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Book review

Correlation Analysis in Chemistry: Recent Advances

Edited by N.B. Chapman and J. Shorter. Plenum Press, New York, 1978, U.S. \$49.50.

This book is a sequel to Advances in Linear Free Energy Relationships, (published in 1972) and differs from it in giving a greater in-depth treatment of specialized topics, the literature to 1975 being covered in most chapters. For the correlation enthusiast this volume gathers together practically all that they are ever likely to need to refer to, the topic of each chapter being comprehensively surveyed.

The appeal to organometallic chemists will obviously be limited to those whose work encompasses quantitative studies. For them the chapter entitled 'A Critical Compilation of Substituent Constants', by O. Exner, is a must and contains for example the σ_m , σ_p , σ_R^o , and σ_I values for some 540 substituents. There are also extensive tables of σ^- and σ^+ values, though these do contain some notable omissions, perhaps inevitable in a work of this dimension. The chapter on 'Multiparameter Extensions of the Hammett Equation', by J. Shorter gives a valuable resumé of a topic which tends in particular to baffle those not very familiar with LFER. It may be noted that some of the most convincing evidence for the need for multiparameter treatments comes from studies in organometallic chemistry.

'L.F.E. Relationships as Tools for Investigating Chemical Similarity - Theory and Practice', by S. Wold and M. Sjöström deals with the vexing problems of plots, least squares, deviation from linearity, goodness of fit etc. and ought to be compulsory reading, especially for those inclined to dismiss deviations from their cherished theories as 'experimental error', a point also stressed by Shorter. The constancy of substituent effects in cleavage of compounds $YC_6H_4\{C(\equiv C)_n\}MEt_3$ ($n = 1-3$, $M = Si$ or Ge) has cast doubt upon the validity of separating substituent effects into inductive/field and resonance components. Results such as these have prompted M. Godfrey

to propose an alternative model (which emphasizes the non-Coulombic influences of substituents) and this is reviewed in this volume. 'The Correlation Analysis of Nucleophilicity' by C. Duboc, with its survey of attempts to arrange nucleophiles into reactivity orders, should be particularly useful to the organometallic chemist.

The remaining chapters are "The Brönsted Equation - Its First Half Century", by R.P. Bell, 'Applications of L.F.E.R. to Polycyclic Arenes and Heterocyclic Compounds' by M. Charton, 'Substituent Effects in Olefinic Systems' by G.P. Ford, A.R. Katritzky, and R.D. Topsom, 'Correlation of u.m.r. Chemical Shifts with Hammett σ Values and Analogous Parameters' by D.F. Ewing, and 'Recent Advances in Biochemical Quantitative Structure-Activity Relationships' by C. Hansch, and each can be recommended. The latter chapter in particular is commended to those who seek a practical application of L.F.E.R. For as far as the pharmaceutical industry is concerned 'there's money in them there constants'.

This book is well produced, nicely printed and is essential for all libraries. Workers in the field will want their own copies, though the price will preclude many from satisfying this desire.

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