International Journal of Advanced Research in Physical Science (IJARPS)
Volume 7, Issue 6, 2020, PP 1-2
ISSN No. (Online) 2349-7882
www.arcjournals.org

Stable Neon in the Light of Double Surface Concept

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Abstract: *Respecting the double surface concept the partial and overall stability of Neon can be explained by knotting.*

Keywords: *Neon, double surface stability, knotting, individual and overall orbit*

1. INTRODUCTION

The subject of interest of this paper is to examine the stability of Neon in the light of double surface concept.

2. BOHR-LIKE ORBIT

Bohr-like orbit can be attributed to each orbital. Expressing the orbit length in Compton wavelengths of the electron we have[1]:

$$s_{Bohr-like} = \frac{\alpha^{-1}}{Z_{effective}}. \quad (1)$$

Where α^{-1} denotes the inverse fine structure constant and $Z_{effective}$ denotes the effective nuclear charge.

3. THE DOUBLE SURFACE ORBIT

Respecting the double surface concept [1]the length of stable Bohr-like orbit expressed in Compton wavelengths of the electron is the average elliptic-hyperbolic length s determined by the elliptic length $n \in \mathbb{N}$ of that orbit as follows:

$$s_n = n\left(2 - \frac{1}{\sqrt{1+\frac{\pi^2}{n^2}}}\right), n \in \mathbb{N}. \quad (2)$$

The elliptic length n being the natural number is at the same time the name of stable Bohr-like orbit.

4. THE KNOTTED BOHR-LIKE ORBIT

Except Bohr orbit itself (here$Z_{effective} = 1$) Bohr-like orbit is in principle unstable. At the constant energy it can become stable by knotting where the orbit length is multiplied by factor m. For instance, the unstable orbit of Helium atom $s_{He} = 81.206\ 52$ attributed to the effective nuclear charge $z^{He}_{effective} = 1.6875$[1]becomes almost stable (2) in the case being multiplied by factor 5:

$$5\ x\ s_{He} = 406.033 \approx s_{406} = 406.012. \quad (3)$$

To become completelly stable the energy difference should be released as follows:

$$\Delta E = Ry.\alpha^{-1}\left(\frac{1}{5.s_{He}} - \frac{1}{s_{406}}\right) = -2.3\ 10^{-5} eV\ (frequency\ equivalent\ of\ about\ 56\ GHz). \quad (4)$$

Where $Ry = 13.6\ eV$denotes Rydberg constant and $\alpha^{-1} = 137.036$ denotes the inverse fine structure constant.

The above speculations are collected in Table1.

Table1. *The stable knotted Bohr-like orbit of Helium*

Orbital	Effective nuclear charge ($Z_{effective}$)	Orbit length (s) in λ_e	Knott multiple (m)	Knott length (ms) in λ_e	Stable knott length (s_n)	Length difference (Δs) in λ_e	Energy difference (ΔE) in eV	Frequency equivalent (ν)

					in λ_e			
2s	1.6875	81.2065	5★	406.0326	406.0122	0,020	-2.31 10^{-4}	**-55.9GHz**

Figure1. *Five-knotted Bohr-like orbit*

Helium possesses one 5-knotted 2s orbital which is at the same time the overall atom orbital. If knotting process is energy free a 55.9 GHz photon should be emerged in the formation of such knotted orbit.The knotting of Helium is characterised by the multiple five, $m_{He} = 5$.

5. 5 NEON

The stable knotted Bohr-like orbits of Neon are speculated in the present section and results collected in Table2.

Table2. *The stable knotted Bohr-like orbits of Neon*

Orbital	Effective nuclear charge ($Z_{effective}$)	Orbit length (s) in λ_e	Knott multiple (m)	Knott length (ms) in λ_e	Stable knott length(s_n) in λ_e	Length difference (Δs) in λ_e	Energy difference (ΔE) in eV	Frequency equivalent (ν)
1s	9,6421	14,21226	5	71,0613	71,0694	-0,008	2,9910^{-3}	
2s	5,7584	23,79758	5	118,9879	119,0414	-0,054	7,0410^{-3}	
2p	5,7584	23,79758	5	118,9879	119,0414	-0,054	7,0410^{-3}	
2p	5,7584	23,79758	5	118,9879	119,0414	-0,054	7,0410^{-3}	
2p	5,7584	23,79758	5	118,9879	119,0414	-0,054	7,0410^{-3}	
Overall		**109,4026**	**5★**	**547,0130**	**547,0090**	**0,004**	**-2,46 10^{-5}**	**-5.94 GHz**

Neon possesses five 5-knotted orbitals of two types but the overall orbital is energetically favourable. A 5.94 GHz photon should be emerged in the formation of such knotted overall orbit. Contrarily, in the formation of the individual knotted orbits the input of energy is needed.The partial as well as overall knotting of Neon is characterised by the multiple five, $m_{Ne} = 5$.

6. CONCLUSION

With the help of the double surface concept It is evident that the overall stability of Neon can be achieved by respecting the stability of all its constituents.The more we do for home the more the world is spared.

DEDICATION

Urbi et Orbi

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Citation: *Janez Špringer, (2020). Stable Neon in the Light of Double Surface Concept. International Journal of Advanced Research in Physical Science (IJARPS) 7(6), pp. 1-2 2020.*