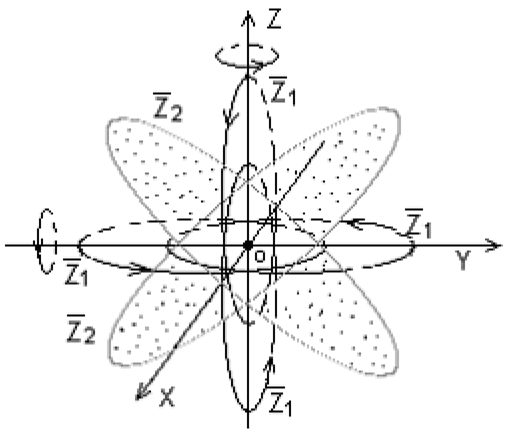


Figure 18.5 atoms in the surface 5 average radius electron spin elliptical orbit each other locations

Figure 18.6 atoms in the surface 5 electronic "s + p type electron cloud" forming principle diagram

Simplified to:

$$\begin{cases} \overline{Z}_1 = 4.75 - \dfrac{1}{\sqrt{2}} - \left[1 + \left(\dfrac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^2\right]^{-1.5} & (18.12-1) \\ \overline{Z}_2 = 5 - 4\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\right)^2\right]^{-1.5} & (18.12-2) \end{cases}$$

By (15.41), to $N_{1,1} = 1$, and $R_{\theta 2} = \overline{R}_{\theta 2}$,to simultaneous (18.12-1), (18.12-2), to:

$$\left(\frac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^3 = \frac{5 - 4\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\right)^2\right]^{-1.5}}{4.75 - \dfrac{1}{\sqrt{2}} - \left[1 + \left(\dfrac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^2\right]^{-1.5}} \qquad (18.13)$$

Atomic surface $N_e = 5$ of each electron spin elliptical orbit parameters calculation results table table 18.3

Parameters	unit	electronic synchronous movement	electronic asynchronous movement

		$\theta_1=\overline{\theta}_1$ $\theta_2=\overline{\theta}_2$	$\theta_1=\overline{\theta}_1$ $\theta_2=0$	$\theta_1=\overline{\theta}_1$ $\theta_2=\pi$
$\overline{Z}_1$ $\overline{Z}_2$ $Z_{2(0)}$ $Z_{2(\pi)}$		3.685287886 3.601932526	3.149186373 4.922430344	3.997903958 1.73443558
$E_{\theta1}$ $E_{\theta2}$ $E_{\theta2(0)}$ $E_{\theta2(\pi)}$		0.5898687787 0.572493059	0.5898687787 0.4956293072	0.5898687787 0.4280450466
$\overline{R}_{\theta1}$ $R_{\theta1(0)}$ $R_{\theta1(\pi)}$ $R_{\theta1b}$	A°	0.4954823145 0.2032127668 0.7877518623 0.4001015314	0.5798307102 0.4682127865	0.4567380783 0.3688155949
$\overline{R}_{\theta2}$ $R_{\theta2(0)}$ $R_{\theta2(\pi)}$ $R_{\theta2b}$		0.4917181158 0.2102129075 0.7732233241 0.4031643872	0.0161726111	1.200227822

With nitrogen atoms as an example, the surface layer 5 electronic total ionization energy $\sum \Delta W_{ei0}$ =266.943ev. By (18.12-1), (18.12-2), (18.13) and (18.4) ~ (18.7), refer to section 18.2 1 ~ 12 calculation program, obtain nitrogen atoms outer five electron spin elliptical orbit parameters shown in table 18.3. In table 18.3 related parameters, draw "s + p type electron cloud" is shown in figure 18.6.

18.5 atomic surface N_e = 6 electronic "p-type electron hull shell -" Shell forming principle and spin elliptical orbit parameters change

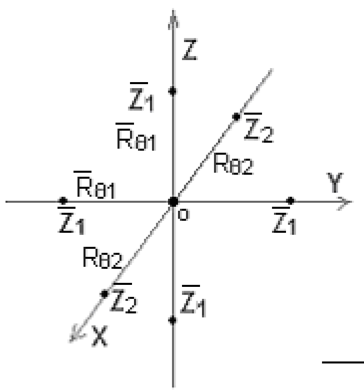


Figure 18.7 atoms in the surface 6 average Radius electron spins elliptical orbit each other locations

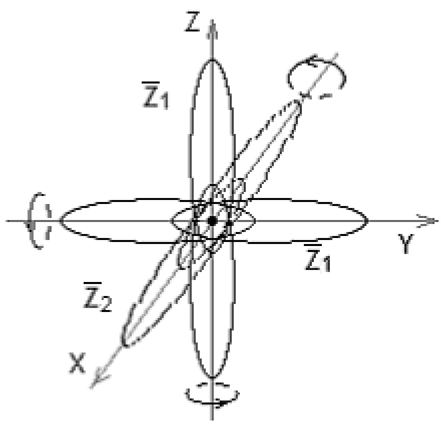


Figure 18.6 atoms in the surface 6 electronic " p type electron cloud" forming principle diagram

