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**Computation of Absolute Radii of 103 Elements of the Periodic Table in terms of Nucleophilicity Index'**

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**Abstract**

The size of an atom is a very significant parameter in associating and understanding a wide range of atomic or molecular physico-chemical properties. Considering importance of the size descriptor, an ansatz to compute absolute radius (r) in terms of nucleophilicity index (N) is proposed in the present work for atoms of 103 elements of periodic table. We have followed a very simple empirical approach to compute the absolute radii of the elements invoking regression analysis the new set of radii satisfy all the sine qua non of periodic properties. Relativistic effects are pronounced in the computed radii. A close agreement is noted on comparing the computed data with the existing scales. A strong quantitative correlation is observed with ionization potential and electronegativity for the computed data. Moreover, the absolute radius calculated in the present effort is employed in calculating internuclear bond distance, a real field descriptor, for several heteronuclear diatomic molecules. A significant agreement between the theoretically computed and experimentally determined internuclear bond distances is observed, thus corroborating the consistency of our proposed model.

**Keywords:**

Periodicity, Atomic radius, d-and f-block contractions, Ionization potential, Electronegativity, Relativistic effect, Internuclear bond distance.

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