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.

DIVISION OF CHEMISTRY
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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