chromatography of dinitrophenylamino acids by G. Biserte, J. W. Holleman, J. Holleman-Dehove and P. Sautiere (46 pp., 104 refs.); chromatography of flavanoid pigments by J. B. Harbourne (24 pp., 91 refs.); separation of different types of human haemoglobin by H. K. Prins (42 pp. 84 refs.); inorganic adsorption and precipitation chromatography by E. Hayek (20 pp., 211 refs.).

This publication will be extremely useful to everyone whose interests lie in its fields. But for material that is already available in the "Journal of Chromatography," the price is very high.

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Zeitschrift für Elektrochemie. Band 64, Nr. 1. Bericht über das Internationale Kolloquium über schnelle Reaktionen in Lösungen in Hahnenklee/Harz vom 14. bis 17 September, 1959. Edited by M. EIGEN, Göttingen. Verlag Chemie, G.m.b.H., Pappelallee 3, Weinheim/Bergstr., Germany. March 1960. 204 pp. 21 × 29.5 cm. Price, DM. 13.—.

In September, 1959, about a hundred persons met for four intensive days at Hahnenklee in the Harz Mountains near Göttingen. The conference was devoted to the study of fast reactions in solution, and it was beyond question the most exciting meeting this reviewer has ever attended. The papers and much of the discussion have now been collected in a single issue of the "Zeitschrift für Elektrochemie." The issue cannot pack the excitement of the conference itself, but it can give readers a lot of valuable information and provide an inkling of what it was like to be there.

The kinetic study of solution reactions was long confined almost entirely to organic processes because the limitations of human reflexes made it impossible to study the large number of inorganic reactions that went to completion in less than a few seconds. In fact, rapidity of reaction was grafted upon the theory of ionic dissociation, and Walther Nernst of Göttingen hurled verbal thunderbolts at any who dared to question that ionic reactions were "infinitely" fast. By a peculiar quirk of fate, Göttingen has again become Olympus for those interested in the rates of ionic reactions. There Dr. Manfred Eigen has been the key figure in the development of techniques that now permit us to measure rate constants for reactions that seem to reach equilibrium instantaneously.

Techniques certainly provided the dominant theme of the conference, and the discussion was repeatedly directed toward establishing the attainable limits for different methods. The possible ranges of these methods overlap to provide a continuum such that in principle any lifetime greater than 10^{-9} second can already be measured for some reactions. Since not all methods are applicable to all reactions of interest, the practice falls somewhat short of universality, but the measurements already accomplished are impressive in the extreme.

The conference was initiated by Dr. F. J. W. Roughton of Cambridge who told how the study of fast reactions started with his 1923 experiments on flow systems. Rapid mixing has shortened the times accessible by such methods, but the present limit is a few tenths of a millisecond with little prospect of decreasing it by many powers of ten.

The other methods must use previously mixed solutions. When delivery of ions to an electrode becomes a limiting factor in electrochemical measurements, the rates of fast homogeneous reactions can be followed; but discussion pointed up the difficulties of a rigorous interpretation of the data. Resonance methods involve a periodic disturbance of the system at a frequency corresponding to some process of interest; techniques were reported with ultrasound and with nuclear and electronic spin changes. Flash photolysis procedures have been described previously, and the attention of the conference was directed chiefly toward establishing the minimum times attainable for study.

Undoubtedly Dr. Eigen's relaxation techniques created the greatest interest. If an existing equilibrium is perturbed by a small amount, the rate at which the new equilibrium is established is proportional to the displacement from the final state, and the appropriate time constant can be measured for both single and periodic perturbations. Temperature, pressure and electric field all have been used as perturbing influences, and the limits are expected to be reached at times of the order of 10^{-11} second. While such a time is still much longer than the period of a molecular vibration, it is sobering to realize that light travels only about 3 mm. during this interval!

About half of the papers are classified under the heading Reaction Mechanisms, but many of these are concerned with methods as much as with results. The time scales of chemical kinetics have suddenly been extended by several powers of ten, and the first experiments have been chiefly exploratory. As the methods become standardized, we can expect the accumulation of a large body of data to be followed by the understanding that comes with interpretation. These developments are only beginning.

Any collection of symposium papers inevitably suffers from a lack of uniformity, and the effect is somewhat heightened here by the approximately equal division of the contributions into English and German. An organized treatise by a very few authors would make a better reference work than this rather amorphous accumulation, but there is no treatise in the field and this collection will be a useful source of information in the meantime.

