Discoid Periodic Table Of Elements

Statement:

"The orbital periodicity of the elements are the periodic function of their atomic number."

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History:

The periodic table is an arrangement of the chemical elements, structured by their atomic number, electron configuration and recurring chemical properties. In the basic form, elements are presented in order of increasing atomic number, in the reading sequence.

In 1789, Antoine Lavoisier, now known as the 'father of modern chemistry,' publishes a list of 33 elements or "simple substances," as he calls them.

In 1829, a German Chemist Wolfgang Döbereiner working in Jena, began to formulate one the earliest attempts to classify the elements, he found that he could form some of the elements into groups of three, with the members of each group having related properties. He termed these groups triads.

In 1864, British chemist John Newlands presented a classification of the 62 known elements. Newlands noticed recurring trends in physical properties of the elements at recurring intervals of multiples of eight in order of mass number; based on this observation, he produced a classification of these elements into eight groups. Each group displayed a similar progression; Newlands linked these progressions to the progression of notes within a musical scale.

In 1864, Lothar Meyer first table contained just 28 elements, organized by their valency (how many other atoms they can combine with). These elements were almost entirely main group elements, but in 1868 he incorporated the transition metals in a much more developed table. This 1868 table listed the elements in order of atomic weight, with elements with the same valency arranged in vertical lines, strikingly similar to Mendeleev's table. But unfortunately, his work wasn't published until 1870, a year after Mendeleev's periodic table had been published.

In 1869, Dmitri Mendeleev, a Siberian by birth, working in St. Petersburg, Russia, publishes his first of many periodic tables and predicts the existence of four new elements that he provisionally names eka-aluminum, eka-silicon, eka-boron, and eka-manganese. Within fifteen years, the first three of these elements are discovered by other chemists and are called respectively gallium, scandium, and germanium, thus serving to solidify Mendeleev's reputation as the leading discoverer of the periodic table. The fourth of his initial predictions is synthesized in 1937 and named technetium.

It wasn't until 1913, six years after Mendeleev's death that the final piece of the puzzle fell into place. The periodic table was arranged by atomic mass, and this nearly always gives the same order as the atomic number. However, there were some exceptions which didn't work. Mendeleev had seen that they needed to be swapped around, but it was Moseley that finally determined why. He fired the newly-developed X-ray gun at samples of the elements, and measured the wavelength of X-rays given. He used this to calculate the frequency and found that when the square root of this frequency was plotted against atomic number, the graph showed a perfect straight line. He'd found a way to actually measure atomic number.

Introduction:

The Modern Periodic Table has provided tremendous number of practical benefits. Many Periodic table before were also represented for this reason, due to which we have been able to study the properties of chemical elements more properly. But they were all fruitful only for the time being as they were not perfect and carried some defects.

Defects of The Modern Periodic Table:

Here is a list of the defects of the Modern Periodic Table;

- Uncertainty of Hydrogen:

In almost every Periodic Table that was published, the position of Hydrogen always remained a dispute, as it shares many physical and chemical properties with other elements.

- Displaced "La" and "Ac" series:

The Lanthanide and Actinide series are a series of elements which are located at the bottom of the Modern Periodic table is because of their properties and in the block in which electrons fill up. The reason why inner-transition metals are located at the bottom of the periodic table, separated from the rest is because they all fill the f-block.

- Misplaced Helium:

Hydrogen isn't the only element which is facing a misplacement issue. Helium is placed at VIII-A (or 18) Group of the Periodic Table because it is a Noble gas like the rest of its family members. But, ever since the Molecular Orbital Theory was discovered Helium started to face a displacement issue. The reason for this cause is that Helium according to orbital theory is an s-block element but where it is placed, are all p-block.

- Messed Group B:

The elements in group VIIIB, which contains three columns, probably has the most exceptions when it comes to correlating group number to oxidation state. If you look at oxidation numbers, these metals can have a wide range of oxidation states. However, most of them display the same main oxidation state.

So now what?

Because of these defects, difficulties are faced in understanding the Periodicity in the Periodic Table. But surely there must be a better substitute for this problem, for which reason the Discoid Periodic Table of Elements is the better substitute as it covers all the defects.

What's so special?

What makes this table so special is that it shall eradicate all the previous defects of the Modern Periodic Table, and will be highly useful for a very long period of time.

Why Discoid?

Years before Mendeleev's publications, there was plenty of experimentation with alternative layouts for the elements. Even after the table got its permanent right-angle flip, folks suggested some weird and wonderful twists. One of them are Circular in shapes.

Discoid means circular in shape, and there is a great reason for choosing such a shape. The term "Periodicity" itself means "To occur in intervals", and if you walk around in a circle, you will find that you will return to the point from where you started at.

Similarly, if the elements are also arranged in such way, then we shall experience more periodicity in the elements than before.

Periodic Structure:

This table instead of having "Groups" and "Periods" possesses "Families" and "Arcs" for the representation of elements.

All the elements in column shall be identified vertically by their Family name by using the top element name.

i.e., Lithium Family, Beryllium Family, and so on.

Similarly, elements shall be identified horizontally by using the number of arcs.

i.e., 1^{st} arc, 2^{nd} arc, etc.

The periodic table shall be divided into two parts, namely Part "A" and Part "B".

Part "A" represents the Representative elements, whereas Part "B" represents the Transition metals.

Salient Features:

Now, let's list the features of this Periodic table, of it has removed all the defects of the previous table.

- Proper Position of Hydrogen:

Hydrogen has always remained a dispute among some Groups as it shares many similarities among them. But it could only be placed in any one of them, so as for this reason it was either placed in Group-I A or as separate block at the top.

But Discoid Periodic table has solved this long-time issue by placing it at the center of the table, from where it shall share many interstitial chemical properties with other elements of different Families. There is a sense that Hydrogen underlies everything rather than being the first element, because the chemical elements are mostly formed via the fusion of H and He

- Placement of "La" and "Ac":

The Lanthanide and Actinide series are a series of elements placed outside the Periodic table, because they are Radioactive and mostly man-made, moreover they are f-block elements.

This huge problem also got resolved by dividing the table into two portions, which provides plenty of space. Moreover, it doesn't disturb the overall periodicity of the Table.

- Better Position of Helium:

Helium also carried some similar problem. Helium is an element of Group-VIII A and share the same chemical properties as it's a Noble gas itself, but according to electronic configuration it's an s-block element but all the other Noble gases are p-block.

This issue has been resolved by placing Helium in the 1^{st} arc with Hydrogen, so now it will be in the s-arc and shall be connected with its Group.

- Modification of Group-B:

Group-B carries the most defects of all, because the Group starts from III B to VIII B, then comes I B and II B. Moreover, the Group-VIII B occupies three columns rather than one.

This defect is solved by Part "B" which has no Groups (or Families) because there is no need of it. All Transition metals are almost chemically and physically same, with no big difference.

Different, yet the same:

The table though in appearance may look something new and extra-ordinary, but in closer look is the same in terms of Periodicity as only the structure has been changed which eliminated the defects.

Side Features:

- An attractive look which is psychologically important to understand and learn. Moreover, if you rotate the table a little bit, it may look like a medal or an ancient Egyptian artifact.
- Compact and small as compared to the previous table.
- Can accommodate more elements by adding another arc.

Conclusion:

In Conclusion, from the above discussion it can be said that this Table, shall remove all the defects which the previous Periodic Table uphold. Furthermore, it shall be viable for a long period of time. This version of the Periodic Table reflects the ongoing scientific endeavor to classify the world around us.