Computer Software Reviews

Intelement 1.1. X-Pert Engineering Software: 68 Birr St., Rochester, NY 14613. List price $250.00 with an introductory discount of 50% and a 15-day trial period before billing.

Intelement is an interactive periodic table and element data-base system. It displays element properties or creates lists of elements with properties in selected ranges. Lists can be combined by union, intersection, or difference. Resultant lists can be named, displayed, printed, or stored. It covers 18 commonly used atomic and bulk physical and chemical properties, with no option for addition of new properties or alteration of values. The data-base ignores allotropes and polymorphs.

FEATURES: The program, on one $5^1/_4$ in. floppy, runs on an IBM-PC XT, AT, or compatible microcomputer with MS-DOS 2.2 (or higher), EGA or CGA or Hercules graphics, at least 512K RAM, and a single floppy drive. A printer is optional. The disk is not copy protected. The program is easy to start and moderately easy to learn and to run. Control is by function key, typed command, or pop-up menu selection. There is no indication of the algorithms or implementation language. The user interface is poorly designed, with inconsistent conventions, inadequate prompts, no error messages, and several minor bugs. None of these faults prevent use of the program. The package appears to be of some value to materials scientists, engineers, and metallurgists concerned with applied materials design.

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Book Reviews*

Mechanisms of Inorganic and Organometallic Reactions. Volume 5. Edited by M. V. Twigg (Imperial Chemical Industries P.L.C.). Plenum: New York. 1988. XVII + 466 pp. $85.00. ISBN 0-306-42841-5.

This book provides a review of work published during 1985 and 1986 concerning the mechanistic aspects of inorganic and organometallic reactions in solution. This volume consists of 15 chapters grouped into 4 parts, written by 19 prominent organometallic chemists from the U.S.A., United Kingdom, Federal Republic of Germany, New Zealand, and Australia.

The first Part (Chapters 1–3) covers electron-transfer reactions. R. D. Cannon reviews in the first chapter the general aspects of electron transfer. Chapter 2, by A. G. Lappin, introduces the redox reactions between two metal complexes. Metal–ligand redox reactions are covered by A. Bakac and J. H. Espenson in Chapter 3.

Part two (Chapters 4–9) covers substitution and related reactions. N. Winterton discusses in Chapter 4 the reactions of compounds of the nonmetallic elements B, C, Si, Ge, N, P, As, Sb, O, S, Se, Te and halogens. The fifth chapter, by R. J. Cross, deals with substitution reactions of inert-metal complexes containing coordination numbers 4 and 5, whereas Chapters 6, 7, and 8, by D. House, R. W. Hay, and J. Burgess, respectively, review the substitution reactions of inert-metal complexes containing coordination numbers of 6 and above, such as Cr, Co, V, Fe, Ni, Tc, Ru, Rh, Pd, Os, Ir, and Pt. Chapter 9, by S. F. Lincoln, deals with the substitution reactions of labile metal complexes.

The third part (Chapters 10–14) covers the reactions of organometallic compounds. D. J. Darensbourg and D. J. Mangold in Chapter 10 focus on the substitution and insertion reactions. Chapter 11 by D. A. Sweigart and N. J. Stone describes metal–alkyl and metal–hydride bond formation and fission. In addition, this chapter is concerned with oxidative addition and reductive elimination involving two metal centers. The next chapter, by L. A. P. Kane-Maguire, reviews the kinetic and mechanistic studies on the stoichiometric reactions of coordinated hydrocarbons with nucleophiles and electrophiles. Chapter 13, by B. E. Mann, reviews the rearrangements, migrations, intramolecular exhange, and isomerizations of organometallic compounds. D. P. Riley and S. J. Tremont, in Chapter 14, focus in detail on the homogeneous catalysis of many organic reactions by complexes of metal ions, such as the reactions involving carbon monoxi e, hydrogenations, oxidations, isomerization reactions, oligomerizations of olefins and alkynes, carbon–carbon bond forming reactions, hydrosilylations, and hydrocyanation reactions.

The final part of this book (Chapter 15), by R. Von Eldik, compiles the activation and reaction volume data for inorganic and organometallic reactions.

In addition, this book lists all the references for every single chapter at the end of the book. The total number exceeds 2700 references. Also, this book contains 14 pages of subject index.

In summary, the editor has done a good job of planning and organization of different subjects in this volume. Overall, this book should be of interest to those chemists presently working in the field of organometallic chemistry.

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*Unsigned book reviews are by the Book Review Editor.

Solubility Data Series (IUPAC). Volume 30. Alkali Metal Halates, Ammonium Iodate and Iodic Acid. Edited by H. Miyamoto and M. Salomon. Pergamon: Oxford and Elmsford. 1987. xxiv + 510 pp. $120.00. ISBN 0-08-029210-0.

The solubilities of the chlorates, bromates, and iodates of lithium, sodium, potassium, rubidium, and cesium, plus ammonium iodate and iodic acid, are reported in the detailed, consistent, and critically evaluated form characteristic of this series. The solvents are in most cases water or aqueous solutions of electrolytes, but some other solvents, such as sulfolane and dimethylformamide, are included. The usual indexes of authors, compounds, and CAS Registry Numbers complete the book.

Solubility Data Series (IUPAC). Volume 32. Hydrogen Sulfide, Deuterium Sulfide, and Hydrogen Selenide. Edited by P. G. T. Fogg and C. L. Young. Pergamon: Oxford and Elmsford. 1988. xvi + 352 pp. $120.00. ISBN 0-08-0324819.

Nearly half of this book is devoted to the solubility of hydrogen sulfide in aqueous systems (water, solutions of weak electrolytes, solutions of strong electrolytes, solutions of ammonia, or "alkanolamines"). Solubility in nonaqueous solvents, from hydrocarbons through various functional types to phosphorus compounds, occupies almost as much space. The customary critical evaluation and uniform presentation characterize this work, which reports data published through 1986. The usual indexes of authors, compounds and CAS Registry Numbers are included.

Solubility Data Series (IUPAC). Volume 33. Molten Alkali Metal Alkanoates. Edited by Paolo Franzosini. Pergamon: Oxford and Elmsford. 1988. xxiv + 348 pp. $120.00. ISBN 0-08-032522X.

The alkali metal salts of alkanecarboxylic acids are characterized by polymorphism, and the phase diagrams for their mixtures with water and other substances are inclined to be complex. These facts are given a thorough discussion in the preface. The bulk of the book is devoted to the usual detailed, critical presentation of reported data, most of which is for formates and acetates in water and solutions of other electrolytes.

The indexes of authors, CAS Registry Numbers, and compounds are included, but the last, which should be the most helpful, is in fact less so than it might be, owing to the lack of cross-referencing. It is alphabetic by inverted name ("acetic acid, sodium salt") and uses only Chemical Abstracts Index names. The entries in the text, however, use different names. For example, what is listed in the index as "butanoic acid, 2-methyl, sodium salt" is identified in the heading of the data entry as "sodium iso.pentanoate (sodium isovalerate)". The first of these is a hybrid name unacceptable by any system, and the second name corresponds to sodium 3-methylbutanoate, not the 2-methyl isomer entered in the index. It is not possible to resolve the ambiguity without going to the original literature, for the editorial policy is to give only empirical formulas ("Na-*i*-$C_5H_8O_2$") rather than definitive structural formulas. This is a serious flaw in an otherwise admirable work and detracts from its usefulness and reliability. In the simpler cases of acetates and formates, the index names them as such ("acetic acid, sodium salt"), exactly as does Chemical Abstracts and as preferred in the IUPAC Blue Book,