The Deutschen Bunsen-Gesellschaft für physikalische Chemie is to be commended for this method of presenting the papers. Many libraries now feel that they must purchase every technical book that appears, and we have reached the frightening situation where almost *any* volume can be produced at a profit. Publishers have succumbed to the temptation and are producing hard backed collections of symposium papers that merely duplicate material already in the journals. The Hahnenklee symposium has been published instead as a single issue of the Zeitschrift für Elektrochemie. No library need buy this in addition to its regular subscription, but any chemist interested in solution reactions will be glad to spend $3 to have this paperback on his own desk.

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Absorption Spectra in the Ultraviolet and Visible Region. Volume I. Edited by Dr. L. LANG, Dr. J. SZOKE, Dr. G. VARSANYI and M. VIZESY, Collaborators. Publishing House of the Hungarian Academy of Sciences, Alkotmany u. 21, Budapest V., Hungary. 1959. Text volume, 80 pp.; Volume I, 414 pp. 24.5 × 19.5 cm. Price, $18.00.

This volume contains a compilation of 172 ultraviolet and visible spectra, including 13 vapor phase spectra, recorded in Hungarian research institutes, and consists of detailed spectral data some of which have been briefly reported in Hungarian or other less common journals. It is intended that future volumes will also contain data recorded in other laboratories.

The authors report data which are not already recorded in similar compilations and deal with such varied compounds as cobalt complexes (8), carotenoids (15), substituted salicylic acids (8), benzanils and related compounds (20), sulfonilamides (7), glucosyl derivatives of benzoic acid and thiazoles (14), diphenyl sulfides (6), phenanthrenes (11), furyl compounds (7), flavones and isoflavones (32), purines (9) and alkaloids (14). The vapor spectra (13) are of benzene and simple halogen derivatives. A compound index and formula index are provided to facilitate in locating substances. The spectra are recorded from *ca.* 200 up to 400 or 600 mμ, many in different solvents or at different *p*H, and are given as graphs of absorbancy with a table of readings at every 5 mμ or less on the reverse side, the various graphs being bound in a ring file. The original literature reference or laboratory reporting the data are also given.

The compilation is clearly printed on gloss paper, but the ring binder is of poor quality, and although a large number of different compounds are dealt with the inclusion of both hydroxycarotenoids and their palmitates and of such uncommon substances as 2-carboxyphenylselenoglycolic acid seems unnecessary. The tables seem reasonably free from errors, although the c^4 is missing from the table on page 100, and the data for N-3-hydroxybenzylidine aniline in 1 *M* sodium hydroxide record a dip at 238 mμ, not shown in the graph, which gives an absorbancy value more like 1.38 instead of the reported 1.08. No discussion of the spectra is included or is any comment made on the fact that the spectra of benzanil in 0.01 *M* perchloric acid is completely different from that in ethanol—a difference which is probably due to hydrolysis.

The text volume, by G. Varsanyi, contains a general discussion of the quantum mechanical basis of spectra, and of the spectra of common chromophores. Included are useful tables for interconverting wave lengths to wave numbers and to fresnels and energy (in kcal./mole), and transmittancy to absorbancy. The discussion is however rather ambiguous in places (*e.g.*, looser electronic structure of sulfur, p. 35, 36) and is phrased in poor English, particularly in pp. 9–12. The comparison of chromophores on pp. 41–44 would be clearer if more data were given. The term "vibronic" (p. 11), used to denote electronic-vibrational (–rotational) spectra is unfortunate since it suggests a vibrational origin of the spectra, and "particle" is preferable to "corpuscule" (p. 9). Some minor typographical errors were noted; compiled p. 5, L. 28, literature p. 54, and the use of J as symbol for iodine (p. 47, 51) as well as errors in the reference section.

This collection of spectra presents data on a variety of classes of organic compounds and will be of use as a reference work to both synthetic and natural product chemists. It should find a place in any library alongside Friedel and Orchin.

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The Plasma Proteins. Volume I. Isolation, Characterization, and Function. Edited by Frank W. Putnam, Department of Biochemistry, College of Medicine, The J. Hillis Miller Health Center, University of Florida, Gainesville, Florida. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1960. xv + 420 pp. 16 × 23.5 cm. Price, $12.50.

This is the first volume of a two-volume treatise on the plasma proteins. It consists of ten chapters, each contributed by a different author. The first chapter is introductory; the second chapter is a practical guide to fractionation and isolation procedures which depend on solubility differences; the third chapter discusses electrophoretic and ultracentrifugal analysis of normal human serum (pathological conditions will be considered in the second volume); the fourth chapter is on the subject of chromatography; and the fifth chapter lists the amino acid analyses (where available) and physical constants for the approximately twenty plasma proteins which have been obtained in pure form. The remaining five chapters describe the properties of individual proteins or protein systems: plasma albumin, α-globulins, macroglobulins, glycoproteins and metal-binding proteins.

