

dicyclopentadiene (m.p. 176–177.5°. Calcd. for  $C_{15}H_{18}ClNO_2S$ : C, 57.77; H, 5.82. Found: C, 57.56; H, 5.83) identical with the product obtained by addition of hydrochloric acid to the norbornylene double bond of the benzenesulfonamide of amine III. Hofmann degradation of amine IV yields N-methylamine VI (b.p. 80–81° (15 mm.)). Calcd. for  $C_{10}H_{16}N$ : C, 80.48; H, 10.13. Found: C, 80.61; H, 10.04), the structure of which is confirmed by synthesis from the N-methyl imide<sup>9</sup> by lithium aluminum hydride reduction as well as from the *endo* amine III by methylation.

*exo*-Bicyclo[2.2.1]-5-heptene-2,3-dicarboxylic acid imide (m.p. 163.5–164°. Calcd. for  $C_9H_9NO_2$ : C, 66.24; H, 5.56. Found: C, 66.06; H, 5.46), prepared from the corresponding anhydride,<sup>10</sup> yields 2-aza-1,2-dihydro-*exo*-dicyclopentadiene (b.p. 73–74°

(9) H. W. Arnold and N. E. Searle, U. S. Patent 2,462,835 (1949).

(10) D. Craig, *THIS JOURNAL*, **73**, 4889 (1951).

(7.5 mm.)). Calcd. for  $C_9H_{13}N$ : C, 79.95; H, 9.69. Found: C, 79.58; H, 9.89) upon reduction with lithium aluminum hydride. The *exo* amine forms a benzenesulfonamide (m.p. 112–113°. Calcd. for  $C_{15}H_{17}NO_2S$ : C, 65.42; H, 6.22. Found: C, 65.26; H, 6.26) and treatment with 48% hydrobromic acid gives 9-bromo-2-azatetrahydro-*exo*-dicyclopentadiene (b.p. 94–95° (0.2 mm.)). Calcd. for  $C_9H_{14}BrN$ : C, 50.01; H, 6.53. Found: C, 50.01; H, 6.74) which is dehydrohalogenated readily by alcoholic potassium hydroxide to regenerate the *exo* amine.

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## BOOK REVIEWS

**Surface Chemistry. Theory and Applications.** Second Edition. Revised and Enlarged. By J. J. BIKERMAN, Massachusetts Institute of Technology, Cambridge, Massachusetts. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. x + 501 pp. 16 × 23.5 cm. Price, \$15.00.

The change of title from "Surface Chemistry for Industrial Research" does not appear to be justified and one reviewer does not believe that it is a suitable book for students and teachers. A much less sketchy treatment of many of the topics is necessary for the future student, who should, by preference, receive a more thorough and rigorous treatment of a smaller range of topics. The book may be considered as a source-book in surface chemistry and allied subjects. As such, it can fill a useful purpose for the industrial research worker with a large number of examples of and references to the importance of surfaces in technology. The enthusiasm of the author for his subject is evident throughout, but discrimination is not so obvious.

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**Biochemical Preparations.** Volume 6. CARL S. VESTLING, Editor-in-Chief. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1958. ix + 105 pp. 15.5 × 23.5 cm. Price, \$5.25.

The sixth volume of "Biochemical Preparations" has been published. In the fine tradition of the "Organic Syntheses" series, the "Biochemical Preparation" series has reached the point where it no longer seems necessary to review each book. The usefulness of "Biochemical Preparations" for biochemical research workers and for students is obvious.

The biochemist still faces problems in obtaining sufficient amounts of good materials. It is the purpose of this series to present procedures which have been checked and which will be useful in demonstrating research techniques. "Biochemical Preparations" emphasizes isolation procedures and new methods which are simpler and therefore more satisfactory and are constantly being developed. The editors of this series do not hesitate to replace older methods which have been published in earlier volumes with improved methods for the same material.

Excellent examples of this policy are presented in volume 6. The isolation for cytochrome c was presented in volume

2, an addendum was added in volume 5 and a new procedure is presented in the present volume 6. The procedure for the preparation of crystalline muscle phosphorylase has also been modified from the procedure published in an earlier volume.

This volume also presents methods for obtaining deoxyribonucleic acid, 2,3-diphosphoglyceric acid, L- $\alpha$ -glycerophosphorylcholine, 3-hydroxyanthranilic acid,  $\beta$ -hydroxy- $\beta$ -methylglutaric acid, insulin, lanosterol, leucine aminopeptidase,  $\alpha$ -methylserine and bis-(hydroxymethyl)-glycine, crystalline horse oxyhemoglobin, old yellow enzyme, crystalline papain and benzoyl-L-argininamide, phosphoserine, ribonucleic acid, ribulose diphosphate and DL-tryptophan-7a-C<sup>14</sup>.

The properties and purity of the products of each procedure are described and alternate methods for obtaining each product are referenced. There is a cumulative index and a list of compounds of biochemical interest which have appeared in "Organic Syntheses" through volume 38.

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**Conference on Extremely High Temperatures.** Boston, Massachusetts, March 18–19, 1958. Sponsored by Electronics Research Directorate, Air Force Cambridge Research Center. Editors: HEINZ FISCHER and LAWRENCE C. MANSUR. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. xi + 258 pp. 22.5 × 28.5 cm. Price, \$9.75.

For purposes of this conference, extremely high temperatures were taken to mean the range from just below a million degrees to above a hundred million degrees Kelvin.

The first portion of the conference was devoted to methods of production of these high temperatures using magnetic acceleration, various types of electric arcs, and other electrical methods. Electrical currents of millions of amperes were required for most methods. The next section of the conference was devoted to the measuring of temperature by various optical methods as well as a microwave thermometer. The third section of the conference was entitled "Plasma Analysis" and dealt with some of the processes taking place within plasmas. The final section dealt with application of high temperature plasma. These applications ranged from the consideration of some of these plasma sources as reactor motors for interplanetary travel to labora-