Axum. Version 2.0. TriMetrix: 444 NE Ravenna Blvd., Suite 210, Seattle, WA 98115. List Price $495.00.

Axum is a technical graphics and data analysis package for MS-DOS (IBM compatible) systems. The program allows users to import data from a variety of sources, edit data, perform statistical analysis on the data, develop customized 2D,3D contour, pie, and polar plots, and either plot the graphs on an external device or export graphs to other applications.

Requirements. The program can be installed on IBM PX, XR, ZT, PS/2, and compatible systems (Intel 80286, 386, and 486 systems). It requires DOS 3.0 or higher, 640K system memory, and 5 Mb of hard disk space. The program can be used with a wide variety of graphics cards and compatible monitors including CGA, Hercules, EGA, and VGA. The program does make use of extended and expanded memory and, in practice, more than 640K is necessary for efficient operation. A math coprocessor is recommended. While AXUM is designed to be run directly from DOS, it can be run successfully under Windows 3.0 and directly from DOS, and it can also be run successfully under Windows 3.0 and 3.1. We evaluated the program on a 80286 system without a coprocessor and a 80486 (33 MHz) with a VGA monitor. Without a coprocessor the program operates too slowly on the 286 to be of value.

Documentation. A 592 page manual is provided with the program disks. The manual is very well prepared and is well indexed. In addition, appendices are provided discussing troubleshooting, optimization, curve fitting, math functions available, slide making, and batch processing. The manual includes a tutorial on the use of the program as well as several examples of different graph types. In addition, a concise overview of all commands is given and a chapter exists discussing the Axum programming language.

Data Editor. The program makes use of stacked menus to guide the user through its various functions. A limitation is that mouse control of menu selection is not supported (Something devotees of Windows might find frustrating). The main menu directs the user to choose either their Data or Graphics editors, modify the system setup, do DOS operations, or exit the program. The data editor is very similar to that of many database programs. Data files from Lotus and dBase can be directly imported as well as ASCII and FASCII files; the routine is versatile and efficient. Data can also be generated by evaluation of a function which is typed by the user. Manipulation of blocks of data is straightforward and extremely versatile. Columns of data can be analyzed by a variety of statistical routines including computation of a correlation matrix for a set of columns, computation of frequency distributions for a set of columns, and regression (linear, log, exponential, or polynomial) of data. The program also contains a text editor and has a programming language which can be used to operate on data, create new data, and do a variety of numeric and relational operations. The editor has functions for doing data smoothing by locally weighted regression, weighted average regression, 2D and 3D cubic spline, and Savitsky–Golay smoothing. In addition, functions exist for polynomial regression and regression of any equation that can be parametrized in a linear form. The results of statistical analyses can be displayed in columns within the database and include predicted values, residuals, etc. It should be noted that an exponential fit to 400 data points required less than a second on a 486 (33 MHz).

Graphics Editor. The graphics editor is also very versatile. To create a graph the user selects the type of plot desired from a menu and inputs columns of data to be graphed; multiple compatible plots may be placed on a single graph. Virtually every aspect of the graph sizing, labeling, ticks, colors, line widths, etc. can be specified for all the plot types supported. As stated above, a wide variety of plots can be created including bar charts, pie charts, histograms, contour and surface plots, 3D bar charts, contour plots, and many others. Once a graph is chosen and initial parameters are set, optimization of the graph may be performed using a very effective edit screen which allows complete editing and addition of titles, legends, comments, arrows, overlays, etc. Graph files can be stored in exportable formats including PIC, EPS, HPGL, GEM, TIFF, and TKF. In order to create stacked plots or arrays of plots graphs must be stored as image files (Uneditable forms); image files can be overlaid with an existing graph or a group of image files can be assembled in a specified user format. A shortcoming of the program is that it is not a Windows program so that cut and paste options are not available; the user must write a file in a format that can be read by the receiving program.

Overall, we feel Axum is a quality graphics program which is well suited for chemists wishing to produce publication quality 2D and 3D graphics. The Axum programming language makes the program useful for statistical analysis and simulation of data.

Aaron I. Baba and Russell H. Schmehl, *Tulane University*

Book Reviews *

Rodd's Chemistry of Carbon Compounds. Second Supplement to the Second Edition. Volume 1. Aliphatic Compounds. By M. Sainsbury (University of Bath). Elsevier: New York. 1991. xviii + 619 pp. $85.00, $39.95 (paperback). ISBN 0-444-88157-3.

The venerable *Rodd's Chemistry of Carbon Compounds* is at long last being updated by the issue of a second supplement. The explosive growth of organic chemistry since the first supplement in 1970 has let Rodd's recede from common use, becoming a curiosity located on the dustier of the library shelves. This second supplement is its chance to return to usefulness.

Volume 1 covers the hydrocarbons, halogen derivatives, alcohols, ethers, esters, sulfur analogs, and organometallic compounds. The nitrogen derivatives, though advertised on the cover, are postponed.

