

trum (in KBr) indicated the presence of zwitterion formation.

In accord with this structural assignment, refluxing III for 12 hours in 10% sodium carbonate solution gave rise to N-benzylpyrrole and I.

This represents the first recorded Diels-Alder addition with a pyrrole acting as a diene. We hope

to report shortly on further rearrangements of the adduct and its hydrogenation products.

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BOOK REVIEWS

Organic Syntheses. Vol. 36. By N. J. LEONARD, Editor-in-Chief, John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1956. vi + 120 pp. 15.5 × 23.5 cm. Price, \$3.75.

"Tried and true" directions for preparing 35 organic compounds are reported in Volume 36 of "Organic Syntheses." This volume maintains the high standards of its predecessors in its editing, experimental directions and indexing. The compounds treated range from the very simple, such as propionaldehyde, to the somewhat more complex, such as 2-hydroxycyclodecanone. The editors wisely refrain from including syntheses of very complex compounds, which would have limited applicability and interest.

Probably one of the most useful preparations will be the one for diazomethane from *p*-tolylsulfonylethyl nitrosamide. The advantage of this method is that the starting material is stable and soluble in organic solvents.

This new volume will take its place as a worthy addition to the "Organic Syntheses" series, which has for many years been one of the most valuable reference works for the organic chemist.

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The Chemistry of Petrochemicals. By MELVIN J. ASTLE, Professor of Chemistry, Case Institute of Technology, Cleveland, Ohio. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1956. v + 267 pp. 16 × 23.5 cm. Price, \$6.50.

This volume is a valuable source of general information and literature references on organic chemical compounds produced from petroleum. The 14 chapters contain 255 pages of text, many equations and tables of data, and 582 literature references. However, there is no author index and the bibliographies for each chapter are not alphabetically arranged.

The discussion is reminiscent of the books of Carleton Ellis. There is much useful information presented in sufficient detail to introduce the reader to the subject. For example, alkylation is covered in 9 pages, 7 on alkylation of paraffins and 2 on alkylation of aromatics. Two and one-half pages are devoted to the theory of alkylation. This section is based almost entirely on the work of Schmerling. The bibliography omits some important papers in this field, particularly those of Dr. P. D. Bartlett and associates.

The discussion of alkylation with hydrogen fluoride starts off with the statement, "Hydrogen fluoride is increasing in importance as an alkylation catalyst." There is no mention of the fact that HF alkylation was an important process for producing aviation alkylate during World War II, and that nearly all of these HF alkylation plants were shut down, or converted to other use, at the end of the war. In regard to the Ziegler process (p. 103) for poly-

olefins, it is now more or less generally known that mixed catalyses are better than aluminum alkyls alone.

There are other spots in the text which indicate a lack of familiarity with what has actually been going on in industry. For example, on page 155, a process for concentrating benzene by adsorption is described as though the plant had been built and operated. Actually this process for concentrating benzene by adsorption never got beyond the drawing board stage.

On the scientific side, there is a tendency toward rather loose statements, such as the introductory sentence of chapter 2, which reads, "Inasmuch as petroleum is made up largely of paraffin hydrocarbons, these compounds must be considered to be the ultimate starting materials for the preparation of petrochemicals." Benzene and toluene occur in natural petroleum and have been separated commercially as noted on page 153. It is quite clear that paraffins and cycloparaffins naturally occurring in petroleum are not the "ultimate" starting materials for all petrochemicals. However, it is probably true that on a tonnage basis, the chemicals produced from the paraffin and cycloparaffin constituents of petroleum will probably be more important than those produced from the naturally occurring aromatics in petroleum.

The title of this book illustrates the fact that the word "petrochemical" is better adapted to economic rather than scientific discussion. On page 2 there is an estimate that there will be 35 billion pounds of "petrochemicals" produced in 1956 of which 10.5 billion pounds will be "inorganic petrochemicals." However, the book omits entirely any discussion of the chemistry of the "inorganic petrochemicals" such as ammonia and sulfur.

The word "petrochemical," as used in the petroleum industry, brings together products which are economically related, but not chemically related.

In spite of a certain degree of superficiality, which is perhaps unavoidable in a book covering so wide a range of topics, this book should prove of real value to those who need an introduction to the field of the organic chemistry of hydrocarbons, and the more simple organic compounds derivable from hydrocarbons.

RESEARCH AND DEVELOPMENT DEPT.

SUN OIL COMPANY
MARCUS HOOK, PA.

STEWART S. KURTZ, JR.

Polymer Solutions. By H. TOMPA. Academic Press, Inc., 111 Fifth Avenue, New York 3, N. Y. 1956. xiv + 325 pp. 10.0 × 16.5 cm. Price \$8.50.

This is a comprehensive review of current concepts of the solution properties of high polymeric substances. The author has wisely omitted a treatment of polyelectrolytes since this is more properly in the domain of electrolyte theory. Throughout, Dr. Tompa compares theory with experimental results. The book is practically self-contained. All the basic formulas of the thermodynamics of solutions and of the statistics of coiled molecules are derived from first principles. When the author discusses