

## **Proposal of Actual Positions of Hydrogen (H) and Helium (He) in Modern Periodic Table**

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**Abstract:** *The actual positions of H and He in modern periodic table can be determined according to their dual characteristics (electro-positive and electro-negative) and final electronic configuration respectively. It is seen that a new group for H and two sub-groups of 0-group (zero group) for He in periodic table are needed in this respect.*

**Keywords:** *Modern Periodic Law, Chemical Behaviours of H, Electronic Configuration of He, Opinions.*

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### **I. Introduction**

The elements in period-1 of periodic table are two i.e. hydrogen (H) and helium (He). These can be placed in group-IA and group-0(zero group) respectively. But H is placed in both group-IA and group-VIIB because of its dual characteristics with respect to the elements of those groups. For this reason, some scientists cannot place H in either group-IA or group-VIIB; rather they can place it in a specific place in between group-I and group-VII at the above portion of periodic table. On the other hand, final electronic configuration of the elements of group-0 is  $ns^2np^6$ . Thus these elements are p-block elements. But the final electronic configuration of He is  $1s^2$ . So He is perfect as a s-block element; although He is placed in p-block. Clearly there are limitations in case of actual group-placement of H and He in periodic table.

### **II. Sub-Groups of 0-Group**

He can be placed into group-0 of periodic table according to its similar characteristics with other elements of this group. But final electronic configuration of He is not similar with respect to those other elements in that group shown above. However the above two criteria can be explained by considering two sub-groups of group-0. These sub-groups are expressed as 'group-0A'(zero A group) and 'group-0B'(zero B group). Only He is placed in group-0A; whereas the other elements of group-0 i.e. Ne, Ar, Kr, Xe and Rn can be placed in group-0B.

Group-0A be placed in modern periodic table before group-IA. On the other hand group-0B be placed after group-VIIB, where group-0 is already present now.

### **III. Position of Hydrogen (H)**

Now present of group-0A in periodic table can obviously determine the position of H before group-0A with respect to modern periodic law. Thus H must be placed in a specific group before group-0A in periodic table. As a result, H can be situated in a group which is in between the group of strong electro-negative elements(VIIB) and the group of strong electro-positive elements(IA). This arrangement shows that H can bear dual characteristics of group-IA and group-VIIB. The specific group where H is now located be denoted as the group of dual characteristics and named as 'group-O'(optional group).

### **IV. Modified Figures of Groups**

The modified positions of s-block and p-block in modern periodic table can be shown below :

Here all of the groups of modern periodic table can be drawn with its periods(seven periods) serially as group-O, 0A, IA, IIA, IIIA, IVA, VA, VIA, VIIA, VIII, IB, IIB, IIIB, IVB, VB, VIB, VIIB, 0B.

Groups \ Periods	O	0A	IA
1	H 1	He 2	
2			Li 3
3			Na 11
4			K 19
5			Rb 37
6			Cs 55
7			Fr 87

←-----Table-1

Groups \ Periods	VIIIB	0B
1		
2	F 9	Ne 10
3	Cl 17	Ar 18
4	Br 35	Kr 36
5	I 53	Xe 54
6	At 85	Rn 86
7		

←-----Table-2

In above first part of s-block as well as first part of modified periodic table in Table-1 and last part of p-block as well as last part of modified periodic table in Table-2 has been shown. Here it is stated that the rest part of modern periodic table remain unchanged in this respect.

### V. Conclusion

In this modified arrangement there is not any vacant place exist in between H and He in periodic table. Moreover He can be placed in s-block with its s-block type electronic configuration i.e.  $1s^2$ . As well as H can also be placed in a perfect group (group-O) which is located in between group-VIIIB i.e. the group of strong electro-negative elements and group-IA i.e. the group of strong electro-positive elements with respect to its dual characteristics (i.e. the chemical behaviours of H; which can behave sometimes as electro-positive and sometimes as electro-negative), surrounding with group-0B and group-0A. Moreover locations of group-0B and group-0A can remove the limitation of situation (location) of H in modern periodic table in this way that the groups of strong electro-negative elements (group-VIIIB) and strong electro-positive elements (IA) cannot be started directly before and after the group of element of dual characteristics (i.e. group-O); rather there must be present two sub-groups (i.e. 0B and 0A) of the zero (0) group as boundary lines.

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