Book Reviews

Analytical Chemistry: An Introduction. By D. J. PIETRZYK and C. W. FRANK (University of Iowa). Academic Press, New York, N.Y. 1974. xx + 667 pp. $13.95.

Quantitative Analytical Chemistry. Third Edition. By J. S. FRITZ (Iowa State University) and G. H. SCHENK (Wayne State University). Allyn and Bacon, Inc., Boston, Mass. 1974. xiv + 689 pp. $14.95.

Chemical Separations and Measurements: Theory and Practice of Analytical Chemistry. By D. G. PETERS, J. M. HAYES, and G. M. HIEFTJE (Indiana University). W. B. Saunders Co., Philadelphia, Pa. 1974. xxii + 790 pp. $15.95.

Chemical Separations and Measurements: Background and Procedures for Modern Analysis. By W. E. HARRIS and B. KRATOCHVIL (University of Alberta). W. B. Saunders Co., Philadelphia, Pa. 1974. x + 284 pp. Paperback, $6.50.

For purposes of this review, the four books will be designated by the authors' initials.

In the preface, P&F is stated to be intended for a one-semester introductory course largely populated by students in the "health sciences," but usable by chemistry majors who will subsequently enroll in instrumental analysis. The other authors do not specify the planned level, but it is clear that they intend their books for chemistry major courses, but usable for premedical classes.

All except H&K contain fully adequate coverage of the theory and methodology of modern noninstrumental analytical chemistry. H&K, on the other hand, makes no attempt to cover theory except as it directly appertains to laboratory work. In agreement with almost universal current practice, all four books include material on the more important instrumental methods. Both PH&H and F&S are more successful in this area than P&F; the latter tends to include details in many of the figures that can only be confusing, as adequate description is lacking. H&K also could be improved with respect to drawings of apparatus, though the discussion is adequate.

None of these books could possibly be covered in one semester without major omissions. F&S includes much more material specifically directed to students interested in biomedical applications, such as discussions of the Technicon AutoAnalyzer and of enzymatic analysis, both of which are lacking in P&F and H&K. PH&H includes a good discussion of enzymatic analysis; their diagram of the AutoAnalyzer is rendered specious by lack of any discussion.

H&K is actually a laboratory manual, designed to be used in coordination with a standard text. It is keyed to PH&H, but could also be used to advantage with a book such as P&F in which laboratory instructions are scanty. The experiments in F&S can easily stand alone. H&K is accompanied by a teachers' manual entitled "Teaching Introductory Analytical Chemistry." This 123-page book is much more than a solutions manual; it contains much valuable material not readily available elsewhere, including description of the authors' experience and philosophy in such areas as the preparation and grading of unknowns, practical laboratory tests, and student evaluation.

Galen W. Ewing, *Seton Hall University*

Physical Chemistry of Nucleic Acids. By VICTOR A. BLOOMFIELD (University of Minnesota), DONALD M. CROTHERS (Yale University), and IGNACIO TINOCO, JR. (University of California, Berkeley). Harper & Row, Publishers, New York, N.Y. 1974. x + 517 pp. $25.00

After going through most of this book in some detail (motivated mainly by my interest in learning about the subject), I came away with a very favorable impression on two counts: (1) for most areas of nucleic acid chemistry that were covered and where developments up to about 1971 are concerned, it is quite thorough and complete; and (2) the discussion can be followed and understood with a minimum recourse to other reference material. These features should make it useful: (1) as a text to be used in graduate courses covering nucleic acid physical chemistry, and (2) for researchers using nucleic acids and in need for quick information on experimental facts and their evaluation.

On the negative side, there is one specific comment that I wish to make. The basic expression (Eq 2-1, p 33) for the transition probability induced by an incident light wave is, to say the least, cast in a rather unusual form. The sum over all electrons is carried out in the exponent of the phase factor, whereas the usual expression consists of a sum of phase factors, one for each electron. Granted that for the dipole approximations Eq 2-1 does yield the correct results; however, were this formula correct in general, it would negate the existence of any interference effects in radiation scattering and in addition would give incorrect results for higher order interactions.

I also did miss a more detailed discussion of nucleic acid annealing and hybridization experiments. This is unfortunate considering the importance of such experiments in many areas of great interest, in particular those involving the location of integrated viral genomes in host or target cell DNA.

In spite of these last two comments, I liked the book very much, learned a considerable amount from it (especially in the area of X-ray diffraction, colligative properties, and small ion binding), and consider it useful as a desk copy for workers in nucleic acid research.

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Advances in Inorganic Chemistry and Radiochemistry. Volume 16. Edited by H. J. EMELÉUS and A. G. SHARPE (Cambridge University). Academic Press, New York, N.Y. 1974. vii + 375 pp. $24.50.

The user of such a work as this volume of a well-known series might want a general review on a particular subject, with a compilation of references, or might want to extract a specific datum such as a bond length or the stability of a compound to hydrolysis. The problem here is that two of the six reviews appear to have escaped the editorial and proof-reading processes completely. These two, "The Chemistry of Bis(trifluoromethyl)amino Compounds", by Ang and Syn, and "Fluorosulfuric Acid, Its Salts, and Derivatives", by Jache, contain so many errors, particularly in symbols and chemical formulas, as to be downright dangerous. A few examples are: CoF_2 for CoF_3, $(CF_3)_3N$ for $(CH_3)_3N$, Nb for Rb, KSO_3 for KSO_3F, $SO_3F_2^-$ for SO_3F^-, 5°°00 for 500°, C_8 for C_s, C_2H_4NH for $C_2H_5NH_2$, CS for Cs, Sl for S, and *o*-substituted for O-substituted hydroxylamine. And while repetition has didactic value, it seems unnecessary to have Sections III C 1 and IV B 2 of Ang and Syn's review say exactly the same thing. Similarly, the editors seem to have been asleep at the switch in having peroxydisulfuryl difluoride discussed by Jache when it had been covered in detail in the preceding authoritative review, "Fluorinated Peroxides", by De Marco and Shreeve.

The contribution by De Marco and Shreeve is expert and well organized, as are the articles by DeKock and Lloyd on, "Vacuum Ultraviolet Photoelectron Spectroscopy of Inorganic Molecules", and by Seel on, "Lower Sulfur Fluorides". The review by Long, "The Reaction Chemistry of Diborane", is exhaustive. With 95 pages and 683 references, it is the longest review in the collection. It surveys more reactions of B_2H_6 than seem imaginable, including a startling discussion of the combustion in oxygen and air.

While mostly of excellent quality, this volume should be recalled by the manufacturer for replacement of some defective parts. Let us hope the publishers and editors take note and return this series to the high standards the chemical community has come to expect.

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