

pig liver differs from cat liver in its histidine metabolism.

Although degraded by extracts of *Pseudomonas fluorescens* the intermediate was not attacked by slices of rat liver or kidney. This finding is in accord with the fact that L-histidine was quantitatively converted into the intermediate by cat liver extract. It may well be that the mammalian tissue preparations lacked the components necessary for further breakdown of the intermediate. These compounds may either be unstable enzymes

or the acceptors for the one-carbon unit or the amidine group.

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BOOK REVIEWS

Ultraviolet Radiation. By LEWIS R. KOLLER, Ph.D., Research Associate, General Electric Research Laboratory, Schenectady, New York. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1952. ix + 270 pp. 16 × 23.5 cm. Price, \$6.50.

This book has been written to meet in part the practical needs of the non-specialists in radiation for information concerning ultraviolet light. Minimum facts are given regarding the nature of radiation and the units commonly employed in its measurement. Much space is given to sources of radiation. The characteristics of arcs of various types are treated in considerable detail. This is especially true of mercury arcs and carbon arcs which were chosen, respectively, as examples of enclosed and open types. A short chapter is devoted to incandescent sources of radiation including their limitations as ultraviolet emitters. A useful discussion of solar radiation is given, including variations of intensity with seasons, latitudes, altitudes and times of day. The importance of sky radiation as an ultraviolet source is emphasized.

The chapter on transmission is devoted largely to the filter qualities of glasses, quartz, plastics and various solutions. Likewise the chapter on reflections deals principally with the fractions of radiation of different wave lengths which are reflected from surfaces; included are surfaces of metals, glass, pigments, snow, sand and skin. A chapter on applications and effects of ultraviolet light covers briefly such topics as erythema, prevention and cure of rickets, production of vitamin D, germicidal effects, fluorescence effects, etc. The final chapter has an instructive discussion of photoelectric tubes and a brief survey of other devices for measuring the intensity of ultraviolet radiation.

The book is a collection of assorted facts which have been selected to answer the questions which are raised most often by persons unfamiliar with the characteristics and limitations of radiant energy. It fulfills this purpose quite well.

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F. E. BLACET

Tables for the Analysis of Beta Spectra. Applied Mathematics Series 13. By NATIONAL BUREAU OF STANDARDS. United States Government Printing Office, Washington 25, D. C. 1952. iii + 61 pp. 20 × 26 cm. Price, 35 cents.

The major portion of this booklet is devoted to a table of values of the factor representing the effect of nuclear charge upon the shapes of beta spectra. The numbers given are actually values of the expression $\eta^2 F(Z, \eta) / \phi(Z)$, where η is the momentum of the electron, Z is the nuclear charge, $F(Z, \eta)$ is the spectrum correcting function, and $\phi(Z)$ is a constant for the particular nucleus. Separate values, mostly precise to better than 0.05%, are given for both electrons and positrons, all values of Z from 1 through

100 being covered for eighty different values of η ranging up to 7.0 mc.

Also included are: a table of values of three parameters from which the range $\eta > 7.0$ mc. can be covered by substitution in an approximately valid equation; a table for use in making rough corrections for the small screening effect of atomic electrons; and an introductory theoretical discussion by U. Fano describing the significance of the various factors appearing in the formula for the shape of the allowed beta spectrum and also giving examples of the use of the tables in analyzing experimental data.

For many years there has been a serious need for such tables as these, largely because of the mathematical difficulties involved in the exact evaluation of the Fermi function. It seems safe to predict that this booklet, with its collection of excellent information conveniently arranged for use, will prove very popular with β -ray specialists.

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H. W. FULBRIGHT

Paper Chromatography—A Laboratory Manual. By RICHARD J. BLOCK, Department of Biochemistry, New York Medical College, Flower and Fifth Avenue Hospitals, New York, N. Y., and Director, Biochemical Laboratories, The Borden Company, Yonkers, N. Y., RAYMOND LESTRANGE and GUNTER ZWEIF, Biochemical Laboratories, The Borden Company, Yonkers, N. Y. Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. 1952. x + 195 pp. 16 × 23.5 cm. Price, \$4.50.

The present small volume is the first serious attempt to organize and correlate the vast amount of literature that has appeared in the short span of eight years past on the application of paper chromatography to the separation, identification, and estimation of organic and inorganic compounds.