Each section covers the chemistry of that class of compounds. Occasional sections on toxicity, theoretical calculations, and physical properties come as a bonus in some sections.

Naturally, a book of this size cannot hope to be comprehensive. Whether it succeeds in its objective depends on the quality of the selection it makes and the discussion it gives. The choices made by these authors are sound. Many valuable leading references are here. In addition there are a number that will catch the eye of those who are just browsing. Discussion of the reactions are, of necessity, brief. Where the discussion is good, it is very good. A short section on the Wittig reaction is as neat an encapsulation of this process as you will find. The chapter covering aliphatic organometallics, for instance, is solid and provides a good overview of many important reactions.

Throughout the book, the references are plentiful and in the text, making them easy to locate. The index is substantial and well organized. The presentation is as good as any camera-ready format. The errors are minor and fairly few.

The second supplement will revive Rodd's. Libraries should buy it, and I think that many chemists will wish to add it to their private collections.

Roderick W. Bates, *University of North Texas*

Enzyme Engineering XI. Annals of the New York Academy of Sciences Volume 672. Edited by Douglas S. Clark (University of California, Berkeley) and David A. Estell (Genencor International). New York Academy of Sciences: New York. 1992. xvi + 660 pp. $160.00. ISBN 0-89766-764-6.

This book is developed from the Eleventh International Enzyme Engineering Conference held in Keauhou-Kona, Hawaii, on September 22–27, 1991. After an introduction by the editors, there are 91 contributions organized under the following headings: Enzyme Structure and Function; Improved Biocatalysts through Genetic Engineering; Enzyme Stability and Stabilization; Novel Applications of Enzymes and Enzymelike Molecules; Enzymes under Unusual Conditions; Applications of Enzymes in Synthesis; and Innovations in Biocatalyst Preparation and Bioreactor Design. There is also a list of contributors, but no indexes.

Nuclear Magnetic Shieldings and Molecular Structure. NATO ASI Series C: Mathematical and Physical Science Volume 386. Edited by J. A. Tossell (University of Maryland). Kluwer: Boston. 1993. xvi + 584 pp. $199.00. ISBN 0-7923-2119-7.

This book was developed from the Nato Advanced Research Workshop on the Calculation of NMR Shielding Constants and Their Use in the Determination of the Geometric and Electronic Structures of Molecules and Solids held in College Park, Maryland on July 20–24, 1992. After an introduction by the editor and a list of participants, there are 29 chapters of invited lectures and a single chapter of the abstracts of poster presentations in typescript form. There is also a short subject index.

*Unsigned book reviews are by the Book Review Editor.

Catalysis and Surface Characterisation. Edited by T. J. Dines, C. H. Rochester, and J. Thomson (University of Dundee). Royal Society of Chemistry: Cambridge, U.K. 1992. x + 292 pp. £47.50. ISBN 0-85186-335-3.

This book is developed from a meeting of the Royal Society of Chemistry, Surface Reactivity and Catalysis Group, held at Dundee University, 30 March to 1 April 1992. This book is a selection of the papers presented at the meeting, most of which employ FTIR, solid state NMR, X-ray methods, electron microscopy, and non-spectroscopic methods, like temperature programmed reduction. After a preface by the editors, there are 33 chapters and a short subject index in typescript form.

Catalytic Selective Oxidation. ACS Symposium Series 523. Edited by S. Ted Oyama (Virginia Polytechnic Institute and State University) and Joe W. Hightower (Rice University). American Chemical Society: Washington, DC. 1992. xiv + 464 pp. $109.95. ISBN 0-8412-2637-7.

This book was developed from a symposium sponsored by the Division of Petroleum Chemistry, Inc., at the 204th National Meeting of the American Chemical Society held in Washington, DC, on August 23–28, 1992. After a preface by the editors and an introductory chapter, there are 34 chapters organized under the following headings: Theories and Concepts in Selective Oxidation; Reactivity of Single Crystals and Well-defined Crystal Faces; Characterization of Oxidation Catalysts; Synthesis and Reactivity of New Materials; Activation and Selective Oxidation of C_1–C_4 Alkanes; and State-of-the-Art Engineering Concepts in Selective Oxidation. There are also author, affiliation, and subject indexes.

Pest Control with Enhanced Environmental Safety. ACS Symposium Series 524. Edited by Stephen O. Duke (U.S. Department of Agriculture), Julius J. Menn (U.S. Department of Agriculture), and Jack R. Plimmer (ABC Laboratories). American Chemical Society: Washington, DC. 1992. x + 358 pp. $84.95. ISBN 0-8412-2638-5.

This book was developed from the symposium sponsored by the Division of Agrochemicals at the 203rd National Meeting of the American Chemical Society held in San Francisco on April 5–10, 1992. After a preface and an introductory chapter by the editors, there are 23 additional chapters organized under the following headings: Weed Management; Insect Management; and Plant Pathogen Management. There are also author, affiliation, and subject indexes.