When atoms surface has six electrons, can be composed of 3 to spin elliptical orbit rotating curved surface, long axis X, Y, and Z axis, respectively, see figure 18.7 and figure 18. 8, make to $R_{\theta 2} = \overline{R}_{\theta 2}$, we have:

$$\begin{cases} \dfrac{\overline{Z}_1 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} = \dfrac{5.75e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} - \dfrac{2e^2 \overline{R}_{\theta 1}}{4\pi\varepsilon_0 (2\overline{R}_{\theta 1}^2)^{1.5}} - \dfrac{2e^2 \overline{R}_{\theta 1}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.14-1) \\ \dfrac{\overline{Z}_2 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} = \dfrac{5.75e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} - \dfrac{4e^2 \overline{R}_{\theta 2}}{4\pi\varepsilon_0 (\overline{R}_{\theta 1}^2 + \overline{R}_{\theta 2}^2)^{1.5}} & (18.14-2) \end{cases}$$

Simplified to:

$$\begin{cases} \overline{Z}_1 = 5.75 - \dfrac{1}{\sqrt{2}} - 2\left[1 + \left(\overline{R}_{\theta 2} / \overline{R}_{\theta 1}\right)^2\right]^{-1.5} & (18.15-1) \\ \overline{Z}_2 = 5.75 - 4\left[1 + \left(\overline{R}_{\theta 1} / \overline{R}_{\theta 2}\right)^2\right]^{-1.5} & (18.15-2) \end{cases}$$

By (15.41), make to $N_{1,1} = 1$, simultaneous (18.15-1), (18.15-2), to:

$$\left(\frac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^3 = \frac{5.75 - 4\left[1 + \left(\overline{R}_{\theta 1} / \overline{R}_{\theta 2}\right)^2\right]^{-1.5}}{5.75 - 1/\sqrt{2} - 2\left[1 + \left(\overline{R}_{\theta 2} / \overline{R}_{\theta 1}\right)^2\right]^{-1.5}} - 1 \qquad (18.16)$$

Atomic surface $N_e = 6$ of each electron spin elliptical orbit parameters calculation results table table 18.4

Parameters	unit	electronic synchronous movement	electronic asynchronous movement	
		$\theta_1=\overline{\theta}_1$ $\theta_2=\overline{\theta}_2$	$\theta_1=\overline{\theta}_1$ $\theta_2=0$	$\theta_1=\overline{\theta}_1$ $\theta_2=\pi$
$\overline{Z}_1$ $\overline{Z}_2$ $Z_{2(0)}$ $Z_{2(\pi)}$		4.335786438 4.335786438	3.191587114 5.705010024	4.941044071 2.54533553
$E_{\theta 1}$ $E_{\theta 2}$ $E_{\theta 2(0)}$ $E_{\theta 2(\pi)}$		0.604175147 0.604175147	0.604175147 0.5451451743	0.604175147 0.5080773644
$\overline{R}_{\theta 1}$ $R_{\theta 1(0)}$ $R_{\theta 1(\pi)}$ $R_{\theta 1b}$	A°	0.4324749568 0.1711843362 0.6937655774 0.3446183394	0.5875193079 0.4681656708	0.3794985483 0.3024040062
$\overline{R}_{\theta 2}$ $R_{\theta 2(0)}$ $R_{\theta 2(\pi)}$ $R_{\theta 2b}$		0.4324749568 0.1711843362 0.6937655774 0.3446183394	 0.1350697163	 0.9509153166

With oxygen, for example, the surface six electronic total ionization energy of $\sum \Delta W_{ei0}$ = 433.092ev. By (18.16), (18.15-1), (18.15-2), (18.4) ~ (18.7), refer to section 18.2 1 ~ 12 calculation procedure, for oxygen outer six electron spin elliptical orbit parameters shown in table 18.4. With the related parameters in the table 18.4, draw "p type electron cloud" see figure 18. 8.

