Book Review

Materials for Advanced Batteries
Edited by D. W. Murphy, J. Broadhead and B. C. Steele, Plenum Press, New York and London, 1980, 373 pp., Price $39.50.

Development of different modern versions of batteries involves the use of new kinds of materials for electrodes and electrolyte. Some of these materials, such as salt melts, alkali metals as anodes, etc., have long been known, but as yet their use in batteries presents great difficulties, which shows that not all their physico-chemical and electrochemical properties are sufficiently well understood. Other materials — solid, fast ionic conduction electrolytes, intercalation compounds, etc. — were discovered comparatively recently, and in spite of intensive studies, many of their properties are not completely clear.

The investigation and practical use of these new materials for batteries were the subjects of discussion at a special symposium held in France in 1979. The proceedings of this symposium are published in the book under review. It contains plenary review papers and also communications on some particular problems. In addition, for many of the problems discussed at the symposium, reports on the present state of the art are given, written by special study groups consisting of experts in each particular area.

The review papers on intercalation compounds (M. B. Armand) and on solid electrolytes (R. A. Huggins) treat various aspects of these important problems quite adequately. S. B. Brummer *et al.*'s report presents a comprehensive review of all the problems involved in the reversible operation of lithium electrodes in organic electrolytes. These problems are also considered in the communication of the late I. Epelboin *et al.* D. R. Vissers' report discusses in detail the present state of lithium–aluminium/iron sulfide batteries in which salt melts are used as electrolyte.

Besides the properties of new materials and their use, the book deals with some other important problems. In his review, E. J. Casey, with good reason, considers the problem of the purity of the water used in batteries and in electrochemical studies. Ever increasing attention is now being given to various interface phenomena, the wetting processes in particular. This problem is dealt with not only in F. G. Will's review but also in the report of one of the study groups.

On the whole it can be said that the book covers a number of key problems encountered by investigators developing new types of batteries and

studying processes occurring in them. Although three years have passed since the symposium and many new studies have been carried out, most of the information contained in the book is of vital importance today.

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