

according to a later observation,<sup>1</sup> is composed of two dyes—resorufin and resazurin, derivatives of phenoxazine.

By further experimentation it was found that 1 cc. of a potassium nitrate solution containing 0.000001 g. of nitrogen as potassium nitrate, when carefully evaporated to dryness, and the residue moistened with chemically pure sulfuric acid, yielded a blue coloration when a small amount of solid resorcinol was added. The extreme delicacy of this test would, therefore, render it valuable to detect minute traces of nitrates and nitrites in residues obtained in the course of a water analysis.

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### NEW BOOKS.

**Molecular Association.** By W. E. S. TURNER. Pp. viii + 170, with diagrams. (Monographs on Inorganic and Physical Chemistry, edited by A. Findlay.) Longmans, Green & Co., 1915. Price, \$1.40 net.

There appears to be a fairly wide-spread impression that molecular association is a phenomenon which occurs relatively infrequently; but this view is erroneous, for further investigation of the matter always extends the list of associated substances, so that it would seem that some degree of association is of very general occurrence. Nor is it generally realized that the degree of association is not a fixed quantity but varies with a number of factors, of which the most important are temperature, pressure, electrical stress and solvent action; so that it is plausible that by a suitable choice of conditions one could obtain any substance partly associated just as one may obtain almost any solid substance in colloidal form. The author brings together the relevant experimental evidence—which, it may be remarked, leaves much to be desired as regards both quality and extent—and exhibits the present status of the question; the discussion will bring before the reader the present plentiful lack of definite information on this important topic. There is a list of 275 references to the text and an appendix, covering more than forty closely printed pages, in which the experimental data on the molecular complexity of dissolved substances are tabulated and summarized; these features alone render the book a desirable addition to the library.

JOHN JOHNSTON.

**Einführung in die Metallographie und Wärmebehandlung.** VON DR. ING. H. HANEMANN, Dozent für Metallographie und Materialkunde an der Königlichen Technischen Hochschule zu Berlin. Berlin: Gebrüder Borntraeger. 1915. vii + 128 pp. Price, 8.50 M.

This book is made up of twelve lectures delivered in a summer course

<sup>1</sup> *Ber.*, 23, 718 (1890).

in the Technical High School of Berlin. The subject matter deals with the fundamental laws of crystallization as applied to metals, the establishment and significance of equilibrium diagrams of binary and ternary alloys, and discussion of special cases of some technically important binary systems and especially of the iron-carbon system. The phenomena of hardening, tempering and annealing of steels, while condensed, are logically and clearly treated, and the reader should obtain a clear idea of the physics of heat treatment, and its relationship to changes in physical properties. Etching of steels for macroscopic and microscopic observation and the interpretation is discussed, and a series of excellent microphotographs appended illustrate the text. Special steels are mentioned briefly.

For those who wish to know something of the principles of the metallography of iron and steel, but do not care for a detailed study, the book is excellent.

HENRY FAY.