18.6. Atomic surface N_e = 7, 8 of the electronic type

"p + d shell electron hull" forming principle and electron Spin elliptical orbit parameters change

When atoms surface for seven electrons, to simplify the calculation, we should add an electronic, composed of 4 to spin elliptical orbit rotating curved surface, long axis center for cube and vertex of the attachment, as shown in figure 18.9, the nucleus is located in the center of a cube. A cube side for 2 d, the $\overline{R}_{\theta 1} = \sqrt{3}d$, in the DOB and DOC triangle:

Make to $\beta_1 = 2\arcsin\left(1/\sqrt{3}\right), \beta_2 = 2\arcsin\sqrt{2/3}$. In AOB,AOC arbitrary triangle:

$$\begin{cases} L_1^2 = \overline{R}_{\theta 1}^2 + R_{\theta 2}^2 - 2\overline{R}_{\theta 1} R_{\theta 2} \cos\beta_1 & (18.17\text{-}1) \\ L_2^2 = \overline{R}_{\theta 1}^2 + R_{\theta 2}^2 - 2\overline{R}_{\theta 1} R_{\theta 2} \cos\beta_2 & (18.17\text{-}2) \end{cases}$$

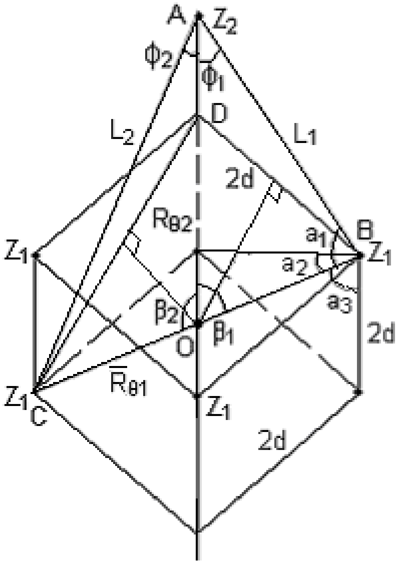


Figure 18.9 7 electron spin orbit radius relative location plan

$$\begin{cases} \cos\phi_1 = \dfrac{R_{\theta 2}^2 + L_1^2 - \overline{R}_{\theta 1}^2}{2R_{\theta 2} L_1} & (18.18-1) \\ \cos\phi_2 = \dfrac{R_{\theta 2}^2 + L_2^2 - \overline{R}_{\theta 1}^2}{2R_{\theta 2} L_2} & (18.18-2) \end{cases}$$

The equations (18.17) into (18.18) the equation:

$$\begin{cases} \cos\phi_1 = \dfrac{R_{\theta 2} - \overline{R}_{\theta 1}\cos\beta_1}{L_1} & (18.19-1) \\ \cos\phi_2 = \dfrac{R_{\theta 2} - \overline{R}_{\theta 1}\cos\beta_2}{L_2} & (18.19-2) \end{cases}$$

By the same token：

$$\begin{cases}\cos\alpha_1 = \dfrac{\overline{R}_{\theta 1} - R_{\theta 2}\cos\beta_1}{L_1} & (18.20\text{-}1)\\ \cos\alpha_2 = \sqrt{2/3} & (18.20\text{-}2)\\ \cos\alpha_3 = \dfrac{1}{\sqrt{3}} & (18.20\text{-}3)\end{cases}$$

By figure 18.9 to:

$$\begin{cases}\dfrac{\overline{Z}_1 e^2}{4\pi\varepsilon_0 R_{\theta 1}^2} = \dfrac{6.75e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} - \dfrac{e^2\cos a_1}{4\pi\varepsilon_0 L_1^2} - \dfrac{2e^2\cos a_2}{4\pi\varepsilon_0 (2\sqrt{2}d)^2} - \dfrac{2e^2\cos a_3}{4\pi\varepsilon_0 (2d)^2} & (18.21-1)\\ \dfrac{\overline{Z}_2 e^2}{4\pi\varepsilon_0 R_{\theta 2}^2} = \dfrac{7e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 2}^2} - \dfrac{3e^2\cos\phi_1}{4\pi\varepsilon_0 L_1^2} - \dfrac{3e^2\cos\phi_2}{4\pi\varepsilon_0 L_2^2} & (18.21-2)\end{cases}$$

The equations (18.17), (18.19), (18.20) into (18.21) equations are simplified to:

$$\begin{cases}\overline{Z}_1 = 6.75 - \dfrac{1 - \dfrac{R_{\theta 2}}{\overline{R}_{\theta 1}}\cos\beta_1}{\left[1 + \left(\dfrac{R_{\theta 2}}{\overline{R}_{\theta 1}}\right)^2 - 2\dfrac{R_{\theta 2}}{\overline{R}_{\theta 1}}\cos\beta_1\right]^{1.5}} - \dfrac{\sqrt{6}}{4} - \dfrac{\sqrt{3}}{2} & (18.22-1)\\ \overline{Z}_2 = 7 - \dfrac{3\left(1 - \dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_1\right)}{\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^2 - 2\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_1\right]^{1.5}} - \dfrac{3\left(1 - \dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_2\right)}{\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^2 - 2\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_2\right]^{1.5}} & \end{cases}$$

