

The physics of ferroelectric and antiferroelectric liquid crystals. By I. Musevic, R. Blinc & B. Zeks. Singapore: World Scientific, 2000. Pp. 680. USD 129, GBP 88. ISBN 981-02-0325-X

Liquid crystals are the only known fluid systems that exhibit ferroelectric and antiferroelectric properties, and so occupy a special place in physics and technology. Their unique electro-optic properties were first observed around 20 years ago and the potential gains for the electronic displays industry were immediately apparent. The subject has since developed rapidly, proving to be one of the most exciting and dynamic areas in liquid-crystal research. This book aims to give a detailed account of all aspects of the world-wide research that has been focussed on these materials since their discovery.

The structure of the book is extremely logical and has been well thought out. From initial chapters on the symmetry and structural requirements of ferroelectric and antiferroelectric liquid crystals, the reader is naturally led through the important experimental and theoretical discoveries in optic, electro-optic and structural studies. Unfortunately the preface makes the book sound

book reviews

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slightly limited, stating 'The book presents mainly the results of work that has been done by us and our colleagues from the J. Stefan Institute at the University of Ljubljana'; this really sells it somewhat short. All of the chapters are well referenced with the important contributions to the subject from numerous research groups around the world.

The real strength of the book is in the clear and concise explanations the authors give of many aspects of underlying theory and the implications of various experimental results. Many of the discussions of conflicting data and ideas are also presented in an unbiased way. This makes the book eminently readable, not only as a resource for advanced researchers in the area, but also as a first introduction for new graduate students. The only minor drawback is perhaps the small amount of chemistry that has been included. Of course, the remit of the book is the physics of antiferroelectric and ferroelectric materials, but the properties of these systems are intimately linked to their molecular structure. Also, it would have been useful to include a brief comparison of the properties of some of the widely used materials. This would have made an excellent addition to the other appendices,

which certainly represent a useful source of information on experimental techniques. The book was undoubtedly up to date at the time of publication, and although some aspects (such as studies into the structure of intermediate phases) have moved on in just the past two years, the nature of the references should still give any reader easy access to the names of the prominent researchers in a particular area.

This is an essential reference work and should occupy a place on all liquid-crystal bookcases. The clear presentation of a variety of theoretical and experimental techniques can only improve any reader's knowledge of this subject. Hopefully this book will prove to be a well used reference for ferroelectric and antiferroelectric research in the foreseeable future.

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