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ISSN: 2329-6798
Modern Chemistry & Applications

Commentary

Introduction to Distribution of Chemical Elements in Periodic System

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DESCRIPTION

One of the major problems in modern chemistry is the systematization of chemical elements. This seems very natural since all known chemicals are made up of elements. As is well known, the basis of the system of chemical elements is the D.I. Periodic Law. This is the most rigorous modern formulation. Most properties of chemical elements depend almost periodically on the charge of the corresponding nuclide. The peculiarity that distinguishes this law from many other laws of physics is that no rigorous mathematical formula has yet been found that accurately and quantitatively relates these properties to the serial numbers of the elements in the periodic table. So, about 150 years after the discovery of the periodic law, various interpretations have been proposed, including various so-called periodic tables.

Other formats have also been proposed at various times. However, they did not receive significant popularization among professional chemists and other researchers. The earliest was the tabular form proposed by Mendeleev himself in his classical works. On this basis, what is known today as the short-term version was drawn up after his death and was later incorporated into all chemistry textbooks and dominated for a long time. The chemical elements are divided into eight groups and seven so called periods, the last period, the seventh period, not yet completed. In 1905, Werner proposed a slightly different interpretation of the periodic law, the so-called long period version. In this interpretation, in the same seven cycles he already had 18 groups of chemical elements. We do not elaborate here on these and other tabular peculiarities involving chemical elements and the determination of their positions, but within the framework of modern structural theory of atomic structure, all elements fall into four categories according to their structure Note that it is classified as the outer electron shells of those atoms, whose electrons can participate in the formation of chemical bonds. A chemical element is determined by two parameters such as the nuclear charge Z, which corresponds to the element's atomic number, and its maximum possible oxidation degree. This approach was very justified, and the system of chemical elements turned out to be harmonious and logical overall. However, the maximum degree of oxidation of a chemical element is only one of its properties and, like many others, a manifestation or consequence of the same cause, the electronic structure of the atoms of the chemical element. Mendeleev clarified the fact of regular changes in chemical elements with changes in atomic weight and formulated the law of periodicity, but could not explain the reasons for periodicity. Moreover, this was not due to lack of talent or imagination. The point is that a rigorous theory of atomic structure is necessary to understand the nature of a given phenomenon, but it only began to develop after 20 years and was fairly complete by the 1920s, when Mendeleev died. Moreover, since he had constructed his own system and had no data on the causes of the phenomenon, given that the periodic repetition of the properties themselves seems most evident, this sequence I was forced to concentrate.

CONCLUSION

Such a property turned out to be of greatest value at the time, but even as a second parameter in the construction of systems of chemical elements, it was not without cost. Due to the ambiguity, the notion of valence has been replaced by the more appropriate notion of degree of oxidation. This is the unit of electrical charge, especially as stated in many studies. Within each framework that conditionally exists, in this compound, two chemical intermediate two-electron bonds formed by an exchange mechanism, an electron transfer from a perfect less electronegative atom to a more electronegative atom happens. However, it has a huge advantage over D.I. Mendeleev. This is directly related to the properties of Atomic Orbital (AO) filling by electrons and thus to the electron configuration of the atom, taking into account both the number of electrons in the outer layer and the area in which they are located. This is one of the properties he should use as the second parameter when building a system of chemical elements.

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Received: 27-Jan-2023, Manuscript No. MCA-23-20592; **Editor assigned:** 30-Jan-2023, PreQC No. MCA-23-20592 (PQ); **Reviewed:** 13-Feb-2023, QC No. MCA-23-20592; **Revised:** 20-Feb-2023, Manuscript No. MCA-23-20592 (R); **Published:** 28-Feb-2023, DOI: 10.35248/2329-6798.23.11.399

Citation: Ostabel M (2023) Introduction to Distribution of Chemical Elements in Periodic System. Modern Chem Appl. 11:399.