Book Review: Techniques of Chemistry. Edited by A. Weissberger. Vol. 2. Organic Solvents, Physical Properties and Methods of Purification. By J. A. Riddick and W. B. Bunger

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1 AUTHOR:

Christian Reichardt

Philipps University of Marburg

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1000 Fragen aus der Chemie (1000 Questions from Chemistry) By *W. Geissler* and *T. Reinholz*. J. F. Lehmanns Verlag, München 1971. 1st ed., v, 210 pp., numerous figures, bound DM 16.—.

About 170 questions on general chemistry, 230 on inorganic and analytical chemistry, and 600 on organic chemistry are given, with short answers, in about 200 pages. According to the preface, the questions are largely authentic examination questions from the medical courses of West German universities. In the reviewer's opinion, however, a number of the questions are rather irrelevant to the budding physician. In view of the tightening-up of the syllabus that is necessitated by the new Education Act, there will be an increasing need in the future for the subject matter of courses to be closely concerned with medicine.

The collection of questions will probably be of little interest to the medical student in the foreseeable future. This is the more regrettable in that the authors have taken a great deal of trouble in the preparation of the book, which they undoubtedly also intended to be of assistance to medical students. (However, the authors cannot be held responsible for the selection of the examination material.) This criticism in no way limits the usefulness of the book to the other groups for whom it is intended. This collection of questions will be a significant and reasonably priced aid to teaching candidates and first-semester chemistry students, and can be recommended with a clear conscience.

Klaus Beyermann [NB 77 IE]

Absorption Spectra in the Ultraviolet and Visible Region. Vol. XV. Edited by *L. Láng*. Academic Press, New York—London 1971. 1st Edit., 408 pp., numerous tables and spectra. Ring-bound, $ 27.50.

The present 15th volume contains almost 200 spectra of a wide variety of compounds (aromatic, heterocyclic, organometallic compounds, *etc.*). The spectra are reproduced as $\log \varepsilon/m\mu$ diagrams on loose A 5 sheets. The reverse of each sheet, in addition to the name of the substance, the molecular formula, the molecular weight, and the melting point, carries information about the instrument with which the spectrum was recorded and data on the solvent, the concentration, the light path, and (in tabulated form) a number of recorded values [wavelength ($m\mu$) and $\log I_0/I$]. The sheets are held together in a ring binder. A clear list of contents contains a substance index, an author index, and a formula index.

Like the entire series, the volume is a collection of spectra that will be useful to any chemist

Egon Fahr [NB 98 IE]

Malting and Brewing Science. By *J. S. Hough, D. E. Briggs,* and *R. Stevens* Chapman & Hall Ltd., London, 1971, 678 pp., about 250 figs., £ 10.—.

As the authors state, this book has been written to provide a suitable textbook for students of brewing sciene in Birmingham. Since a single book obviously cannot cover all the aspects of this subject, the emphasis here is on the scientific side rather than on analytical methods or the use of equipment.

The main topics, treated in 22 chapters, including the biochemistry and technology of malting and drying barley; brewing water; the chemistry and biochemistry of mashing; brewing sugars and sirups; the chemistry of wort preparations and hop extraction; the biology and metabolism of brewers' yeasts; the growth of yeast and the fermentation of beer; and the treatment and quality of beer.

This book gives a detailed account of the field from the British standpoint. It contains about 300 structural formulas and metabolic schemes, 250 illustrations of equipment, and some 1000 references. Unfortunately, the Continental contribution to modern brewing technology is hardly represented and it might have been better perhaps to include some authors who have a command of French, Czech, and German, so as to arrive at a more complete and balanced picture of the field—as has been done in "Barley and Malt" and "The Chemistry and Biology of Yeasts", edited by *A. H. Cook*, which were written by 29 authors.

Anton Piendl [NB 86 IE]

Water and Water Pollution. Vol. 1. Ed. by *L. L. Ciaccio*. Marcel Dekker, Inc., New York 1971. 1st edit., xix, 449 pp., numerous figs., bound $ 27.50.

