clusion of environmental discussions is not extremely serious as many of the environmentally important molecules are mentioned and it would require a minimum of lecture time to discuss the significance of these molecules in environmental controversies if the instructor desires to do so. On the bioinorganic front the problem is much more serious. No mention is made of metalloproteins, porphyrins in complexes, and other biologically significant compounds. An instructor who wishes to include bioinorganic topics will have to supplement the text heavily. References to the bioinorganic literature are given at the end of most of the appropriate chapters.

Although there are no problems at the end of the individual chapters there are 305 problems, arranged roughly by chapter, with brief answers to each, at the end of the book. The text is very rigorous in its use of SI units moving beyond the current trend of quoting values in both SI and mks units. For a new text the book is relatively error free although minor typos do exist.

Considering both its strengths and weaknesses the book is a very significant contribution to the textbook literature of inorganic chemistry. The style is generally interesting and only rarely do the authors fall into the trap of making descriptive chemistry a series of listless one sentence paragraphs. The book is deserving of serious consideration as a text for a one semester or one year senior-graduate inorganic course.

William F. Coleman
The University of New Mexico
Albuquerque, 87131

Non-Aqueous Solvents. Studies in Modern Chemistry.

T. C. Waddington, University of Durham. Crane, Russak & Co., Inc., New York, 1975. 88 + pages. Figures and tables. 15 × 23 cm. $4.

This short paperback is intended to bridge for upper-level undergraduates or graduate students the gap between the treatment of non-aqueous solvents in the standard, general textbooks and in research papers. More specifically, the volume intends "to give the student a comparative view of the chemistry of non-aqueous solvents," both protic and aprotic. The author seems to realize these aims well. He is very familiar with his subject, having edited a comprehensive monograph on non-aqueous solvents in 1965. In accord with the indicated level, the author assumes a basic knowledge of the physical chemistry of ionic solutions and electrochemistry such as a student would obtain by completing courses up through one semester of physical chemistry.

Waddington introduces non-aqueous solvents by a general chapter on solvent-solute interactions in which he treats the nature of such interactions, the energetics of solvation, measures of solvent strength, solvent self-ionization, and the effect of solvent on certain types of reactions, e.g., salt formation or solvate formation. In five subsequent chapters he systematically treats the protic solvents, NH_3, HF, H_2SO_4, (water is included for comparative purposes), and many non-protic solvents. The latter are grouped under the chapter headings, liquid oxides (SO_2 and N_2O_4), oxyhalides (NOCl and $POCl_3$), liquid halides (AsX_3, $SbCl_3$, ICl, and BrF_3) and fused salts.

For each solvent taken up topics treated include: important physical properties, evidence for self-ionization, types of solutes, electrolytic behavior of solutions, and types of characteristic chemical reactions. Some reactions of organic compounds are also covered.

The author is able to achieve a great deal in few pages by good organization, use of extensive tables, careful selection of examples, and clear writing. The inclusion of two to six discussion problems at the end of each chapter reinforces the concepts that have been stressed. As is appropriate to this type of book, references are minimal and are generally to chapters in monographs. It should also be noted that the volume is virtually free of errors and attractively printed.

By stressing principles and utilizing good examples and illustrations it is believed the author has succeeded in overcoming what would otherwise be a significant limitation, the omission of any treatment of common organic solvents. It should be straightforward with the foundation he supplies to move on to such solvents. For the same reasons the fact that this volume appeared originally in 1969 (in Great Britain) saves it from being out-of-date.

"Non-Aqueous Solvents" is thus heartily recommended to the advanced undergraduate student who desires to acquaint himself with the subject and to practicing chemists whose research lies outside of non-aqueous solvents and who wish a survey of the field. The volume differs from the related 1962 paperback by Professor Harry P. Sisler, "Chemistry and Non-Aqueous Solvents," in its more physical approach and more careful organization.

Howard A. Strobel
Duke University
Durham, North Carolina 27706

Analytical Atomic Spectroscopy

William G. Schrenk, Kansas State University. Plenum Press, New York, 1975. xvii + 375 pages. Figures and tables. 16 × 23.5 cm. $32.50

This book, as the author states, is designed as a textbook and thus would probably not be of interest to the experienced worker in the field. It might be pointed out, however, that its use may not be limited to the class room. It would be good reading for a new graduate entering the field.

The book is well written and covers the field well. However, the older methods, i.e., quantitating by photographic film, is treated more extensively than new developments like lasers. Topics like interferences in the various areas are mentioned but not with completeness. It would seem that the book would benefit by the addition of more literature references. The index is *very* incomplete to the point that it is almost unusable.

The appendix contains much valuable information including spectral wavelengths and intensity tables and a very interesting and useful chart of an iron spectra with the wavelengths of many other elements marked for easy comparison.

All in all I believe this book is an excellent one for its stated purpose as a text and would be a good first choice for those faculty members teaching such a course.

Donald G. Davis
University of New Orleans
New Orleans, Louisiana 70122

The Dynamic Liquid State

A. F. M. Barton, Murdoch University, Western Australia. Longman, Inc., New York, 1975. vii + 159 pages. Figures and tables. 13.5 × 21.5 cm. $7.95

"The Dynamic Liquid State" by A. F. M. Barton attempts to introduce advanced undergraduate students to the chemistry and physics of the liquid state. In a brief monograph directed at students with a knowledge of basic physical science and mathematics (including calculus), the author discusses a large number of modern experimental and theoretical topics relevant to liquids. The stated goal is to provide an *appreciation* of recent research on pure liquids. While the book will probably achieve that aim, it is questionable whether it will furnish solid ground for *understanding* that research.

The book begins, after introductory remarks, by specifying the static and dynamic information which is used to characterize liquids: thermodynamic functions, linear transport coefficients, infrared and Raman spectra, X-ray and neutron scattering intensities, etc. This listing serves more or less as an outline for the rest of the text, which is primarily concerned with the interpretation of experimentally accessible parameters. Theoretical ideas are introduced as they are needed to describe experimental results; herein lies the book's major flaw. Organizing the book about experimental techniques sacrifices the systematic development of basic concepts related to the structure and dynamics of the liquid state.

It is admittedly a challenging task to establish the connection between microscopic and macroscopic properties of liquids at a level appropriate to undergraduate instruction. That connection depends on careful treatment of fundamental ideas such as distribution functions and averaging over statistical ensembles. Little attention is devoted to such details in "The Dynamic Liquid State;" both static and dynamic distribution functions are developed as theoretical constructs which allow physical scientists to interpret radiation scattering experiments. The pair correlation function is never clearly related to an ensemble-averaged Boltzmann factor, the relation of thermodynamic properties to the pair correlation function is never established, and efforts to calculate or approximate the pair correlation function are summarized in a few paragraphs. A chapter entitled "Theories of the Liquid State,"