

ture as low as 200°, and that the reaction was accelerated by the presence of sodium chloride; consistent rates, however, could not be obtained, since the reaction became slower and slower as time went on, presumably because of the more rapid oxidation at first of the smaller particles or more active patches on the carbon surface.

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RECEIVED MAY 31, 1930
PUBLISHED JULY 3, 1930

THE DECOMPOSITION OF HYDROCARBONS IN THE ELECTRODELESS DISCHARGE

Sir:

In the light of the recent note of Harkins and Gans [THIS JOURNAL, 52, 2578 (1930)] on the decomposition of benzene in the electrodeless discharge, the following observations may be of interest. In 1927 and 1928 the author, while at Yale University, collaborated with Dr. I. A. Black in a study of the spectra of some simple hydrocarbons. Several means of excitation were used in determining the most satisfactory method for producing a spectrum of the unaltered molecule; these methods are

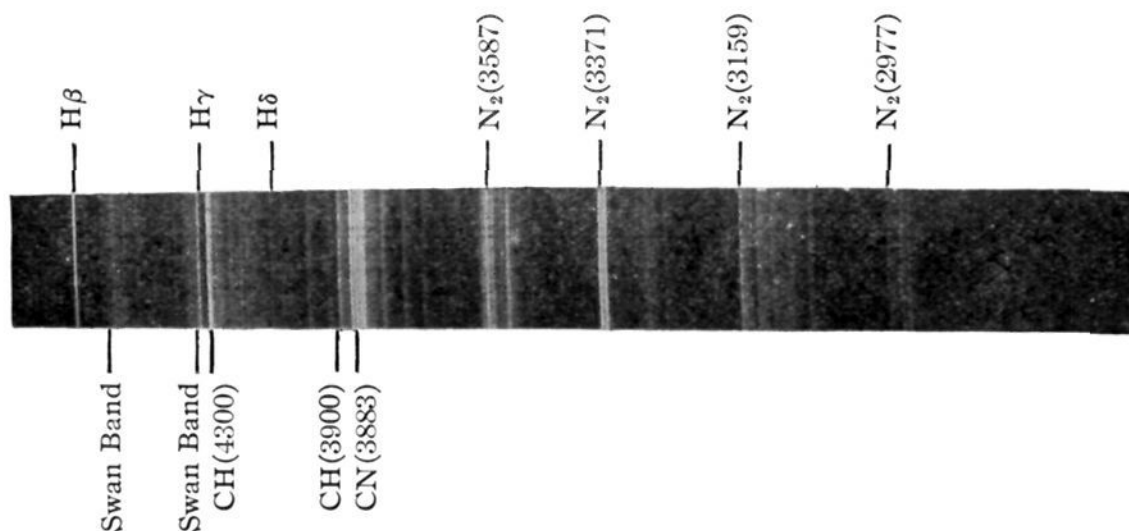


Fig. 1.—Spectrum of the decomposition products obtained from pentane in the electrodeless discharge.

described in our paper on the spectrum of benzene [*Phys. Rev.*, 35, 452 (1930)]. Trial exposures using the electrodeless discharge were made on a number of substances including benzene, pentane, 2,2,4-trimethylpentane, acetylene, chlorobenzene and cyclohexane before the method was discarded because of the excessive decomposition it caused.

Our photographs of benzene show complete agreement with the observations of Harkins and Gans. Three lines of the Balmer series of hydrogen, the Swan bands, as well as the CH bands at λ 4300 and λ 3900,

and the line spectrum of ionized C were observed, the C line at λ 2478 being particularly prominent. All these bands and lines were produced by the other substances; in addition there appeared on most of the plates the second positive group of nitrogen, arising no doubt from the trace of air remaining in the discharge tube. The spectrum of pentane, shown in Fig. 1, and that of acetylene contained some bands which are believed to belong to the CN band group at λ 3883. In the case of chlorobenzene, a well-defined benzene spectrum appeared accompanied by faint "raies ultimes" of Cl at λ 4810, etc. These facts indicate that the process of breakdown in the electrodeless discharge is the same for all these simple hydrocarbons. It should perhaps be mentioned here that in every case save one relatively large amounts of reddish-brown product similar to that described by Harkins and Gans were obtained; the significant exception was cyclohexane by which only a little was produced. A more detailed discussion of these observations will appear in a future publication.

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RECEIVED JUNE 14, 1930
PUBLISHED JULY 3, 1930

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NEW BOOKS

Anorganisch-chemisches Praktikum. Qualitative Analyse und anorganische Präparate. (Laboratory Manual of Inorganic Chemistry. Qualitative Analysis and Inorganic Preparations.) BY DR. E. H. RIESENFELD, Professor at the University of Berlin. Ninth edition, revised with the assistance of Dr. R. KLEMENT. Verlag von S. Hirzel, Leipzig, Germany, 1930. xvi + 393 pp. 29 figs. 13.5 × 20.5 cm. Price, M. 9.

The author points out in the Preface to this ninth edition of the "Praktikum" that it had been usual in German Universities since the time of Liebig and up to the first of this century to begin the study of experimental chemistry with analytical reactions and separations—that is, with qualitative analysis. In 1903, Haber brought back from his travels in this country the American method of instruction, according to which the student first carries out a number of simple experiments which portray before his own eyes the broad relationships of chemical phenomena. This method the author strove zealously to introduce during his teaching activities at Freiburg twenty years ago when the first edition of the laboratory manual was published. The author states that only during the last decade have a number of the large German Universities altered their procedure to the extent that they preface the instruction in analysis with some exercises in the preparation of chemical substances.

This manual as it has now been developed has after the customary discussion of laboratory manipulations a long chapter devoted to prelimi-