TABULATED DATA ON HEAVY WATER

	Ordinary water	31%	63.5%	92%	100% (calcd.)
Density d_{20}^4	0.9982	1.0314	1.0664	1.0970	1.1056 (Lewis)
Refractive index n_{20}^D	1.33293	1.33138	1.32992	1.32849	1.3281
Refractive index n_{20}^C	1.33094	1.32959	1.32824	1.32683	1.3265
Molar refr. (D line)	3.711	.....	.....	.....	3.677
Viscosity η_{20} (mp.)	10.87	11.4	12.7	13.7	14.2
Surface tension 20° (dynes/cm.)	72.75	71.5	69.8	68.1	67.8
Magnetic susceptibility $\chi \times 10^6$/g.	−0.72	.....	.....	−0.65	.....
Molar susceptibility $\times 10^6$	−13	.....	.....	−13	.....

free hydrogen was passed over the iron–iron oxide mixture and the water formed was frozen out in A (Fraction Y). Excess hydrogen was burned at the jet shown.

Fraction X was found to be identical in properties with the initial heavy water. Fraction Y could not be distinguished from ordinary water. There is, therefore, no appreciable concentration of O^{18} in the electrolytic process.

FRICK CHEMICAL LABORATORY
PRINCETON UNIVERSITY
PRINCETON, NEW JERSEY

P. W. SELWOOD
ARTHUR A. FROST

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NEW BOOKS

Ternäre Systeme. Elementare Einführung in die Theorie der Dreistofflegierungen. (**Ternary Systems.** An Elementary Introduction to the Theory of Three-Component Alloys.) By DR. G. MASING, Scientific Consultant, Siemens-Konzern, and Lecturer at the Technical High School of Berlin. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 6, Leipzig C 1, Germany, 1933. viii + 164 pp. 166 figs. 15 × 5 × 23.5 cm. Price, M. 8.30; cardboard cover, M. 9.60.

"The purpose of this work," writes the author, "is . . . to give the fundamentals of the science of ternary systems in complete representation," somewhat freely translated. This has been done to a fuller extent than in any other text, as far as the reviewer knows. Even the standard Roozeboom, in the latest section on three-component bodies, issued as long ago as 1913, omits discussion of the occurrence of solid solutions, which a practical metallurgist could hardly leave out of consideration. Masing's text is particularly complete with respect to the treatment of systems in which solid solution occurs, and is written with thoroughness and clarity. The first eight chapters contain discussion of a purely general nature, on isotherms, crystallization processes and representations of isoplethal sections ("zur Konzentrationsebene sehnrechte Schnitte"). This purely general treatment is intentional, and advantageous to the author's plan of making the treatment complete; an occasional reference to actual systems which show

the peculiarities under discussion might make the book easier reading. The final three chapters discuss the iron–silicon–aluminum alloys, the tin–zinc alloys and the iron–carbon system. The book will be valuable to anyone desiring a more complete understanding of ternary systems than is at present to be had from the text-books previously available.

ARTHUR E. HILL

Grundlagen der Photochemie. (Fundamentals of Photochemistry.) By DR. K. F. BONHOEFFER and DR. P. HARTECK. Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany, 1933. viii + 295 pp. 73 figs. 15 × 22.5 cm. Price, RM. 24; bound, RM. 25.

A series of monographs on chemical reactions, mainly from a physico-chemical standpoint, is auspiciously begun by the present volume. It is promised that problems related to physics and biochemistry, and practical applications, will not be neglected.

The authors are not here concerned with photochemical apparatus or experimental details. Rather, they aim to present the theoretical principles which appear well established as a basis for the explanation of photochemical reactions. Hitherto, the chemist has been obliged to acquire these mainly from the writings of physicists, and to exercise no little critical judgment in so doing.

The first part of the book deals with general theories regarding the excitation of atoms and molecules due to the absorption of light quanta. The second part applies these in detail to the photochemical reactions of greatest interest at the present time. The last part deals with the interpretation of quantum yields and the kinetics of secondary reactions.

In almost all instances, a thorough knowledge of the literature is shown and the discussion of controversial points is in a high degree open minded and intelligent. It should be noted, however, that the quantum yield in the photolysis of uranyl oxalate is not unity, but varies between 0.4 and 0.6 according to the wave length of light absorbed. Also, the secondary reaction involved can scarcely depend upon collisions of excited uranyl ions with oxalate ions, as contended by the authors, unless a chain reaction involving fifty or more members occurs. This follows necessarily from the feeble dissociation of uranyl oxalate and the relatively small extinction coefficient of free uranyl ion.

