

Proceedings of the Iowa Academy of Science

Volume 41 | Annual Issue

Article 51

1934

Reduction of Furan and the Preparation of Tetramethylene Derivatives

Donald F. Starr
Iowa State College

R. M. Hixon
Iowa State College

Copyright ©1934 Iowa Academy of Science, Inc.

Follow this and additional works at: <https://scholarworks.uni.edu/pias>

Recommended Citation

Starr, Donald F. and Hixon, R. M. (1934) "Reduction of Furan and the Preparation of Tetramethylene Derivatives," *Proceedings of the Iowa Academy of Science*, 41(1), 169-170.

Available at: <https://scholarworks.uni.edu/pias/vol41/iss1/51>

This Research is brought to you for free and open access by the Iowa Academy of Science at UNI ScholarWorks. It has been accepted for inclusion in Proceedings of the Iowa Academy of Science by an authorized editor of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

more than the base gasoline at the present time. The National use of such a blend would require 600,000,000 bushels of corn or its equivalent in other farm crops each year. This outlet is of such a magnitude that it can readily take care of the annual variations in the production of agricultural materials. Further, the use of power alcohol can be expanded as required to take the increasing output of a profitable scientific agriculture. The development of alcohol engines is anticipated and the use of power alcohol can be expected to increase very greatly as petroleum supplies are depleted. Alcohol can be made from agricultural products at a price which will allow it to compete with fuels other than petroleum so that it must be considered an economically efficient industry of the future, whose immediate development is desirable.

Agriculture is in the position of choosing now the future route it shall follow. If it elects to cut heavily into production, revert to power animals and in general become more self sustaining, it can no longer purchase the products of industry in important quantity. If it be allowed to expand its production beyond the limits of domestic food requirements, it can continue as a gainful occupation and again exchange its products for those of industry. The power alcohol program furnishes a means for establishing and maintaining the latter arrangement.

DEPARTMENT OF CHEMISTRY,
IOWA STATE COLLEGE,
AMES, IOWA.

REDUCTION OF FURAN AND THE PREPARATION OF TETRAMETHYLENE DERIVATIVES

DONALD F. STARR AND R. M. HIXON

During the study of the nitrogen heterocyclics, a convenient method of preparing δ -chlorovaleronitrile was desired. The synthesis developed involved the procedure of Gilman and Louisinian for decarboxylation of furoic acid. The furan obtained was reduced in the presence of palladous oxide palladium black giving a 95 per cent yield of tetrahydrofuran which was split with hydrogen chloride yielding 55 per cent of the theoretical tetramethylene chlorohydrin. Treatment of the chlorohydrin with phosphorus tribromide gave a 98 per cent yield of tetramethylene chlorobromide which gave a 52 per cent yield of δ -chlorovalero nitrile when re-

acted with sodium cyanide. The chemicals required and the operations involved lend themselves to the preparation of appreciable quantities.

IOWA STATE COLLEGE,
AMES, IOWA

THE ALKALINE DECOMPOSITION OF WOOL KERATIN

MILDRED BARR AND RACHEL EDGAR

The alkaline hydrolysis of wool keratin effected in ten hours at 25°, 40°, and 55°C. has been followed by determination of the weight, nitrogen, sulfur, and wet breaking strength of the residual wool fabric.

The decrease in weight, nitrogen, sulfur, and wet breaking strength and the ratio of the sulfur of the hydrolysate to that of the residual wool have been shown to be greater, the greater the concentration of alkali or the greater the temperature. The weight of the residual wool has been shown to be a linear function of the alkali concentration, the nitrogen and sulfur to be functions of the form, $y = ax^b$. The ratio of sulfur to nitrogen decreased with increasing concentration of alkali or increasing temperature.

DEPARTMENT OF CHEMISTRY,
IOWA STATE COLLEGE,
AMES, IOWA.

HYDROLYSIS VELOCITY OF KETIMINES — STERIC HINDRANCE EFFECT

J. B. CULBERTSON, WILLIAM REYNOLDS AND CLARENCE MAIN

Additional work has been carried on to gain further information concerning the significance of ortho-substituted groups upon the rate of which diphenyl ketimine hydrochlorides hydrolyze to ketones. In this particular study the following isomeric ketimines have been prepared and their hydrolysis velocities determined: 2, 6-dimethyl-, 2, 5-dimethyl-, 2, 4-dimethyl-, and 3, 5-dimethyl-diphenyl ketimines hydrochlorides. The first of these with the two ortho-substituted methyl groups is hydrolyzed appreciably only after prolonged boiling with water. The last with no ortho-substi-