（18.22-2）

Make to $N_{1,1} = 1$, $R_{\theta 2} = \overline{R}_{\theta 2}$ and will (15.41) and (18.22) equations united stand:

$$\left(\frac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^3 = \frac{7 - \dfrac{3\left(1 - \dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\cos\beta_1\right)}{\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\right)^2 - 2\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\cos\beta_1\right]^{1.5}} - \dfrac{3\left(1 - \dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\cos\beta_2\right)}{\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\right)^2 - 2\dfrac{\overline{R}_{\theta 1}}{\overline{R}_{\theta 2}}\cos\beta_2\right]^{1.5}}}{6.75 - \dfrac{1 - \dfrac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\cos\beta_1}{\left[1 + \left(\dfrac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\right)^2 - 2\dfrac{\overline{R}_{\theta 2}}{\overline{R}_{\theta 1}}\cos\beta_1\right]^{1.5}} - \dfrac{\sqrt{6}}{4} - \dfrac{\sqrt{3}}{2}}$$

（18.23）

In fluorine atoms, for example, the surface 7 electronic total ionization energy $\sum \Delta W_{ei0}$ = 658.820ev. Internal electron spin elliptical orbit parameters simulation procedure is as follows:

1. The solution of (18.23), to: $\overline{R}_{\theta 2}/\overline{R}_{\theta 1}$ = 0.997055596.

2. Will $\overline{R}_{\theta 2}/\overline{R}_{\theta 1}$ value generation to equations (18.22) are: $\overline{Z}_1$= 4.836033903, $\overline{Z}_2$ =4.793441857.

3. Make $E_{\theta 1}$=0.8, will $\overline{R}_{\theta 2}/\overline{R}_{\theta 1}$, $\overline{Z}_1$ and $\overline{Z}_2$ values generation into (18.5), to: $E_{\theta 2}$= 0.797325946.

4. Make $N_{\theta 1}$ =$N_{\theta 2}$=1、N_{e1}=6、N_{e2}=1, , along with $\overline{Z}_1$, $\overline{Z}_2$, $E_{\theta 1}$, $E_{\theta 2}$ together into (18.6), is: $\sum \Delta W_{ei0}$ = 801.1891634ev.

5. Adjust $E_{\theta 1}$ scope, repeat 3 ~ 4 calculation procedures, the last to: when the $E_{\theta 1}$= 0.8390298168, $\sum \Delta W_{ei0}$ =658.820ev.

6. To 5 the $\overline{Z}_1$、$\overline{Z}_2$、$E_{\theta 1}$、$E_{\theta 2}$ values calculation program, make θ_i =0, π, respectively into (15.7), (15.12), (18.4), electron spin elliptical orbit parameters is shown in table 18.5.

When atoms surface have 8 electrons, for symmetric synchronous movement of the spin, can form 4 to spin elliptical orbit rotating ellipsoid surface. Long axis as the cube of center of diagonal, 8 electronic just 8 symmetrical distributions of the cube vertices, see figure 18.10. If the cube of the distance of 2d, is $\overline{R}_{\theta 1} = \sqrt{3}d$ then, in the right triangle estates AOC and AOB: $\cos\alpha_1 = 1/\sqrt{3}$ 、 $\cos\alpha_2 = \sqrt{2/3}$.

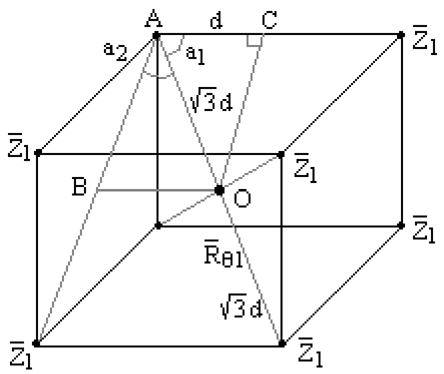


Figure 18.10 8 electron spin orbit mean radius relative location plan

By Coulomb's law, we have:

$$\frac{\overline{Z}_1 e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} = \frac{7.75e^2}{4\pi\varepsilon_0 \overline{R}_{\theta 1}^2} - \frac{3e^2\cos\alpha_1}{4\pi\varepsilon_0 (2d)^2} - \frac{3e^2\cos\alpha_2}{4\pi\varepsilon_0 \left(2\sqrt{2}d\right)^2} \qquad (18.24)$$

Solution (18.24) to:

$$\overline{Z}_1 = 7.75 - \frac{3\sqrt{3}}{4} - \frac{3\sqrt{6}}{8} = 5.532403241$$

With neon atoms as an example, surface 8 electronic total ionization energy $\sum \Delta W_{ei0}$ = 953.586ev. Make $N_{\theta 1}$ = 1, from (15.11) type, to: $E_{\theta 1}$ = 0.8448466598.

