

2, 8, 18, 4

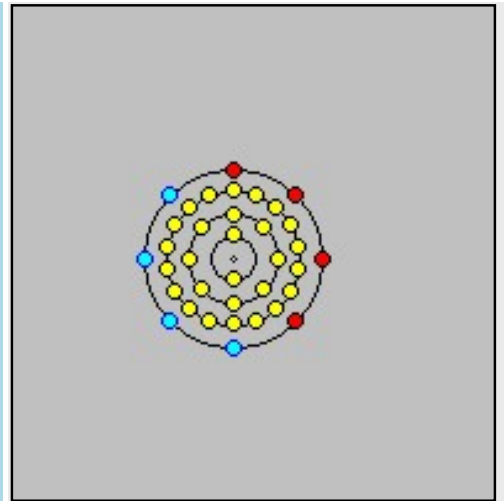
<u>C</u>	<u>Si</u>	<u>Ge</u>	<u>Sn</u>	<u>Pb</u>	<u>Uuq</u>	<u>Uhq</u>	<u>Buq</u>
6	14	32	50	82	114	164	214

## Germanium

Symbol	Ge
Atomic Number	32
Relative Atomic Mass $^{12}\text{C} = 12.0000$	72.64 ( $\pm 1$ ) [Since 1999]
Atomic Radius pm	123
First Ionisation Energy kJ mol <sup>-1</sup>	762.1
Ionisation Energy (eV)	7.8994
Electronegativity	2.01
Density kg m <sup>-3</sup>	5323 [293 K] 5490 [m.p.]
Molar Volume cm <sup>3</sup>	13.64
Thermal Conductivity W m <sup>-1</sup> K <sup>-1</sup>	59.9 [300 K]
Melting Point K	1210.6
Boiling Point K	3103
Number of Isotopes	24
Isotope Atomic mass/u Mole fraction	70Ge 69.924 2500(19) 0.2038(18) 72Ge 71.922 0763(16) 0.2731(26) 73Ge 72.923 4595(16) 0.0776(8) 74Ge 73.921 1784(16) 0.3672(15) 76Ge 75.921 4029(16) 0.0783(7)
Inner + outer Shells	3 + 1 =4
Inner + outer Orbitals	28 + 4 =32
Filling Orbital	4p <sup>2</sup>
Ground State Electron Configuration	[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>2</sup>

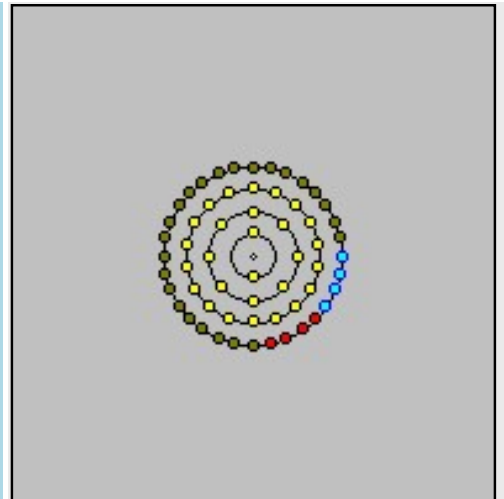
**Ground State Electron Configuration with free Orbitals (n=4)**

0, 0, 0, 4



**Ground State Electron Configuration with compressed Orbitals (n=24)**

0, 0, 0, 24



**Singularity**

$$60 = 28 + 4 + 4 + 24$$

	s	p	d	f	g	h	i	j
1	2							
2	2	6						
3	2	6	10					
4	2	2	4	10	14			
5								
6								
7								

**Term Symbol**

$^3P_0$

**Discovery**

It was discovered and isolated by the German chemist, **Clemens-Alexander Winkler** (Freiberg, Germany) in 1886 in the mineral argyrodite.

**Name Derived From**

Latin Germania meaning 'Germany'