The editor has succeeded in getting some of the leading American experts in water chemistry for this four-volume handbook. The first volume takes as a starting point the chemical, physical, and biological characteristics of water, and goes on to apply a blend of practical experience and theoretical fundamentals to specific situations such as estuaries and rivers, the influence of pollution on the aquatic ecosystem, and the utilization of water during excessive rainfall or ground water enrichment.

The current position as regards the evaluation of waste waters and their chemical, physical, and biological purification is illustrated.

Although on many points the book concerns itself specifically with the water industry in the USA—which differs in many respects from its West German counterpart—this first volume is still of direct value in the way in which it successfully combines theory and practice. The systematic layout and the extremely careful way in which the bibliographies to the individual chapters have been compiled make this book easy to use. It can be used as a working tool by the student and practising specialist alike. It is also clearly enough written to act as a chemical textbook for civil engineers. It is to be hoped that the remaining three volumes will soon make their appearance.

Wilhelm Husmann [NB 87 IE]

Techniques of Chemistry. Edited by *A. Weissberger*. Vol. 2. **Organic Solvents, Physical Properties and Methods of Purification.** By *J. A. Riddick* and *W. B. Bunger*. Wiley-Interscience, New York–London 1970. 3rd Edit., xiii, 1041 pp., numerous tables, bound £ 11.75.

Our increasing understanding of the influence exerted by solvents on chemical reactions, equilibria, and absorption spectra has led not only to more objective criteria for the selection of suitable solvents but has also resulted in a marked increase in the number of solvents available. While

the first edition of the present handbook[*] described 160 solvents and thereby covered the whole known field, the present, third edition reports the physical properties and methods of purification of 354 solvents.

After a brief classification of organic solvents with regard to their chemical constitution, which is used in the arrangement of the 354 solvents (Chapter 1, 18 pages), Chapter 2 (42 pages) gives a thorough discussion of the tabulated physical constants, the methods by which they are determined, and the criteria for their selection from the literature. Chapter 3 (491 pages) contains in tabular form an overall summary of all the constants characteristic of a solvent. Here are the physical constants needed for identification and checking of purity (melting and boiling points, refractive index, density, *etc.*), and also those required in physicochemical measurements (*e.g.* cryoscopic and ebullioscopic constants). All in all, some 45 individual items of information are provided for each solvent, including literature references to UV, IR, NMR, and mass spectra of the solvent in question, and the Beilstein reference. I found the seven following tables particularly useful; here all the solvents are arranged by increasing boiling point, melting point, and dipole moment, and also by increasing density, ebullioscopic and cryoscopic constants, and dielectric constant. In Chapter 4 (20 pages) there is a brief discussion of the concept of purity of a substance and criteria of purity, together with an enumeration of the general methods used for the determination of water in organic solvents, and for its removal. Finally, in Chapter 5 (306 pages) there is a detailed summary of the general and specific purification methods for all the solvents tabulated in Chapter 3, together with notes on their handling and storage (toxicity, flashpoint, explosion limits). A distinction is made in the methods of purification according to the purpose to which the purified solvent is to be put. This extensive work is concluded by a bibliography of over 5300 references, which covers the literature up to 1968 (Chapter 6, 132 pages), and by a subject index.

The authors have succeeded in taking the almost unmanageably great mass of material on the constants and methods used in the selection and purification of solvents, and assembling it critically in a readily comprehensible form. All the same, certain hopes remain unrealized. There are no data on deuterated solvents, and only a few on the solvent mixtures (ligroin, petroleum ether) commonly used in laboratory practice. A note on the empirical parameter of the solvent polarity would have been useful. Solvents with high dielectric constants dissociate well, but are not necessarily ionizing solvents, as is maintained on p. 57. The ionizing capabilities of a solvent are determined by factors other than the dielectric constant.

In conclusion, it may be said that the present book is a highly successful and considerably extended revision of its well-known predecessor. The assessment of the reviewer of the first edition may be repeated without reservation: "The book should represent an extremely useful source of information for anyone concerned with solvents"[*]

Christian Reichardt [NB 34 IE]

[*] Cf. Angew. Chem. *49*, 213 (1936).

Editorial office: Boschstrasse 12, 6940 Weinheim/Bergstr., Germany, Telephone 4036/4037, Telex 465516 vchwh d.

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