Atomic surface N_e = 7, 8 electronic spin elliptic orbit parameters table table 18.5

N_{ei}	$\overline{Z}_1$	$E_{\theta i}$	Length unit A°			
			$\overline{R}_{\theta i}$	$R_{\theta i(0)}$	$R_{\theta i(\pi)}$	$R_{\theta ib}$
7	4.836033903 4.793441857	0.839029817 0.836934109	0.3696389 0.3685505	0.0595008 0.0600980	0.6797769 0.6770030	0.2011151 0.2017090
8	5.532403241	0.844846660	0.3341688	0.0518474	0.6164903	0.1787832

Make θ_i=0, π, rhapsodize about it, will, $E_{\theta 1}$, $N_{\theta 1}$ value respectively substitution (15.7), (15.12) and (18.4) type; calculate electron spin elliptic orbit parameters change also see table 18.5.

18.7. Atomic surface N_e = 9 ~ 14 electronic "d + f type electron cloud shell" forming principle

18.7.1 Atomic surface Ne = 9, 10 electronic "d + f type electron cloud" forming principle

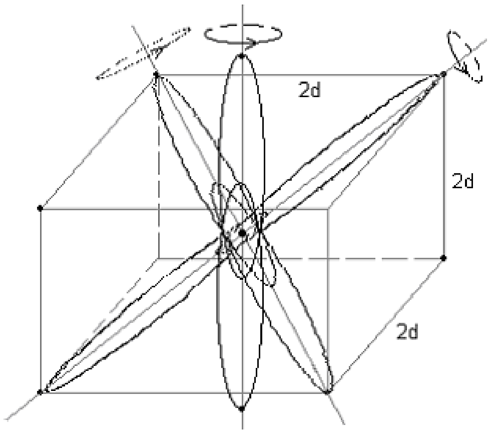


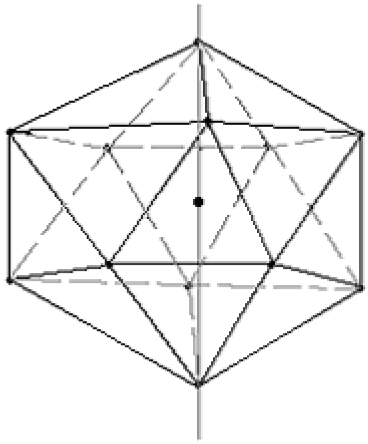
Figure 18.11 N_e = 9, 10 electron spin elliptical orbit radius mutual location plan

The author did not collect nickel system and lanthanide atomic surface and inner 10 ~ 14 electronic total ionization energy material, to be precise calculation the atomic this layer electron spin elliptic orbit parameters according to the lack of. Here only in accordance with this chapter model, the mentality, given "d + f type electron cloud" space distribution characteristics.

When atomic surface for 9, 10 electronic, (9 electronic is empty to add an electron), 5 of the electronic spin elliptic orbit surface of revolution. We can will cube "flattening", four long shaft through the cube center point to eight points, a long shaft and squashed cube vertical, see figure 18.11.

This "d + f type electron cloud" spin elliptic orbit parameters $\overline{Z}_1$ 、$E_{\theta 1}$ 、$\overline{R}_{\theta 1}$ and $\overline{Z}_2$ 、$E_{\theta 2}$ 、$\overline{R}_{\theta 2}$ are tiny difference, for eight electronic only and central shaft, center O is symmetrical, and up and down between two adjacent electronic is not symmetrical. Here, we refer to table 18.5 calculation data, roughly draw three to electron spin elliptic orbit surface of revolution "d + f type electronic clouds".

18.7.2 Atomic surface Ne = 11, 12 electronic "d + f type electronic cloud" forming principle



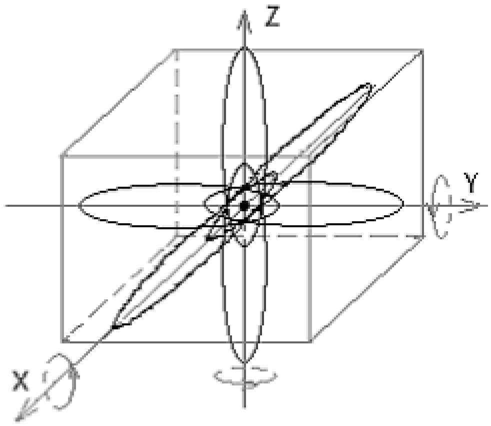


Figure 18.12 N_e=11, 12 electron spin Orbit radius mutual location plan

Figure 18.13 N_e = 13, 14 electronic "f type electron cloud" forming principle diagram

When atomic surface electronic for 11, 12, (11 electronic is empty to add an electron), can form 6 to electron spin elliptic orbit surface of revolution. The ball inscribed polygon to the geometrical characteristics of the known: the ball inscribed is twenty surface body vertexes is just 12, each face is equilateral triangle. Six long shaft just over center symmetrically and 12 vertex connection, then 12 electronic completely symmetrical synchronous spin movement, spin elliptic orbit parameters are completely same, see figure 18.12.

