

the book will be useful to those working with the development and production of semiconductors.

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**Vapour growth and epitaxy.** Edited by G. W. Cullen, E. Kaldis, R. L. Parker and C. J. M. Rooymans. Pp. xii + 398. North Holland, 1975. Price Dfl 185.00, US \$ 73.95.

Epitaxy has seen a rapid growth in the past decade. The success of epitaxial silicon layers in overcoming some of the shortcomings of silicon planar technology in the middle sixties has now led to the striking success of integrated circuit technology. This is vapour phase technology and it has been applied with success to some of the more important III-V compounds. Here, however, the rival technique of liquid-phase epitaxy (LPE) using a molten metal as the nutrient medium has proved perhaps more successful. Now a new technique has already appeared, and it is rapidly approaching commercial application – this is molecular beam epitaxy (MBE). It is quite unlike chemical vapour deposition (CVD) or LPE. It relies on molecular beams from shuttered ovens in a very high vacuum and is capable of giving high purity and monolayer control to the growing crystal on its substrate. It opens the window on a future where tailoring devices on almost an atomic scale will be possible.

The third International Conference on Vapour Growth and Epitaxy was held in

Amsterdam in August 1975 and this well produced volume is the proceedings. It is a reprint of Volume 31 of the *Journal of Crystal Growth*. The previous conferences were Zürich 1970 and Jerusalem 1972; the venue for the fourth conference has yet to be announced.

As might be predicted, vapour-phase growth and study of defects in layers of silicon, GaAs, GaP and III-V alloys figure prominently. Molecular-beam epitaxy is discussed in only two articles. Liquid-phase epitaxy of III-V compounds and alloys is well covered.

There are 54 contributions in all. Some of these were presumably invited papers but there is no indication of this. Perhaps four editors is a case of 'too many cooks spoil the broth'! Of the longer contributions we might take note of a comparison of theory and experiment by Bennema and van Leeuwen, the fundamentals of VLS growth by Givargizov and Hartman's vapour-phase epitaxy of II-VI compounds.

Among other topics given good coverage are the liquid-phase epitaxy of magnetic garnets, and the solar cell problem. Topics with few contributions include metals and metal films and nitride films.

The volume suffers from the usual faults of a conference proceedings – the quality and coverage of topics depends on the participants who came. Many articles are of a transitory value, being the passing thoughts and recent results of contributors who do not give much background and who have already taken things a stage further.

Those actively concerned will certainly wish to read this book, at least in part.

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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.*

**Crystal growth and characterization. (Proceedings of the Second International Spring School on Crystal Growth, Japan, 1974.)** Edited by R. Ueda and J. B. Mullin. Pp. vii + 419. North-Holland/American Elsevier, 1975. Price \$33.95.

A review of this book by B. Pamplin has been published in the January 1977 issue of *Acta Crystallographica*, Section A, page 254.

**Developments in electron microscopy and analysis.** Edited by J. A. Venables. Pp. xxviii + 537. London: Academic Press, 1976. Price £11.50, US \$29.00.

This substantial book contains the proceedings of 'EMAG-75', the conference of the Electron Microscopy and Analysis Group of the British Institute of Physics, held at Bristol in September 1975.

Although only a national conference, the scope, quality and number of the papers (about 120 in all) is remarkable. The bulk of these papers deal with electron microscopy instrumentation, techniques and analytical applications. However, there is a great deal of crystallographic interest, especially, for example, high-resolution images of lattices, diffuse scattering from crystals and zone axis patterns ('zaps') and the study of crystal defects and grain boundary structures. There is a good index and a useful ten-page introduction.