

CHEMISTRY

Chairman: KEITH SEYMOUR, Butler University

R. L. Hicks, Franklin College, was elected chairman for 1951.

ABSTRACTS

The changing character of the college undergraduate course in organic chemistry. G. B. BACHMAN, Purdue University.—The teaching of undergraduate organic chemistry is facing many of the problems met in the teaching of general chemistry a quarter of a century ago. These include especially:

1. Those problems associated with the development of "one semester" courses designed to fit into the crowded curricula of non-chemistry majors.

2. Those problems associated with a growing interest in the subject and the attraction to it of students with widely different backgrounds, objectives and attitudes.

3. Those problems associated with a rapidly expanding knowledge of the field in both its practical and theoretical aspects.

4. Those problems associated with a changing emphasis on the various phases of the subject.

The effect of these problems on the character of the course in undergraduate organic chemistry will be discussed and some of the experiences of the author described.

Problems in organic chemistry. JOHN H. BILLMAN, Indiana University.—One of the best ways to find out how well a student understands organic chemistry is to give him a large assortment of problems to work. These problems should be carefully chosen with the idea of illustrating basic facts and stimulating the students' interest in organic chemistry. Problems may be on nomenclature, the characterization and differentiation of compounds, the interpretation of data, and the synthesis of compounds from suggested compounds or from readily available reagents.

It is important to furnish answers to all of the problems so that the student may know if he is using the proper approach in solving problems and to give him confidence in himself.

The chlorination of aliphatic nitriles with phosphorus pentachloride.

R. J. DEARBORN, Wabash College.—Aliphatic nitriles of the structure RCH_2CN may be converted to the corresponding α , δ -dichloronitriles in good yield by the action of phosphorous pentachloride, the other product of the reaction being phosphorus trichloride. Substitution does not

occur on any other carbon atom and only small amounts of the monochloro derivative are formed even when the quantity of phosphorus pentachloride used is reduced.

Phenylquinolines. C. E. KASLOW and MASON HAYEK, Indiana University.—This report concerns the preparation of several phenylquinolines; these substances were prepared for orientation studies in nitration work.

6-Phenylquinoline was prepared by means of a Skraup reaction on 4-acetamidobiphenyl while 8-phenylquinoline was obtained from 2-aminobiphenyl. The yields were 42 and 58% respectively.

The well-known Conrad-Limpach reaction was employed for the preparation of 6-phenyl-4-hydroxyquinaldine from 4-aminobiphenyl and methyl acetoacetate. 8-Phenyl-4-hydroxyquinaldine was obtained in a like manner from 2-aminobiphenyl. Ring-closure of *p*-phenylacetacetanilide in mineral oil at 275° gave 6-phenyl-4-methylcarbostyryl.

Condensation of 2- and 4-aminobiphenyl with ethyl ethoxalylacetate by well-known methods gave 8-phenyl- and 6-phenyl-4-hydroxy-2-quinolinecarboxylic esters, respectively. These were saponified and decarboxylated to yield the phenyl-4-hydroxyquinolines.

Each of the phenylquinolines were nitrated giving high yields but in most instances were mixtures of either mono- or polynitro compounds. However in the case of 6-phenylquinoline, it was shown that nitration gave 6-(*p*-nitrophenyl)-quinoline. Oxidation of the nitro compound gave a nitrobenzoic acid which did not depress the melting point of *p*-nitrobenzoic acid.

Vocational interests of graduate students in chemistry at Indiana University. LEROY H. KLEMM, Indiana University.—A survey of the vocational interests of graduate students in chemistry at Indiana University was made via questionnaire in the fall of 1947 and again in the fall of 1950. A total of 83 questionnaires were returned.

The major results found from the survey are as follows:

1. The age at which the students first decided to specialize in chemistry varied from a minimum of 10 years to a maximum of 25 years. Sixty-three per cent of the students, however, made this decision in the 16-19 age range.

2. Influences considered most significant to the fact that these students were in chemistry included: (a) courses taken in chemistry, (b) teachers, (c) general inclination toward science, (d) hobbies, (e) personal satisfaction in accomplishing new things, (f) scientist friends or relatives, and (g) the desire to work with their hands and minds simultaneously.

3. The ultimate primary goals in chemistry were principally academic (44% of the cases) and industrial (36%) work.

4. Those desiring academic work preferred small- to medium-sized institutions of the liberal arts college or general university type. Most

of them expected to teach undergraduate students. A majority expected to teach graduate students and to perform research themselves. Fewer expected to direct research of students or perform administrative work.

5. Those desiring industrial work preferred medium- to large-sized companies with moderate or vigorous research programs. Most of them expected to perform small scale laboratory research. Almost half of them expected to attain a position of group leader or director of research. There was little interest in routine laboratory work, sales, personnel work, and other such jobs.

6. Almost half of the students definitely desired or felt they might desire to pursue some other work in chemistry between graduation and entrance upon their ultimate vocational objectives. Chief among these intermediate plans were the holding of fellowships and the trying out of industrial work.

Titrimetric determination of magnesium. T. J. PHILLIPS and H. J. WILLIAMSON, Evansville College.—Excess fluoride is added to the magnesium solution and the excess backtitrated with aluminum chloride.

Allyl alcohol as a reagent for the detection of the mercurous ion. FRANK WELCHER, Indiana University (Indianapolis).—Allyl alcohol causes the immediate formation of a slate-gray precipitate when added to a solution of a mercurous salt containing dilute nitric acid. This reaction, which is fairly sensitive, is given by no other common ion. This reaction, therefore, appears to be a specific test for the mercurous ion.

Should Aliphatic & Aromatic Chemistry be taught separately? FRANK WELCHER, KENNETH WHELAN, and JEAN SISKELL, Indiana University (Indianapolis)—Proficiency in the study of organic compounds is acquired by a knowledge of the relationship between structure and properties. The principle of homology is based in part on the idea that compounds possessing common structural units are prepared similarly and react similarly. Since, in many cases the presence of a benzoid ring in an organic molecule exercises a profound effect upon the properties of the latter, it appears that the so-called aromatic hydrocarbons and their derivatives should be considered in a sense as a separate "homologous series". The alternative treatment is, of course, to consider all halogen derivatives of hydrocarbons at one time, aliphatic and aromatic compounds alike and to emphasize their similarities and differences. The decision to consider aromatic and aliphatic compounds separately, regardless of the functional groups which they may possess, is based upon the belief that such practice leads to a simpler presentation of the subject matter of organic chemistry, and readier understanding of it.