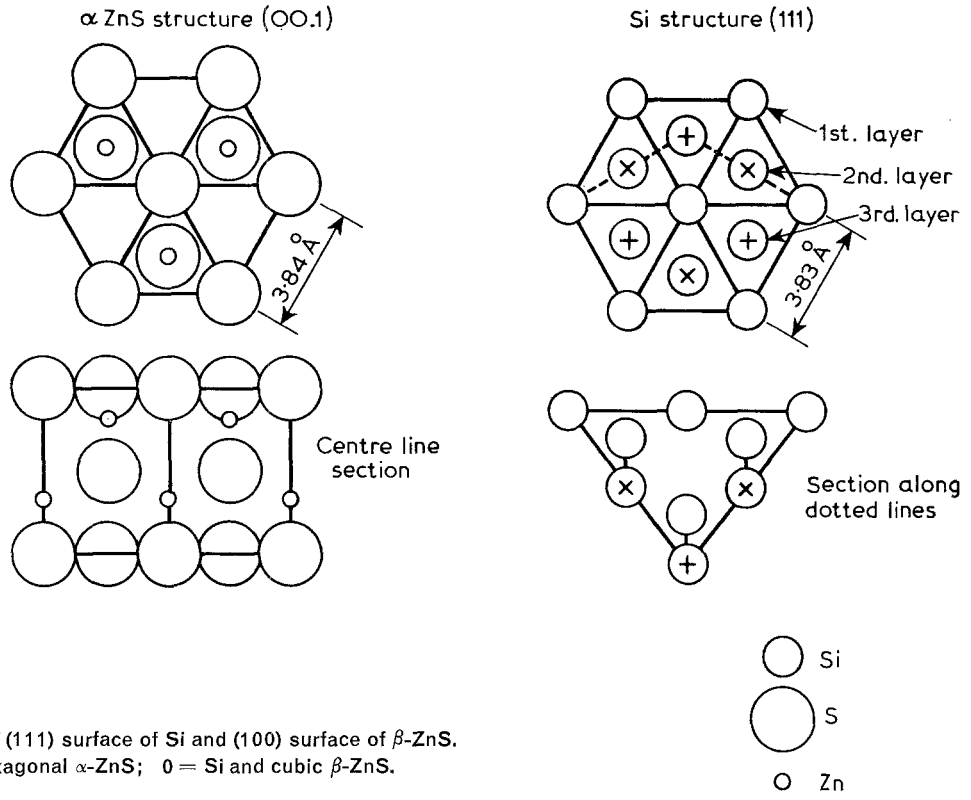

Figure 5 (111) surface of Si and (100) surface of β-ZnS. o = hexagonal α-ZnS; 0 = Si and cubic β-ZnS.

α, leaving the α-nuclei as flat discs. Such discs would have the appearance of defects of type B and give rise to the extra reflections noted on the diffraction pattern.

(*iii*) *Defects of Type C* These are dislocations showing dot contrast. In view of the method of preparation they are probably screw dislocations growing in the deposited layer and ending on the interface. There are many more of them than there were in the original silicon, so they cannot be extensions of dislocations present in the substrate.

References

1. P. JONES, C. N. W. LITTING, D. E. MASON and V. A. WILLIAMS, *Brit. J. Appl. Phys.* **1**(2) (1968) 283.
2. H. JAGODINSKI, *Acta. Cryst.* **2** (1949) 298.

26 August 1968

P. WILKES
Department of Metallurgy
Faculty of Science, The University
Manchester, UK

Book Reviews

Solid-State Chemistry

N. B. Hannay

Paperback, pp xi + 225 (Prentice-Hall, 1967) £2

In an age when the veracity of the aphorism "Of the making of many books there is no end . . ." is persistently demonstrated, it is refreshing to review one which has not only been written for the right reasons, but has, also, much else to commend it. As Dr Hannay himself emphasises, there is at present feverish research activity in the general field of solid-state chemistry, yet many of the teaching programmes in Departments of Chemistry in British and American Universities still tend to ignore this well-defined branch of the subject. It is an encouraging sign that this book is the first in a series devoted to fundamental topics in physical chemistry. Many zealous materials scientists, and their more immediate progenitors,

will welcome the appearance of a text which succinctly describes for them, and particularly for chemists, the right and proper scope of solid-state chemistry.

After reading this book no chemist should ever again express surprise on being told of the synonymity of the Fermi level and the chemical potential of electrons, and no longer should he plead ignorance when confronted with such terms as "excitons", "phonons", "heterogeneous nucleation", and a host of others which have still not found their way into the vast majority of standard chemical texts.

There are eleven chapters, the first two of which deal with the nature and electronic structure of solids. Much of what is written here is familiar to those readers acquainted with the author's introductory chapter to the American Chemical Society's monograph on Semiconductors, edited by him. Then follow chapters of approximately equal length on: imperfections in solids; imperfections and physical properties, in which electrical, optical, magnetic, thermal and mechanical consequences are summarised; imperfection equilibria, where the electron in insulators and semiconductors is treated as a chemical entity; atom movements; defect interactions; structural transformation; chemical reactions; and surfaces. The last chapter deals with crystal growth and purification, and it concludes, like all others, with a selection of imaginative and provocative problems.

This book is extremely well conceived and expertly written, the exposition being, in parts, beautifully pellucid (e.g. the treatment of the kinetics and energetics of structural transformations, pp. 143-146). But despite the wealth of topics discussed in such a short space, one feels that there are, nevertheless, a few errors of omission. Organic solids are hardly mentioned, which is a pity, bearing in mind the increasing importance of solid-state polymerisation and the electrical properties of biologically significant compounds. Moreover, no reference is made in the suggestions for further reading (pp. 214-215) to the recent series of books on the chemistry and physics of organic solids edited by Labes, Weissberger, and Fox. Two other books which ought to be cited are A. L. G. Rees' classic on the Defect Solid State and Hedvall's recent monograph. Other noticeable omissions are topochemical reactions and topotaxy. A more recent account of the present situation regarding factors that influence catalytic activity could have been given. On a more fastidious level, it ought to be mentioned that dislocations are described (extremely well) without mention of the Burgers vector, and that figure 2.10 lacks chiaroscuro.

For twopence a page, this book is excellent value for money.

J. M. THOMAS

Superconducting Magnets

P. F. Chester

Reports Progr. Phys. **30** (2) (1967)

Published as a separate pamphlet by the Institute of Physics, 47 Belgrave Square, London, SW1, UK

This represents a useful and informative study of the basic technological problems facing the designer of superconducting magnets, and reviews recent developments in the stabilisation of such magnets, which have been able to eliminate the problems of "training" and degradation inherent in the materials used in early superconducting magnets. The use of stabilised composite materials, consisting of a superconducting component in good electrical and thermal contact with a normal component of high electrical and thermal conductivity, has led to the routine use of superconducting magnets, free from the temperamentality associated with the preceding generation. However, the possibility still does exist of some kind of failure or accident, unconnected with the magnet itself, leading to the dissipation of the high energy stored in the magnet, and the report discusses such problems in depth. The point is clearly made that the advent of stabilised composites removes the obstacle to the construction of superconducting magnets of any size from the realm of superconducting materials to that of the strength of available materials. Clearly, superconducting magnets are now an established aspect of modern technology.

A. D. C. GRASSIE