A. Prince, 1956, Inst. Met., Monogr. No. 2, pp 230–324) was published in 1956, no bibliography of references since 1955 on multicomponent alloy constitution has been available. The present work includes over 18 000 references from 1956 to December 1973 and also all the 1955 references not included in the previous compilation. References are given for alloy systems, systems containing metalloids, sulphide systems and oxide systems where equilibrium with a metal is dealt with. References to crystal structure determinations, the inorganic synthesis of ternary compounds and property–composition relations that provide constitutional data have been included in addition to those on phase equilibria. Binary alloy systems are not included since these are fully referenced in *The Constitution of Binary Alloys* (M. Hansen & P. Anderko, 1958, McGraw-Hill. First Suppl., R. P. Elliott 1965; Second Suppl., F. A. Shunk 1969), nor are references to equilibria between oxides since these are surveyed in *Phase Diagrams for Ceramicists* (E. M. Levin, C. R. Robbins & H. F. McMurdie, 1964, The American Ceramic Society. First Suppl. 1969; Second Suppl. 1975).

References to ternary systems occupy 88% of the total, quaternary systems 10% and quinary, senary, septenary and octonary systems the remaining 2%. Within each system the references are grouped in the alphabetical order of the chemical symbols for the components – a simple arrangement which obviates the need for an index to the systems included in the bibliography.

In compiling the bibliography the author has used two abstract journals – Chemical Abstracts published by the American Chemical Society and Metallurgical Abstracts, published initially by the Institution of Metallurgists and latterly as Metals Abstracts published jointly by the Metals Society and the American Society for Metals.

This bibliography is without doubt a standard work of reference which will form a necessary part of any scientific or technological library. It not only reflects on the great industry of its author but also his judgement in the selection of the references – a judgement which has been acquired as a result of his extensive knowledge and interest in the field of heterogeneous phase equilibria.

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Heteroepitaxial semiconductors for electronic devices.

Edited by *G. W. Cullen* and *C. C. Wang* (with contributions by V. S. Ban, S. Berkman, J. Blanc, G. W. Cullen, M. T. Duffy, N. Goldsmith, W. E. Ham, C. C. Wang and P. J. Zanzucchi). Pp. VIII + 299. Berlin-Heidelberg-New York: Springer, 1978. Price DM 158.00, US $ 79.00.

The intention of the authors of this book is to describe in some detail the preparation and characterization of heteroepitaxic thin films, mainly of silicon, but also of III–V and II–VI semiconductor compounds on sapphire and spinel substrates. A further intention is to demonstrate the intimate correlation between the particular properties of these epitaxic films and the technologies applicable to them in order to develop successfully electronic and optical devices. The most important film materials and their applications are Si for integrated MOS devices, GaP for LED's, GaAs for photocathodes, ZnO for electrooptic thin-film modulators, and AlN for surface acoustic wave (SAW) devices. In addition, this book contains broad information on epitaxic layers of other materials on sapphire and spinel.

After a brief introduction, Cullen gives a very comprehensive chapter of 100 pages on Si layers. The growth and surface preparation of the substrates and their reactions with epitaxic gases are discussed in detail.

In chapter 3, Wang presents the compound semiconductor layers. Numerous binary and even ternary III–V compounds are considered and the particular advantage of organometallic materials is pointed out.

In chapter 4, special films for SAW and electrooptical devices are discussed.

Chapter 5 treats the methods for characterizing film thickness, evenness, crystallinity, impurity content and properties of passivation layers.

A detailed chapter (6) of 50 pages is that by Ham on the electrical characterization of the films.

Gas flow dynamics are treated in chapter 7, and the last chapter is a study on misfit, strain and dislocations which, in addition to SOS, also discusses Si/Si and Si/Ge epitaxy.

The authors show up limiting factors in this field of technology, but they also point to chances of further developments. The title does not reveal that this book is really a detailed standard work on silicon-on-sapphire and related epitaxic material problems. It will be helpful for those working in this field or planning to do so, and for those looking for the properties of silicon or other semiconductors on transparent isolating substrates for new device applications or for their possible introduction into their production lines.

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Developments in electron microscopy and analysis 1977.

Edited by *D. L. Misell*. Proceedings of the Institute of Physics Electron Microscopy and Analysis Group Conference held in Glasgow, 12–14 September 1977 (EMAG 77). Conference Series No. 36. pp. xiii + 441. Bristol and London: The Institute of Physics, 1977. Price £11.00, $21.00.

An interesting question which arises prior to attending a Conference or reading the Proceedings of an Electron Microscopy Conference is how much time will be spent on instrument development – the search for the ultimate, how much time will be spent justifying relatively new techniques such as STEM and FIM and how much time will be devoted to the user, be he industrial or academic, who uses electron microscopy as a tool. Unfortunately EMAG 77 spent far too much time on the first two rather than the last mentioned. I say 'unfortunately' since it is, at the end of the day, the user who sustains the former interests and doesn't let the instrument die a natural death through non-use. Although the ideal in accelerating voltage or electron-beam source is of interest, most users or potential users are interested in an instrument which is adequate for the job without being phenomenally expensive. Cosslett states the same in his initial assessment of the state of the art by pointing out that the lagging of the acceptance of STEM in metallurgy and mineralogy is because of a lack of 'hard' results of which there is a vast quantity from traditional instruments.

The dynamic recording of events is useful since these often occur far too rapidly for complete visual detection and, consequently, appreciation. The eye very often misses the essential features. The