

## BOOK REVIEWS

**Topics in Current Physics (founded by H. K. V. Lotsch) Vol. 6, 'Neutron Diffraction'**, Editor H. Dachs Published by *Springer-Verlag, Berlin, Heidelberg, New York*, 1978; 357 pages, 138 figures, 32 tables; Price DM 65

The series 'Topics in Current Physics' provides a systematic coverage of the progress in some advanced fields of the modern experimental Physics. Some examples are the Volume 4 (Electron Spectroscopy for Surface Analysis) and Volume 11 (Raman Spectroscopy of Gases and Liquids). Volume 6 presents some technical aspects of the neutron diffraction methods and their application for the solution of physical and chemical problems. The neutron diffraction techniques are presently indicated as integrative to X-ray diffraction investigations, but they have also found wide importance in solid-state magnetism and in structural researches on synthetic polymers and biopolymers.

This book presents an up-to-date review of the applications in these and other fields. It is divided into the chapters:

1. Principles of Neutron Diffraction (H. Dachs);
2. Polarized Neutrons (J. B. Hayter);
3. Combining X-Ray and Neutron Diffraction: The Study of Charge Density Distributions in Solids (P. Coppens);
4. The Determination of Magnetic Structures (W. Prandl);
5. Disordered Structures (W. Schmatz);
6. Phase Transitions and Critical Phenomena (P. A. Lindgård);
7. Application of Neutron Diffraction to Biological Problems (G. Zaccai);
8. Liquid Structure Investigation by Neutron Scattering (P. Chieux);
9. Dynamical Neutron Diffraction and Its Application (H. Rauch and D. Petrascheck).

These chapters appear to be well prepared and present at the end a very extensive literature. A final subject index is inserted, but no Authors Index.

The text is clearly and accurately written and presented. Literature closing date: 1977.

This seems a very useful book, also as a source of possible new ideas for application of the technique to current structural problems in Chemistry and Physics.

The reviewer agrees with the Editor in considering the book as an help to researchers who are engaged

in neutron diffraction and students beginning their research work in this field.

Roberto Zannetti

### **Inorganic Reactions in Liquid Ammonia**

Dr. DAVID NICHOLLS

*Elsevier*

In this monograph of 238 pages, Dr. Nicholls has put together a very interesting account of the chemistry of reactions that occur in liquid ammonia. In all there are eight substantive chapters, the first being a relatively short but broad introduction to the types of reaction that can occur. Chapter 2 gives information about the physical properties of liquid ammonia and its solutions, and this includes a useful up-to-date summary of solubilities.

For anyone who wishes to use liquid ammonia for serious preparative work, chapter 3 will be most useful, and here, as with all the chapters, there is a full set of references. The remaining five chapters deal with various types of reaction.

In chapter 4 the reaction of elements and their compounds is covered extensively; this is a very important section since reactions using liquid ammonia can be complicated by reactions with the solvent itself – e.g. ammonolysis.

Chapters 5 and 6 deal with acid–base and oxidation–reduction reactions respectively, in a logical order, and chapter 7 extends the reduction discussion with a review of the reactions possible using solutions of alkali metals in ammonia. Such alkali metal solutions are very powerful reducing agents and their full potential is not always realised by practising inorganic chemists. Nicholls' book will go a long way to up-dating people in this respect.

The final chapter is concerned with synthetic reactions involving metathesis or substitution, and once again it brings together a range of topics that is not otherwise readily available. It includes such areas as cyanides, carbonyl derivatives, hydrides and a variety of organometallic compounds.

This book is somewhat unusual in that it does not just include the very latest piece of research, but gives a balanced view and includes much of the earlier work now so sadly neglected. It is not a book for the reader who merely wants physico-chemical theories and no facts, but a book for the connoisseur chemist who is really interested in what compounds are like