18.7.3 Atomic surface Ne = 13, 14 electronic "d + f type electronic cloud" forming principle

When atomic surface for 13, 14 electronic, (13 electronic is empty to add an electron), composition and the electronic spin elliptic orbit surface of revolution. Three long shaft a cube center vertical cube six surface, respectively (X, Y, Z axis, four long shaft for cube center and eight points of the wires, (see figure 18.10) is shown in figure 18.13.

At this time, eight points of the electron spin elliptic orbit parameters and long axis vertical cube surface six electron spin elliptic orbit parameters slightly different. In figure 18.13 reference table 18.5 parameters draw X, Y, Z axis direction and electron spin elliptic orbit surface of revolution "d + f type electronic clouds".

18.8 internal and outer electronic interactions between shielding effect and parameter calculation

The atomic radius as elements cycle number bigger and increase gradually, outer electronic ionization energy to gradually reduce the phenomenon, academia would have noticed that inner electron foreign layer electronic shielding effect. Here to eight electronic as an example, the calculation in the two states, outer electronic between shielding effect, in order to compare.

18.8.1 Outer electrons and inner a pair of electronic and atomic Nucleus in the same line

Refer to figure 18.9 and (18.21-2), (18.22-2) type, we have:

$$\frac{Z_2 e^2}{4\pi\varepsilon_0 R_{\theta 2}^2} = \frac{9e^2}{4\pi\varepsilon_0 R_{\theta 2}^2} - \frac{e^2}{4\pi\varepsilon_0 (R_{\theta 2} + \overline{R}_{\theta 1})^2} - \frac{e^2}{4\pi\varepsilon_0 (R_{\theta 2} - \overline{R}_{\theta 1})^2}$$

$$-\frac{3e^2 \cos\phi_1}{4\pi\varepsilon_0 L_1^2} - \frac{3e^2 \cos\phi_2}{4\pi\varepsilon_0 L_2^2} \tag{18.25}$$

Simplified to:

$$Z_2 = \left\{ \begin{array}{l} 9 - \left(1 + \dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^{-2} - 3\left(1 - \dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_1\right)\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^2 - 2\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_1\right]^{-1.5} \\ -3\left(1 - \dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_2\right)\left[1 + \left(\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^2 - 2\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\cos\beta_2\right]^{-1.5} - \left(1 - \dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^{-2} \end{array} \right\}$$

(18.26)

Inner and outer electronic between shielding effect results table table 18.6

By (18.26) type							
$\overline{R}_{\theta 1}/R_{\theta 2}$	5	3	2	1.5	1.3	1	0.9
Z_2	8.87790	8.54316	7.43276	3.88195	-3.63169	-∞	-93.8972
$\overline{R}_{\theta 1}/R_{\theta 2}$	0.8	0.7	0.6	0.5	0.2	0.1	0.05
Z_2	-19.385	-6.0308	-1.733996	-0.049736	0.98198	0.99894	0.99994
By (18.29) type							
$\overline{R}_{\theta 1}/R_{\theta 2}$	$3^{1/2}$	1.5	1.25	1.1	1	0.9	0.8
Z_2	8.45567	8.04223	7.20073	6.390549	5.69864	4.89650	4.02452
$\overline{R}_{\theta 1}/R_{\theta 2}$	0.7	0.6	0.5	0.2	0.1	0.05	0.02
Z_2	3.15351	2.37156	1.755686	1.024067	1.001543	1.00010	1.00000

Respectively to $\overline{R}_{\theta 1}/R_{\theta 2}$ = 0.9, 0.8,... 0.001, substituting (18.26) type, can find out Z_2 parameters change, see table 18.6. Please note that Z_2 value in a considerable range is negative, it is not realistic, which can conclude, this plan is not established.

18.8.2 Outer electrons and cube on the surface of the perpendicular line through the center of the nucleus

As shown in figure 18.14 shows, a cube of side length is 2 d, in a right triangle ABC, ADE,

$$\begin{cases} L_1^2 = 2d^2 + (R_{\theta 2} - d)^2 & (18.27-1) \\ L_2^2 = 2d^2 + (R_{\theta 2} + d)^2 & (18.27-2) \\ \cos\phi_1 = \dfrac{R_{\theta 2} - d}{L_1} & (18.27-3) \\ \cos\phi_2 = \dfrac{R_{\theta 2} + d}{L_2} & (18.27-4) \end{cases}$$

