

## Sketch of the Largest Periodic Table

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**Abstract:** This paper is a review written on the defects of the Modern Periodic Table. It also shows the solution of the errors by introducing two specific Sections (A&B) in place of arrangements of four current blocks (s, p, d & f).

**Keywords:** The Modern Periodic Table, Electronic Arrangements of Elements, Distribution of Blocks (s, p, d & f), Logical Approach of Sections-A&B, CAS-System.

### I. Introduction

Although the Modern Periodic Table is divided into four specific blocks i.e. s, p, d & f; but according to electronic arrangement of the elements it cannot be completely free from defects due to special behaviors and exceptional electronic arrangements of some elements. The limitations of the Periodic Table are noticed in case of the placements of Hydrogen (H), Helium (He) and f-block elements (from Ce to Lu & from Th to Lr). H is a s-block element. But H is placed in both of the groups of alkali metals and halogens (located at p-block) due to its dual characteristics. He is placed in the group of noble gas, located at p-block; where is also a s-block element. Again f-block elements are placed in a unique group, located at d-block. The main defect of the Periodic Table is to place the elements of different blocks in a same group. This error can reduce the universality of the Modern Periodic Table.

### II. Largest Periodic Table

The status of the Periodic Table is watched by specific behaviors and electronic arrangements of the elements. Actually arrangement of the groups of the Periodic Table can also depend on it. In this respect, any exceptional nature (including electronic arrangement) of the elements directly influences on that arrangement. So it is very difficult to divide the Periodic Table clearly into s, p, d & f-blocks; rather it is necessary to find an alternative way to solve the problem.

However the Periodic Table is clearly divided into two sections (Section-A & Section-B) in place of presentation of separate blocks. Moreover the elements of same block are placed in a unique group with respect to their chemical natures. e.g. He is placed in a separate group and the other noble gases are placed in another group. H is located at a specific group alone. Again f-block elements are placed in separate groups inside the Periodic Table after removing them from the group of d-block. Here s & p-elements are placed inside Section-A, where d & f-elements are placed inside Section-B. In this arrangement Section-A can be divided into two separate parts named as Block-A<sub>1</sub> & Block-A<sub>2</sub>; but Section-B cannot be divided. Although the Periodic Table cannot be divided into s, p, d & f-blocks; but to discuss easily it is considered that the groups of s, p, d & f-elements inside Section-A & B are located at s, p, d & f-clusters. It is nothing but an alternative way of separation of the blocks, mentioned in early arrangement. The whole situation of the Periodic Table is arrayed smoothly by CAS-System. This Periodic Table finally expresses ten groups with their sub-groups-A & B.

The main suitability of the largest Periodic Table are :

- i) The position of H preserves the completeness of the dividing stairs-line in between metals and non-metals.
- ii) No group can exist as a mixture of the elements of different blocks (s, p, d & f). So the clusters of groups in each Section are more symmetric with respect to adjustment.
- iii) **A. Section-A (Block-A<sub>1</sub> & Block-A<sub>2</sub>):**
  - a) cluster-s : color notation-blue, electronic arrangement –  $ns^{1-2}$ , groups – IA, IIA, IIIA & XA.
  - b) cluster-p : color notation-red, electronic arrangement –  $ns^2np^{1-6}$ , groups – IVA, VA, VIA, VIIA, VIIIA & IXA.
- B. Section-B :**
- c) cluster-d : color notation-green, electronic arrangement –  $(n-1)d^{1-10}ns^{1-2}$ , groups – IIIB, VIB, VIIB, VIIIB, IXB, XB, IB & IIB.
- d) cluster-f : color notation-yellow , electronic arrangement –  $(n-2)f^{1-14}(n-1)d^{0-1}ns^2$ , groups – IVB & VB.
- iv) The arrangement of the elements of f-block is independent. Moreover their locations are in separate places; which can obey the Periodic Law.

### III. Summary

This largest Periodic Table gains some more success over the current Modern Periodic Table in reality. H is located at a specific group alone in middle place between the groups of alkali metals and halogens to explain its dual characteristics. He is also placed in a special group, separated from p-elements (other noble gases); as well as it is located as boundary in between the groups of alkali metals (high electro-positive) and halogens (high electro-negative). Again f-block elements are placed in new groups, separated from the group of d-block elements. Moreover in this arrangement, f-elements are clearly located inside the Periodic Table with their independent groups. It is more suitable with electronic arrangements of the elements. Thus the largest Periodic Table may successfully reach the top of universality.

### References

- [1] Primo Levi, The Periodic Table, Schoken Books (1984).
- [2] Adrian Dingle, The Periodic Table : Elements with Style, Kingfisher Publications (UK) & Macmillan (US) (2007).
- [3] Eric R. Scerri, The Periodic Table : Its Story and Its Significance, Oxford University Press (2006).