

BOOK REVIEW

Electrochemistry at Semiconductor and Oxidized Metal Electrodes. S. ROY MORRISON, Plenum, New York, 1980. 401 pp. \$45.00.

Much of classical electrochemistry has been concerned with metal/electrolyte interactions as evidenced by the wide use of mercury and platinum as electrode materials. However, many of the important problems concerned with the metal/electrolyte interface really involve the interface between a semiconductor and an electrolyte. For example, the phenomenon of passivity is dependent on a thin oxide film on the surface of the metal and the corrosion of zinc in neutral halide solutions occurs through a thin oxide or hydrated oxide. Present efforts to develop new energy conversion devices have focused attention on the interface between a semiconductor and an electrolyte. New ways of visualizing this semiconductor/electrolyte interface have been developed and are being developed. Morrison has set the objective to provide a basic description of electrode reactions on nonmetallic electrodes and oxidized metal electrodes. He has succeeded.

The book includes the development of the fluctuating energy model of Marcus and Gerischer (3 chapters), a description of elementary electrochemical measurement techniques, the conduction and valence bands of the nonmetals and the energy relationship to electrolyte constituents, the utility of models to describe mathematically reactions at the electrode surface, and important applications of the technology to solar energy conver-

sion, photovoltaic cells, electrocatalysis, and electropolishing of semiconductors.

The book should be considered as an elementary text to introduce electrochemists to solid-state principles and to introduce solid-state physicists to electrochemistry. It represents an excellent jumping off place for one whose interests are in bridging the gap between solid-state science and electrochemistry and for one who needs background before tackling the original and current literature. There are extensive references to each chapter and there is a list of 77 review articles and books which may be consulted for elaboration on special subjects. There is an author index and a very good subject index. The author index, along with the text, reveals the major influence on the field by such workers as A. J. Bard, R. Cardon, H. Gerischer, W. P. Gomes, R. Memming, and the author, S. R. Morrison.

One is struck by the very large amount of practical information furnished, most of which can be located readily by consulting the subject index. It is a treasure house for a reader who has a technical problem in semiconductor electrochemistry but who has not yet framed the question precisely.

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