Handbook of Monolayers. Volumes 1 and 2. Edited by Anne-Francoise Mingotaud (University of Bordeaux), Christophe Mingotaud (Paul Pascal-CNRS), and Larry K. Patterson (University of Notre Dame). Academic Press: San Diego, CA. 1993. xxxii + 2726 pp. $175.00. ISBN 0-12-498304-9.

This two-volume set compiles 1300 compounds in the literature from 1978 to 1990 in which the monolayers were formed on an aqueous subphase at a gas–water interface and contained pressure–area isotherms with data expressed in (or could be converted to) units of A^2·molecule^{-1} or M^2·mg^{-1}. The data tables are organized into eight categories: (1) the number of the references from which data was taken for table entries; (2) the subphase which includes type, pH, temperature, and solutes; (3) the technique used for water purification and the resistance of the water in MΩ·cm; (4) the gas in contact with the interface and the relative humidity of the gas phase; (5) the numerical value and units for the speed of monolayer compression; (6) the principal component on the spreading solvent and whether the spreading solvent was pure or a mixture; (7) the origin of the product and the purity of the spread material; and (8) a listing of techniques and types of studies applied to monolayers of the molecule. The book is organized under the following chapter headings: fatty compounds; phospholipids; macrocyclic compounds; inorganic compounds; dyes; polymers; steroids; aminoacids and polypeptides; and other natural products. There are also indexes of common names and of functional groups.

The Dictionary of Substances and Their Effects. Volume 1. Edited by M. L. Richardson (Basic, United Kingdom) and Associate Editor S. Gangolli (Consultant, United Kingdom). Royal Society of Chemistry: Cambridge, U.K. 1992. xvi + 952 pp. £180.00. ISBN 0-85186-331-0.

This book is the first (covering substances alphabetically from A–B) in a seven-volume set with the remaining volumes to be published by 1995. It contains data and references on chemicals which have some impact on the environment and notes legislation requirements of the EC, USA, and Japan. The data are organized under the following headings: Identifiers; Physical Properties; Occupational Exposure; Ecotoxicity; Environmental Fate; Mammalian and Avian Toxicity; Legislation; Other Comments; and References. After an introduction and a description on how to use this book, there are data pages, a glossary of organism names, a list of abbreviations, an index of names and synonyms, an index of CAS registry numbers, and an index of molecular formulas.

Applications of Zeeman Graphite Furnace Atomic Absorption Spectrometry in the Chemical Laboratory and in Toxicology. Edited by Claudio Minoia (Fondazione Clinica del Lavoro, Pavia) and Sergio Caroli (Istituto Superiore di Sanita, Roma). Pergamon Press: New York. 1992. xxvi + 676 pp. $215.00. ISBN 0-08-041019-7.

This book is a collection of applications for the Zeeman GFAAS in areas such as the analysis of freshwater, seawater, rocks, soils, food, blood, urine, biological samples, and other specimens relevant to clinical and toxicological chemistry. After a preface by Niccolo Omenetto, there are 29 chapters organized under the following headings: Part I—Water, Food, Environment; and Part II—Biological Tissues and Fluids. There is a brief subject index.

Advances in Detailed Reaction Mechanisms. Radical, Single Electron Transfer and Concerted Reactions. Edited by James M. Coxon (University of Canterbury). JAI Press, Inc.: Greenwich, CN, and London. 1991. xi + 186 pp. $78.80. ISBN 1-55938-164-7.

This series is one of approximately 50 serial publications in chemistry by JAI Press under the consulting Editorship of Albert Padwa. The Advances present essays centered around the author's contributions to areas in which the author has achieved eminence. This volume has four excellent chapters concerning radicals: Radical Kinetics and Mechanistic Probe Studies by Martin Newcomb; Free Radical Reactions: Fragmentation and Rearrangements in Aqueous Solution by Martin Davies and Bruce Gilbert; α-Carbon-Centered Radicals from Amino Acids and their Derivatives by Christopher Easton; and Cycloaddition of Allenes: Reactions of Unusual Mechanistic Perspicuity by William Dolbier, Jr. The essays in the present volumes could well have been accommodated in other Advances such as *Advances in Free Radical Chemistry*, *Advances in Electron Transfer Chemistry*, or *Advances in Cycloaddition*. For a library to subscribe to all of the Advances published by JAI Press requires approximately $4000 if each series is issued annually. Consideration should be given to the possible saving in costs by consolidation where appropriate. Hopefully future volumes in this series will establish a more unique role for the collection of a series of essays under the title.

The present volume, which contains only occasional references after 1989, is highly recommended for all libraries and workers in the area of free radicals, electron transfer, and cycloadditions. The typescript is excellent although the formula style varies between chapters and is often wasteful of space. The chapters seem relatively free of errors although confusion in the use of the acronym $S_{RN}2$ instead of $S_{RN}1$ on p 16 warrants comment. A subject index is provided.

Glen A. Russell, *Iowa State University*