

conventional semiconductor physics. It starts from a very elementary level and only gets as far as *p-n* junctions, surfaces and MIS structures in the last two of the 15 chapters. Physical concepts are badly explained, the relevance of the material to solid-state electronics, in the few places where there is any, is not brought out. There are two pages on tunnelling through potential barriers but there is no mention of tunnel diodes, Esaki or superlattices, for example. Much unnecessary material is included and there are a number of careless mistakes. A few examples illustrating these points are as follows.

The first sentence gives the wrong year for the discovery of the transistor. The third and fourth figures in the book are interchanged. Semiconductors are only reached in chapter 8 (out of 15) and yet seven pages are devoted to explaining and tabulating the electron states of all the elements of the Periodic Table. This section also contains the statement that the atomic numbers of the inert gases are given by $Z = 2 \sum n_i^2$ where $n_i = 1, 2, 3, \dots$ (equation 5.9.1, p. 79). This is wrong from $n_i = 3$ onwards. Expressions for wave functions are consistently referred to as wave equations which will irritate good students and baffle weak ones. Chapter 14 on the *p-n* junction is taken uncritically from a 1949 paper by Shockley with the result that (a) the energy band diagrams are upside down by modern convention, *i.e.* the valence band is at the top and the conduction band at the bottom and (b) the depletion region as it is now known is referred to throughout as the transition region. To Shockley's algebra and diagrams the author has added his own mistakes. Figure 14.1.1.(c) is identical to 14.1.1.(b) and does not show the quasi-Fermi levels mentioned in the caption and the text and shown in Shockley's original figure. The quality of the explanations of physical ideas is shown by the second paragraph of this chapter which ends as follows 'The rectifying process occurs in the transition region. Appreciable hole currents may flow into the *n*-type region beyond the transition region. Therefore, the rectifying process is not limited to the transition region. The volume of a semiconductor specimen within which the rectifying process occurs is generally termed the junction and includes the transition region and beyond.' Comment: The whole passage is unnecessary and confusing. Sentence 1 of this passage is wrong and contradicted by sentences 3 and 4. Sentence 2 is less than half the story. The electrons will be injected into the *p*-type material also in forward bias while neither type of carrier is injected under reverse bias. Sentence 4 is excessively vague and pointless.

Conclusions: This is not the book of the title and cannot be recommended to students. It is a pity that the author, who has on the whole handled the mathematics well, did not put an equally successful effort into checking facts, explaining ideas and relating the work to solid-state electronics.

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Books Received

The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

Сегнетоэлектрические пленки сложных окислов металлов, Ю. Я. Томашпольский, Г. Л. Платонов. Стр 200. Москва «Металлургия» 1978. (*Ferroelectric films of metallic complex oxides*. By YU. YA. TOMASHPOLSKY and G. L. PLATONOV. Pp. 200. Moscow: Soviet Metallurgy, 1978). Price 1p 70k. A review of this book, by A. M. Glazer, has been published in the December 1980 issue of *Journal of Applied Crystallography*, page 636.

Handbook of semiconductors. Vol. 2. Optical properties of solids. Edited by M. BALKANSKI. Pp. xiv + 633. Amsterdam, New York, Oxford: North Holland Publishing Company, 1980. Price US\$122.00, Dfl 250.00. A review of this book, by M. A. G. Halliwell, has been published in the December 1980 issue of *Journal of Applied Crystallography*, pages 637–638.

Theory and practice of direct methods in crystallography. Edited by M. F. C. LADD and R. A. PALMER. Pp. xiv + 421. New York and London: Plenum Press, 1980. Price US\$35.00. A review of this book, by Peter S. White, has been published in the November 1980 issue of *Acta Crystallographica*, Section B, page 2860.

Handbook on the physics and chemistry of rare earths. Vol. 2. Alloys and intermetallics. Edited by K. A. GSCHNEIDNER and L. EYRING. Pp. xiv + 620. Amsterdam: North-Holland, 1979. Price US\$97.50, Dfl 200.00. A review of this book, by D. G. Lord, has been published in the October 1980 issue of *Acta Crystallographica*, Section B, page 2512.

Handbook of liquid crystals. By H. KELKER and R. HATZ. Pp. xviii + 917. Weinheim: Verlag Chemie, 1980. Price DM 420.00. A review of this book, by G. W. Gray, has been published in the November 1980 issue of *Acta Crystallographica*, Section B, page 2861.