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**Atomic Polarizability: A Periodic Descriptor**

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**Abstract**

Atomic polarizability is an essential theoretical construct to define and correlate many physicochemical properties. It exhibits periodicity and has a relationship with other periodic descriptors. Although a number of scales are available to compute atomic polarizability, the final scale is yet to be designed. In this venture, we have invoked a new empirical approach to compute the atomic polarizability of 103 elements of the periodic table, considering the conjoint action of other periodic descriptors, namely effective nuclear charge (Zeff) and absolute radii (r). The proposed approach is α=a[(r3/Zeff)e2]+bα=a[(r3/Zeff)e2]+b, where “e” represents the electronic charge, Zeff is the effective nuclear charge, r is the absolute radius, and α is the polarizability. Our computed atomic polarizability follows all sine qua non of the periodicity. Our model significantly exhibits the relativistic effect too. A close agreement between our computed data and other available theoretical and experimental results demonstrates the efficacy of our proposed approach. Furthermore, we have established the polarizability equalization principle in terms of our computed data.

**Keywords:**

A[tomic radii](https://journals.sagepub.com/keyword/Atomic+Radii), E[ffective nuclear charge](https://journals.sagepub.com/keyword/Effective+Nuclear+Charge), P[eriodicity](https://journals.sagepub.com/keyword/Periodicity), P[olarizability](https://journals.sagepub.com/keyword/Polarizability), P[olarizability equalization principle](https://journals.sagepub.com/keyword/Polarizability+Equalization+Principle)

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