

Lewis Basicity and Affinity Scales: Data and Measurement

Christian Laurence, Jean-François Gal



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Lewis Basicity and Affinity Scales: Data and Measurement Christian Laurence, Jean-François Gal The Lewis concept of acids and bases is discussed in every general, organic and inorganic chemistry textbook. This is usually just a descriptive treatment, as it is not possible to devise a single numerical scale suitable for all occasions. However quantitative Lewis acid-base chemistry can be developed by compiling reaction-specific basicity scales which can be used in specific branches of chemistry and biochemistry.

*Lewis Basicity and Affinity Scales: Data and Measurement*brings together for the first time a comprehensive range of Lewis basicity/affinity data in one volume. More than 2400 equilibrium constants of acid-base reactions, 1500 complexation enthalpies, and nearly 2000 infrared and ultraviolet shifts upon complexation are gathered together in 25 thermodynamic and spectroscopic scales of basicity and/or affinity. For each scale, the definition, the method of measurement, an exhaustive database, and a critical discussion are given. All the data have been critically examined; some have been re-measured; literature gaps have been filled by original measurements; and each scale has been made homogeneous.

This collection of data will enable experimental chemists to better understand and predict the numerous chemical, physical and biological properties that depend upon Lewis basicity. Chemometricians will be able to apply their methods to the data matrices constructed from this book in order to identify the factors which influence basicity and basicity-dependent properties. In addition, measured experimental basicities and affinities are essential to computational chemists for the validation, calibration and establishment of reliable computational methods for quantifying and explaining intermolecular forces and the chemical bond.

Lewis Basicity and Affinity Scales: Data and Measurement is an essential single-source desktop reference for research scientists, engineers, and students in academia, research institutes and industry, in all areas of chemistry from fundamental to applied research.

"The book is a noteworthy piece of work and represents a timely and vast accumulation of knowledge regarding Lewis bases that brings together accurate thermodynamic and spectroscopic data on typical reference Lewis acids. As such, it should serve as a useful and general guide to basicity." J. AM. CHEM. SOC. 2011, 133, 642

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