polarizability

The ease of distortion of the electron cloud of a *molecular entity* by an electric field (such as that due to the proximity of a charged reagent). It is experimentally measured as the ratio of induced dipole moment (μ_{ind}) to the field E which induces it:

$$\alpha = \mu_{ind}/E$$

The units of α are $C^2\ m^2\ V^{-1}$. In ordinary usage the term refers to the 'mean polarizability', i.e., the average over three rectilinear axes of the molecule. Polarizabilities in different directions (e.g. along the bond in Cl_2, called 'longitudinal polarizability', and in the direction perpendicular to the bond, called 'transverse polarizability') can be distinguished, at least in principle. Polarizability along the bond joining a substituent to the rest of the molecule is seen in certain modern theoretical approaches as a factor influencing chemical reactivity, etc., and parametrization thereof has been proposed.

See also *electric polarizability.*

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