A thorough study of this excellent book will lead to higher standards in the planning and interpretation of photochemical research.

GEORGE S. FORBES

Organic Syntheses. An Annual Publication of Satisfactory Methods for the Preparation of Organic Chemicals. Vol. XIII. By DR. W. H. CAROTHERS, Editor-in-Chief, L. F. FIESER, R. C. FUSON, JOHN R. JOHNSON, C. R. NOLLER and W. W. HARTMAN. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, 1933. vii + 119 pp. 15.5 × 23.5 cm. Price, $1.75.

The editors of "Organic Syntheses" have devised a means of endowing their publication with perpetual youth: After increasing their number from year to year, they now retire to the honorable position of an "advisory board" and leave the active work to a new editorial board composed entirely of younger men. In the present volume the new board has demonstrated its quality by securing the collaboration of an uncommonly large number of contributors and by presenting the following unusually interesting variety of preparations: Allantoin; Azelaic Acid; 2-Phenyl-4-(3′,4′-dimethoxybenzal)-oxazolone; Benzalphthalide; β-Benzoylpropionic Acid; *n*-Butyl Borate; *iso*-Butyl Bromide; Butyroin; *m*-Chlorobenzaldehyde; 1,4-Dibenzoylbutane; 2,4-Dinitro-

phenylhydrazine; Diphenyl Triketone; Ethoxyacetic Acid and Ethyl Ethoxyacetate; Fluorobenzene; *p*-Fluorobenzoic Acid; Methoxyacetonitrile; Methyl Iodide; α-Methyl-α-phenylhydrazine; Methyl *iso*-Propyl Ketone; 1-Nitro-2-acetylaminonaphthalene; 2-Nitrofluorene and 2-Aminofluorene; 1-Nitro-2-naphthol; *N*-Nitrosomethylaniline; Nitrosomethylurethane; Perbenzoic Acid; *o*-Propiophenol and *p*-Propiophenol; *o*-Toluamide; *sym*-Tribromobenzene; Tricarbomethoxymethane; Veratric Aldehyde.

E. P. KOHLER

BOOKS RECEIVED

August 15, 1933–September 15, 1933

EMIL ABDERHALDEN. "Methodik des Nachweises von Abwehrfermentwirkungen." Handbuch der biologischen Arbeitsmethoden. Abt. IV, Angewandte chemische und physikalische Methoden, Teil 1, Heft 8. Urban und Schwarzenberg, Friedrichstrasse 105B, Berlin N 24, Germany. 70 pp. RM. 3.50.

K. FREUDENBERG. "Tannin, Cellulose, Lignin." Zugleich zweite Auflage der "Chemie der natürlichen Gerbstoffe." Verlag von Julius Springer, Linkstrasse 23–24, Berlin W 9, Germany. 165 pp. RM. 8.80.

PHILIP LENARD. "Great Men of Science. A History of Scientific Progress." Translated from the German by H. Stafford Hatfield. The Macmillan Company, 60 Fifth Ave., New York. 389 pp. $3.00.

KARL MYRBÄCK AND HANS V. EULER. "Das Co-Enzym der alkoholischen Gärung, die Co-Zymase, ihr eBestimmung und Isolierung." TORSTEN THUNBERG. "Eine enzymatisch-chemische Methode zur Bestimmung von Zitronensäure." RUDOLF WEIDENHAGEN. "Karbohydrasen." Abderhalden, Handbuch der biologischen Arbeitsmethoden. Abt. IV, Angewandte chemische und physikalische Methoden, Teil 1, Heft 7. Urban und Schwarzenberg, Friedrichstrasse 105B, Berlin N 24, Germany. 88 pp. RM. 4.

E. H. RIESENFELD. "A Manual of Practical Inorganic Chemistry, Qualitative Analysis and Inorganic Preparations." Translated by P. Rây. Chuckervertty, Chatterjee, and Co., Ltd., 15 College Square, Calcutta, India. 471 pp. Price, Indian, Rs. 6/-; foreign, 9s.

REINHARD SEKA. "Alkaloide." Abderhalden, Handbuch der biologischen Arbeitsmethoden, Abt. I, Chemische Methoden, Teil 11, Heft 6 (Nachtrag zu Abt. I, Teil 9). Urban und Schwarzenberg, Friedrichstrasse 105B, Berlin N 24, Germany. 356 pp. RM. 19.

NEVIL VINCENT SIDGWICK. "Some Physical Properties of the Covalent Link in Chemistry." The George Fisher Baker Non-Resident Lectureship in Chemistry at Cornell University. Cornell University Press, 124 Roberts Place, Ithaca, New York. 249 pp. $2.00.