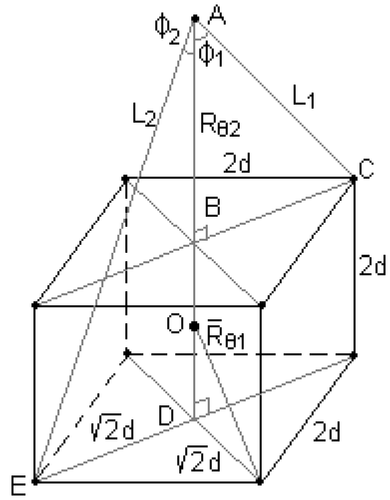


Figure 18.14 inner electron foreign layer electronic shielding effect diagrams

By the Coulomb's law:

$$\frac{Z_2 e^2}{4\pi\varepsilon_0 R_{\theta 2}^2}=\frac{9e^2}{4\pi\varepsilon_0 R_{\theta 2}^2}-\frac{4e^2\cos\phi_1}{4\pi\varepsilon_0 L_1^2}-\frac{4e^2\cos\phi_2}{4\pi\varepsilon_0 L_2^2} \qquad (18.28)$$

Because $\overline{R}_{\theta 1}=\sqrt{3}d$, both $d=\overline{R}_{\theta 1}\big/\sqrt{3}$, (18.27) equations substitution (18.28) type simplified to:

$$Z_2=9-\frac{4\left(1-\dfrac{\overline{R}_{\theta 1}}{\sqrt{3}R_{\theta 2}}\right)}{\left[1+\left(\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^2-\dfrac{2\overline{R}_{\theta 1}}{\sqrt{3}R_{\theta 2}}\right]^{1.5}}-\frac{4\left(1+\dfrac{\overline{R}_{\theta 1}}{\sqrt{3}R_{\theta 2}}\right)}{\left[1+\left(\dfrac{\overline{R}_{\theta 1}}{R_{\theta 2}}\right)^2+\dfrac{2\overline{R}_{\theta 1}}{\sqrt{3}R_{\theta 2}}\right]^{1.5}} \qquad (18.29)$$

Respectively make to $\overline{R}_{\theta 1}/R_{\theta 2}=\sqrt{3}$, 1.5... 1,... 0.02, substituting (18.29) type, get Z_2 value table 18.6.

The electronic electric repulsion force between effects, especially close range, each layer, each electron spin elliptic orbit surface of revolution must try to stagger, in limited atomic space range occupy different space and bearing. So, the second by (18.29) type calculation of inner electronic shielding effect model was established.

18.9 electron spin elliptic orbit and spin like a streamlined body of revolution surface track relationship

Comprehensive front atomic internal electron spin elliptic orbit parameters, level change results comparison, it is easy to see: "s, p, d, f type electron cloud shell are electron atomic nucleus along the spin ellipse, and additional lateral movement of the formation of rotating ellipsoid surface; (N_e = 3, 5 and falls single electron spin elliptic orbit not form a surface of revolution); The only difference lies in the "electron cloud type" from s→p→d→f evolution process in the same electronic number increasing, spin quantum number $N_{\theta i}$=1→1.5→1, eccentricity $E_{\theta I}$ change, ellipsoid surface of revolution spindles just; If in the same electronic along the elliptic orbit rotating ellipsoid surface is symmetrical, synchronous movement, various electronic Angle between are synchronous change; Each electron charge strength factor Z_i, elliptical orbit eccentricity $E_{\theta I}$ also are constant; Track for rules of the rotating ellipsoid surface, outer and time along the outer electron spin elliptic orbit motion cycle multiple relationship between to set up; Each electronic integrated electric field gravity, are made by spin orbit radius to nuclear center, the moment of momentum conservation quantization orbital motion can be established; But atomic radius and surface electron orbit radius will appear periodic changes greatly.

By (15.13) type, the law of conservation of energy, atomic inside a layer electronic ionization energy is constant, the average charge strength coefficient of $\overline{Z}_i$, spin elliptic orbit long shaft $\overline{R}_{\theta i}$ is valued, and eccentricity $E_{\theta i}$ not size. In the same every electronic ionization energy, charge strength factor should be is the nucleus, inner, outer layers and all charge field common result of the integrated effects of. Table 18.6, Z_i change it is easy to see: due to the inner electronic shielding effect, outer electronic Z_i coefficient with spin elliptical orbit radius $R_{\theta I}$ decreases; For nuclear center position, elliptical orbit long shaft, electronic ionization energy are the same, so, by (15.13), it is known that $\overline{R}_{\theta i}$ type directly with Zi is inversely proportional, The elliptic orbit surface of revolution will deformation, in the form of a blunt tip like streamline surface of revolution, laboratory observed "S.P.D.F type electron cloud shell", as electronic along the surface is helix orbital motion appearance characteristics reflect, see figure 18.15.

