BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Neutron Transmutation Doping of Semiconductor Materials

Editor Robert D. Larrabee

Publisher Plenum Press, New York (1984)

Pages 336

Price $75.00

Reviewer Kaj Heydorn

Neutron transmutation doping has come of age with the completion of four international conferences exclusively devoted to this particular technique of semiconductor production. The present book contains the proceedings of the fourth and last conference, held at the U.S. National Bureau of Standards in Gaithersburg, Maryland, June 1-3, 1982.

The unsurpassed uniformity of doping that can be achieved with this method has led to a commercial development from a few kilograms in 1974 to ~50 tons in 1984. The original use of the material for high-voltage direct current thyristors is now supplemented with power transistors and diodes, but not with IC applications.

This volume contains papers on the processing and characterization of neutron-transmutation-doped silicon and the use of the material in semiconductor power devices. In addition there are papers on irradiation technology from the major suppliers of neutrons and on the transmutation doping of other semiconducting materials. Although the book contains 24 valuable and interesting contributions, the long publication time severely detracts from their value. These proceedings of the fourth conference were not yet available when the participants gathered again for the fifth time in February 1984 in conjunction with the American Society for Testing and Materials Symposium on Semiconductor Processing. Proceedings of this latter symposium are already out; they include ten papers on neutron transmutation doping and, together with the present volume, represent the state of the art of the field. Future papers on neutron transmutation doping are likely to be found in the context of semiconducting materials in general.

Kaj Heydorn has been involved in the neutron transmutation doping of silicon since its inception and, in cooperation with the Danish company Topsil, pioneered its commercial introduction. His main interests include analytical quality control, and he has been appointed general chairman of the 7th International Conference on Modern Trends in Activation Analysis, which is to be held in Copenhagen in 1986.

Principles of Radiation Shielding

Authors A. B. Chilton, J. K. Shultis, and R. E. Faw

Publisher Prentice Hall, Inc., Englewood Cliffs, New Jersey (1984)

Pages 488

Price $39.95

Reviewer G. Hehn

This hardbound book with its attractive layout is intended as a beginner's text for the discipline of radiation shielding. Radiation protection and shielding help to optimize the use of nuclear radiation in numerous applications ranging from reactor technology to the medical use of ionizing radiation, which are the most important fields. In the preface of the book, the authors state that the fundamentals of radiation shielding can be treated in a general way without any restriction to a specific field of application. This concept is then followed convincingly throughout the text. The presentation of the fundamental quantities is short, didactically elegant, and consistent with internationally agreed upon definitions and units. The mathematics required for the various approximating techniques in shielding is covered well. The mathematical functions as well as the integral shielding data can best be stored and handled by microcomputers.

To reduce conservatism and overdesign in shielding, which is of high importance to the economy and future of nuclear technology, we have to apply more sophisticated transport methods with the help of macrocomputers. About