

especially like the emphasis on pre-laboratory preparation whereby students are directed to read certain text sections and to complete specific exercises *before* working on an experiment.

The menu of practical exercises includes many of the "old reliables" as well as several new ones; suggestions for additional work are provided in the form of "minilabs" and "experimental variations". Potentially attractive to students with biologically-related interests is the extensive use of natural products because, as Lehman states, "they often cost less, smell nicer, and are more pleasant to work with than purely synthetic analogs". Safety is treated thoroughly and conscientiously throughout the book. I do have reservations, however, about the pedagogical benefits to be gained from the synthesis of azo dyes or the use of toluene-2,4-diisocyanate for polyurethane synthesis in light of the chemical hazards involved. The sections in the text on spectral techniques are adequate but not as good as those found in *Introduction to Organic Laboratory Techniques* by Pavia *et al.* Nonetheless, in spite of these minor criticisms, the book is rather unique in its approach and one which is well worth considering for adoption. □

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Atkins anew

Maurice Rigby

Physical Chemistry, 2nd Edn. By P.W. Atkins. Pp.1,095. Hbk ISBN 0-19-855150-9; pbk ISBN 0-19-866151-7. (Oxford University Press/W.H. Freeman: 1982.) Hbk £25, \$29.95; pbk £10.95. *Physical Chemistry*. By J. Philip Bromberg. Pp.882. Hbk ISBN 0-205-06572-4; pbk ISBN 0-205-06867-7. (Allyn & Bacon: 1980.) Hbk \$27.95, £22.25; pbk £9.95.

IN THE past few years several candidates have presented themselves as potential successors to established and widely-used general textbooks of physical chemistry such as W.J. Moore's *Physical Chemistry* (Longmans/Prentice-Hall, 1972) and G.M. Barrow's *Physical Chemistry* (McGraw-Hill, 1979). One of the most successful has been that of P.W. Atkins, first published in 1978 and rapidly followed by a corrected reprint, which now appears in a second edition. The first edition of this work was notable for a generally well-judged level of coverage of most aspects of the subject, and for the fresh and accessible presentation of difficult concepts.

In the new edition these desirable qualities have been retained, and some

omissions and slight imbalances have been rectified. There is a completely new chapter dealing with macromolecules — a subject sadly neglected in the first edition — and many figures have been changed, with the introduction of computer graphics. In addition the treatment of chemical bonding, which was previously rather brief, has been amplified, and the introductory material on statistical mechanics has been simplified. Comparisons between corresponding sections of the two editions reveal numerous small changes, supporting the claim that all sections of the book have been reconsidered. My overall impression is of an excellent textbook which has become even better, and which seems sure to enjoy continued popularity in the future. Who, in any case, could resist a physical chemistry book which considers (p.103) the musical implications of a dying ocarina player?

Against such competition, yet another general textbook will have to be very good if it is to wean readers away from the established sources. J. Philip Bromberg has taken up this challenge, but has not completely persuaded me. The author claims to have aimed to present the subject at the mid-college level, and has consciously refrained from producing an encyclopaedia of physical chemistry. For this ambition he should be congratulated — at least one recent text has seemed to be aimed more at the readership of *Annual Reviews of Physical Chemistry* than at an undergraduate audience.

The book follows a fairly well-worn path from the gas laws through thermodynamics, statistical mechanics, quantum mechanics and reaction kinetics, giving quite formal and detailed coverage of the necessary theoretical development though not neglecting to draw attention to the practical relevance of the subject, where appropriate. It is liberally interspersed with short biographical sketches of notable scientists, which may help to give students some feeling for the development of the subject. The overall balance appears to emphasize thermodynamics and quantum mechanics, which are respectively developed classically and axiomatically. Electrochemistry and surface chemistry appear as applications of thermodynamics, and there is no mention of catalysis or of non-equilibrium aspects of electrochemistry. The treatment of reaction kinetics is short and repeatedly uses a rather laborious analogy with molecular effusion, the merits of which are not immediately apparent. In short, although the book has some attractive qualities, and I shall try to arrange for a copy to be available in our college library, I do not believe that it will replace its rivals in a majority of chemistry departments. □

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