

their halides and of cadmium and its halides. As the title of the chapter indicates, there is little information on the metal-rich end of the phase diagram, and the solubilities of metals appear to be confined almost entirely to their own rather than foreign salts. Evidence from various systems is reviewed for the basic models of the solution process—the formation of subhalides or the solution as metal ions and electrons (the electrons being either “free,” transferred to energy bands of the salt as a whole, or distributed over a number of neighboring cations). The author does not make the distinction here which other authors have made between “metallic” and “nonmetallic” solutions, based on the effect of dissolution of metal on the electrical conductivity of the solution.

Very little work has been done in the field of “Reaction Kinetics in Fused Salts” (*i.e.*, reaction kinetics in solution as distinct from electrode kinetics), aside from that of F. R. Duke (and his co-workers), who has contributed the final chapter. The author discusses the acid-base properties of the nitril ion relative to pyrosulfate and dichromate ion, the decomposition of bromate, catalysis by heavy-metal ions, and the chlorate-iodide-iodate-chloride reaction, all in molten alkali nitrates.

The book as a whole succeeds in its aim of giving a good idea of the level of understanding in the field. However, although the editor's preface states that the authors were encouraged to evaluate and comment on the pertinent literature, there are few definitive critical analyses in the book. Since chapters for a book such as this must have been completed at different times, the literature surveys do not all cover the same period. Although many references to 1962 and 1963 work are given, much of the literature beyond 1961 is not covered. For the beginner in the field, a more uniform treatment of experimental methods, perhaps as a separate additional chapter, and a single chapter on theories

of fused salts, to reduce the duplication in several chapters, might have been useful. This is a book which beginners in the field can read with profit and which old-timers will need to refer to.

DEPARTMENT OF CHEMISTRY  
UNIVERSITY OF MAINE  
ORONO, MAINE

JERRY BRAUNSTEIN

---

## BOOKS RECEIVED

March 1965

- BRIAN G. WYBOURNE. “Spectroscopic Properties of Rare Earths.” John Wiley and Sons, Inc., 605 Third Ave., New York, N. Y. 1965. viii + 236 pp. \$10.50.
- C. J. BALLHAUSEN and H. B. GRAY. “Molecular Orbital Theory.” W. A. Benjamin, Inc., 1 Park Ave., New York, N. Y. 10016. 1965. ix + 273 pp. Clothbound, \$9; paperbound, \$4.95.
- R. M. GOULD, Editor. “Fuel Cell Systems.” Advances in Chemistry Series, No. 47. American Chemical Society, 1155 Sixteenth St., N.W., Washington, D. C. 20036. 1965. viii + 360 pp. \$8.
- T. MARTIN LOWRY. “Optical Rotatory Power.” Dover Publications, 180 Varick St., New York 14, N. Y. 1965. xiii + 483 pp. \$2.75.
- ROBERT H. BROUT. “Phase Transitions.” W. A. Benjamin, Inc., 1 Park Ave., New York, N. Y. 10016. 1965. xiii + 202 pp. \$9.