We will electronic along the elliptic orbit velocity, ve, as along the spiral movement of the total speed vector decomposition. Make: $\vec{v}_e = \vec{v}_\varphi + \vec{v}_\phi$ and $\vec{v}_\varphi \perp \vec{v}_\phi$ by Newtonian mechanics and coulomb's law, (15.1-2) type:

$$\frac{m_{e0} v_{\varphi i}^2}{R_{\theta i} \sin\theta} = \frac{Z_i e^2}{4\pi\varepsilon_0 R_{\theta i}^2} \sin\theta \qquad (18.30)$$

Will (15.6) type of Bohr radius r_0, fine structure constant a_c relation and (15.7) type substitution (18.30) type arrangement must:

$$v_{\varphi i} = \frac{Z_i a_c c}{N_{\theta i}} \sin\theta \sqrt{1 + E_{\theta i}\cos\theta} \qquad (18.31)$$

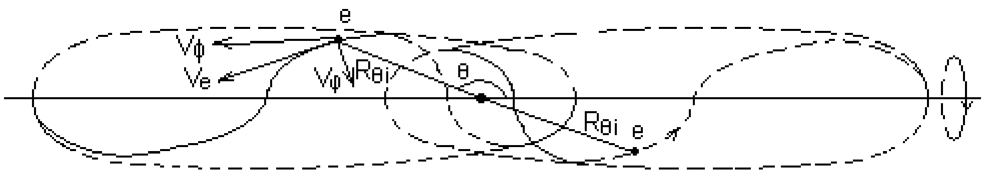


Figure 18.15 electronic along like a streamline revolved spiral movement orbital velocity vector diagram

By (15.8-3) and (18.31) type and figure 18.15 to:

$$v_{\phi i} = \sqrt{v_{ei}^2 - v_{\varphi i}^2} = \frac{Z_i a_c c}{N_{\theta i}} \sqrt{E_{\theta i}\cos\theta(1+\cos^2\theta) + \cos^2\theta + E_{\theta i}^2} \qquad (18.32)$$

Make electronic along the spiral orbit the rotary motion, spin motion cycle respectively is: $T_{\varphi i}$ 、$T_{\phi i}$. By (18.31) and (18.32) type:

$$\begin{cases} T_{\varphi i} = \oint \dfrac{R_{\theta i} \sin\theta}{V_{\varphi i}} d\varphi & (18.33-1) \\ T_{\phi i} = \oint \dfrac{R_{\theta i}}{V_{\phi i}} \sqrt{\dfrac{1+2E_{\theta i}\cos\theta + E_{\theta i}^2}{(1+E_{\theta i}\cos\theta)^2}} d\theta & (18.33-2) \end{cases}$$

The cycle $T_{\phi i}/T_{\varphi i}$ ratio for:

$$\frac{T_{\phi i}}{T_{\varphi i}} = \frac{\oint \dfrac{\sqrt{1+2E_{\theta i}\cos\theta + E_{\theta i}^2}}{(1+E_{\theta i}\cos\theta)^2\sqrt{E_{\theta i}\cos\theta(1+\cos^2\theta)+\cos^2\theta + E_{\theta i}^2}} d\theta}{\oint \dfrac{1}{(1+E_{\theta i}\cos\theta)^{1.5}} d\theta} \qquad (18.34)$$

$T_{\phi i}/T_{\varphi i}$ Ratio and eccentricity $E_{\theta I}$ relationship, the simulation results are as follows:

$E_{\theta i}$	$T_{\phi i}/T_{\varphi i}$
0.9	2.663235
0.5	1.705330
0.2	2.056792
0.1	2.457654
0.01	3.889634

This model is not limited $T_{\phi i}/T_{\varphi i}$ cycle ratio must be simple fraction or natural number. Laboratory actual observation to the so-called "electron cloud" is the electronic movement track cover like streamlined body of revolution of the whole surface. From the front chapters on the atomic outer electronic elliptic orbit eccentricity $E_{\theta I}$ calculation results, stimulate or transition in the process of absorption and emission spectrum of the simulation of the excited state or the level of the elliptic orbit eccentricity $E_{\theta I}$ are shown by (18.34) calculation of $T_{\phi i}/T_{\varphi i}$ value is not a simple fraction or natural number.

We see the material is atomic simple substance or different atoms molecular aggregation. Can this idea: a single atom of the same layer of all the electrons in synchronous spin motion. Atomic, molecular aggregation in the center of each atom, and its adjacent the up and down or so, in all directions of the other atom, surface electronic spin elliptic orbit of asynchronous spin movement, or phase to differ 180 ° with. In this way, namely can have mutual complement maintain fixed volume effect, and can form electric, magnetic field force mutual containment, electronic share of various types of chemical bonds.

If in the same electronic are synchronous movement, the Z_i, $E_{\theta I}$, $N_{1,2}$, $N_{2,3}$,... Contour is very complex variables, each electron spin elliptic orbit surface of revolution will seriously irregular deformation. Each electronic integrated electric field gravity can guarantee always along the spin orbit radius to nuclear center, the moment of momentum conservation quantization movement also difficult to set up; If we consider other layer in an asynchronous spin movement of the electric field repulsive force, magnetic field force interaction, the reader is not difficult to imagine, then each electronic wave, spin, lateral additional movement of the overall track stack movement will be complicated to what extent! Let alone can be solved.