The material of the book is arranged in twelve chapters illustrated with twenty-six diagrams and photographs of apparatus and chromatograms. The first two chapters deal with a brief introduction and discussion of the theory of paper chromatography. In chapters III and IV are described the general qualitative and quantitative procedures which are employed in chromatographic techniques. Chapters V to XI deal with the application of these techniques to the identification and estimation of amino acids, amines and proteins, aliphatic acids and steroids, carbohydrates, purines and pyrimidines, phenols, aromatic acids and porphyrins, miscellaneous organic compounds, antibiotics and vitamins. A very brief treatment of inorganic separations is given in chapter XII.

The section devoted to bibliography in which a good selection of references carries the reader up to the middle of 1951 is well done. It is inherent in a rapidly expanding field that literature should accumulate at such a rate as to

render any published bibliography incomplete before the printers ink has dried. A few references, important in the reviewer's opinion are missing; among these are the papers of Muller and Clegg dealing with a critical discussion of several aspects of chromatography.

In general the description of the techniques employed to prepare, develop and evaluate paper chromatograms and their applications to various separations is adequate for the worker who already possesses some familiarity with the field. Whoever is unfamiliar with this type of microtechniques will experience some difficulty in using the present volume as a "laboratory manual." A number of small but important details are inadequately described. A few of these may be mentioned by way of illustrating this reviewer's heresy in maintaining that a practicing chemist not conversant with microtechniques needs the same detailed directions as a "beginner." They include the application of the sample to the smallest possible area of the paper, the methods for avoiding "tails" or "beards" on the spots of the chromatograms, the rate of fading of the spots in a chromatogram, and a detailed description of the simple but excellent test-tube technique of Rockland and Dunn. The latter is extremely useful for the beginner since it involves no special equipment, is rapid and can be employed for most identification work and particularly for exploratory work in determining suitable solvents and conditions for dealing with large sheets or strips. However, notwithstanding these differences between the treatment of the material by the authors and the reviewer's opinions the present volume is a desirable addition to the book shelf of the organic laboratory.

DEPARTMENT OF CHEMISTRY
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NICHOLAS D. CHERONIS

Five-Membered Heterocyclic Compounds with Nitrogen and Sulfur or Nitrogen, Sulfur, and Oxygen (except Thiazole). By L. L. BAMBAS, Parke, Davis and Company, Detroit, Michigan. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1952. xi + 403 pp. 16.5 × 23.5 cm. Price, \$14.00; subscription price, \$12.60.

Specifically, this volume deals with thiadiazoles and their selenium analogs, dithiazoles, dithiadiazoles, thiatriazoles, oxathiazoles and oxaselenazoles and isothiazoles. The parent ring systems (when known) are presented first, followed by the various fused systems involving other carbocyclic or heterocyclic structures. Included here is the chemistry of such useful intermediates as the Herz compounds and of saccharin and its derivatives.

The bibliography appears to be quite complete; the reviewer found no important omissions in a rapid survey of the literature from 1935 through 1950.

Each chapter contains a complete and uncritical account of the preparation and reactions of the compounds under discussion together with the frequently conflicting theories of their formulation. This is followed when necessary by a more critical section (Discussion). At the end of each chapter in tabular form is presented syntheses and reactions of the compounds together with their solubilities and melting points. The tables, of necessity, involve much duplication of the foregoing material.

The descriptive sections are profusely illustrated with structural formulas which greatly facilitates following the sometimes quite complex chemistry involved. The book is well printed and appears unusually free of trivial errors. Serious errors in these formulas are likewise rare. Much confusion seems to have centered about the thiadiazoloquinoline and the thiadiazoloquinolines, pages 11, 12 and 33. Here the nomenclature is correct, and the errors lie in the formulas presented. To add to the confusion, the reader is referred to reference 2, when in fact, these substances are encountered in reference 5.

Nomenclature of intermediates and by-products is not always in accord with the best usage but is never ambiguous. One of the more spectacular cases involves diphenylthioketene which is encountered (page 5) as "diphenyl methylene thioketone."

From the standpoint of sentence structure and phraseology, the reviewer feels that this book could have been

much improved. However, the presentation is unambiguous, and the volume should prove to be of extreme value to those interested in this phase of heterocyclic chemistry.

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CHAPEL HILL, NORTH CAROLINA

R. L. MCKEE

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February 10, 1953–March 10, 1953

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ROY LESTER WHISTLER AND CHARLES LOUIS SMART. "Polysaccharide Chemistry." Academic Press, Inc., 125 East 23rd Street, New York 10, N. Y. 1953. 493 pp. \$10.80.

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