

essential practical details. Very full descriptions are given of the electrolytic separation and quantitative estimation of silver, copper, bismuth, antimony, cadmium, nickel, cobalt, and zinc from solutions also containing other metals likely to be associated with them. The methods described in the earlier chapters are applied to the electrolytic analysis of several industrial alloys, including yellow metal alloys, white metal alloys, nickel bronzes, light aluminum alloys, and fusible metals. Internal analysis is dealt with in a very thorough manner, both from the theoretical and from the practical point of view. The methods of Pregl and of Sand and Lindsay for microchemical analysis are fully explained and illustrated by a description of a quantitative separation of lead and bismuth. Electrolytic Marsh tests of arsenic, antimony, and germanium are described in detail.

This book is a very useful and valuable one. It is well arranged and written and the descriptions are both clear and ample, so that a student following them could carry out any of the estimations described. The text is well illustrated, and a number of relevant references are included in it. The book may be unreservedly recommended to analysts and to chemists generally.

JAMES F. SPENCER.

Principles of Inorganic and Analytical Chemistry. By E. J. BALDWIN. 506 pp. New York: D. Van Nostrand Company, 1940. Price: \$3.25.

The book is divided in two parts, part I (204 pages) dealing with properties of atoms and molecules, and part II with the theory of reactions. The book is well written in a lucid style. "The author has intended to include in it the main features of the various theories of inorganic chemistry, together with their application to the reactions commonly used in analysis."

The book is intended for class-room study during the entire second year of chemistry. The reviewer doubts whether it will be a success in this respect. The book is not balanced, in so far as it gives a too detailed discussion of parts of physical chemistry and lacks a presentation of the application of many of the essentials to analysis. For example, an extensive discussion of covalence is given in part I, but the use of organic compounds in qualitative and quantitative analysis is not mentioned. Reaction velocity is discussed in the first chapter of part II, but the analytical significance of catalysis and induced reactions is not given in the book. On page 313 the author should have mentioned the significance of the velocity of precipitation, since the phenomena observed in the precipitation of metal sulfides cannot be understood on the basis of the principle of solubility product alone. One also misses a discussion of oxidation-reduction, adsorption and radioactive indicators, and of colorimetry and spectrophotometry.

The reviewer noticed some serious errors in the book. On page 292 the hydrolysis of silver phosphate and on page 308 that of cupric sulfide is neglected, making the results of the calculations greatly in error. The calculation of the pH of an acid salt, such as Na_2HPO_4 (page 376) and NaHCO_3 (page 413) is entirely wrong; so is Fig. 97, giving the neutralization curve of sodium carbonate with hydrochloric acid. In the discussion of "causes" of ionic reactions (chapter V, part II), the effect of complex formation is not mentioned; this omission is more serious in the rule for dissolving precipitates (page 309).

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