The outstanding feature of the book is the care with which it has been edited: the duplication and lack of cross-reference which characterize most books of multiple authorship is absent here. For example, ceruloplasmin is both a glycoprotein and a metal-containing protein and is thus mentioned both in Chapter 9 and 10. A detailed discussion occurs in the latter chapter only, and the reader of Chapter 9 is given just two brief paragraphs and the advice to consult Chapter 10 for a detailed account. Furthermore, it happens that a new and previously unpublished method of isolating ceruloplasmin is given in Chapter 2. A reference to it is given at the appropriate place in Chapter 10.

"The Plasma Proteins" is thus a readable and comprehensive account of the limited area of protein chemistry which it seeks to describe. It shows the remarkable progress which has been made in this field in the past twenty years, best illustrated perhaps by the fact that J. F. Foster, in Chapter 6, is able to give a unified account of all properties of plasma albumin, such as ion binding, denaturation, electrophoretic behavior, etc., in terms of a simple model consistent with all the facts. The book also shows how much is still unknown: for example, complete amino acid analyses are available for only a few of the plasma proteins and sequence studies and X-ray data are virtually non-existent. The book should be useful not only to those who are interested in plasma proteins as such, but to protein chemists and biochemists in general, for the type of information which one wishes to obtain and the methods used to gather it are the same, whether one deals with blood plasma or any of the other chemical factories and transport systems of living media.

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Optical Rotatory Dispersion. Applications to Organic Chemistry. By Carl Djerassi, Vice President, Syntex, S. A. (Mexico), and Professor of Chemistry, Stanford University. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N.Y. 1960. xiii + 293 pp. 16 × 23.5 cm. Price, $9.50.

The last six years have witnessed the emergence of the spectropolarimeter as a powerful and versatile tool in the elucidation of structural and particularly stereochemical problems in organic chemistry. Revival of interest in spectropolarimetry, triggered by the development of commercial instrumentation in 1952, is the outgrowth chiefly of the remarkable researches by Professor Djerassi and his group at Wayne and Stanford. The present book surveys and summarizes the results of these and of allied independent investigations.

The central theme of the book is that the sign and shape of an anomalous rotatory dispersion (RD) curve significantly reflect the stereochemistry of the immediate environment of the optically active chromophore. RD curves may therefore yield useful information about configuration and conformation. This claim is amply documented for the carbonyl chromophore, which is ideally suited for RD studies and which is incorporated in many readily available (from natural sources) structures of rigid conformation and of known absolute configuration. The abundance of experimental material available for this one chromophore is reflected in the organization of chapters, seven of which specifically discuss various classes of ketones (steroids, bicyclic ketones, triterpenoids, monocyclic and aliphatic ketones, α-hydroxyketones, α-haloketones) while only two are devoted to all of the other chromophores (as in nitroalkanes, xanthates, aromatic compounds, disulfides, etc.).

The author has wisely invited other specialists to contribute chapters or sections in areas which they would be most competent to discuss: E. R. Blout on optical rotatory properties of synthetic polypeptides and of proteins (with the stress on the effect of helix formation on RD), A. Moscowitz on theory and analysis of RD curves, J. A. Schellman on RD of amino acids, and A. N. James, B. Sjöberg, A. Savitzky, R. H. Noble, W. Slavin, and T. Porro on instrumentation and methodology.

A chapter on nomenclature introduces and defines the new jargon of organic spectropolarimetry (peak, trough, plain curve, etc.).

The book has a name and compound index but no subject index; the detailed table of contents is intended to serve that purpose. This is an unfortunate decision in my opinion and one which may lead to much unnecessary rummaging. For example, the axial haloketone rule is discussed in sections 9–2, 9–3, 10–3 and 13–4, α,β-unsaturated ketones in sections 4–3, 5–3 and 6–3, and circular dichroism in sections 1–2 and 12–2: to find any one of these items it is necessary to scan the whole table of contents (5 pages); even then the reader may be left with the hollow feeling that he has not been able to make a really effective search.

The field appears to be in a state of active development and the book thus serves the useful function of bringing to the attention of chemists a valuable source of up-to-date information at a time when the foundation has been laid and many exciting developments may be anticipated for the near future; among these will surely be calculations of rotational strengths (which serve as quantitative measures of the interaction of the chromophore with the dissymmetric environment), elucidation of conformational problems in biological polymers, development of instrumentation permitting penetration of the farther ultraviolet, and more extensive exploration of optically active chromophores other than the carbonyl. The timeliness of the book is revealed in the approximately 500 footnotes (several of them repeat citations). According to my count, 19.5% refer to *all* of the pre-1950 literature, 9.0% to 1950–1954, 20.0% to 1955–1956, 25.5% to 1957–1958, 13.5% to 1959 and 12.5%