

# Proceedings of the Iowa Academy of Science

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Volume 36 | Annual Issue

Article 55

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1929

## The Synthesis of 4-Hydroxy and 2-Hydroxy-Diphenyl Ketimines

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### Recommended Citation

Vittum, Paul; Anderson, Richard; and Culbertson, J. B. (1929) "The Synthesis of 4-Hydroxy and 2-Hydroxy-Diphenyl Ketimines," *Proceedings of the Iowa Academy of Science*, 36(1), 266-267.  
Available at: <https://scholarworks.uni.edu/pias/vol36/iss1/55>

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Delta-bromofurfural has been prepared by the bromination of furfural diacetate. Organometallic compounds and derivatives from them have been prepared from 1-tetrahydro-furyl-3-bromobutane. Tetrahydrofuryl-p-toluenesulfonate has been prepared and tested for its alkylating action. A series of halogen furoic and furylacrylic acids has been prepared in antiseptic studies, and their mercury and copper salts are being tested for their possible applications as fungicides.

IOWA STATE COLLEGE,  
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A STUDY OF THE HOESCH-HOUBEN SYNTHESIS IN  
THE PREPARATION OF AROMATIC KETIMINES  
AND HYDROXY-PHENYL IMINOESTERS

EVA BRESSON and J. B. CULBERTSON

This synthesis involves the condensation of a phenol with a nitrile (aliphatic or aromatic). It is effected by the passage of dry hydrogen chloride through their solution in anhydrous ether, with or without the addition of dry zinc chloride. Anhydrous aluminum chloride was substituted for zinc chloride in some cases.

In the present study benzonitrile was employed in every case with the following phenols and phenol ethers: phenol, the three cresols, quinol, catechol, pyrogallol, carvacrol resorcinol monomethyl and dimethyl ethers.

With phenol, the three cresols, catechol, pyrogallol and carvacrol, no definite condensation products could be isolated. Quinol gave a double compound of p-hydroxyphenyl imino-benzoate with zinc chloride. Without zinc chloride the free p-hydroxyphenyl imino-benzoate was obtained. Resorcinol monomethyl ether gave free 2-methoxy-4-hydroxydiphenyl ketimine when aluminum chloride was employed and an addition compound with zinc chloride.

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THE SYNTHESIS OF 4-HYDROXY- AND 2-HYDROXY-  
DIPHENYL KETIMINES

PAUL VITNUM, RICHARD ANDERSON, and J. B. CULBERTSON

These syntheses were carried out through the action of the corresponding hydroxy-nitrile upon magnesium phenyl bromide in an

anhydrous ether medium. Over two equivalents of the Grignard reagent were employed, one to react with the phenol group and the other with the nitrile. The addition compound was decomposed with water and ammonium chloride at about -15 degrees C. The ketimine extracted with ether was precipitated as the hydrochloride by the addition of dry hydrogen chloride.

The hydroxynitriles were prepared from the corresponding hydroxy-aldehydes by the action of acetic anhydride on their oximes. Some modifications were worked out in the preparation of the oximes and the nitriles.

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### THE EFFECT OF MANGANESE ON THE GROWTH OF RATS

V. E. NELSON, J. M. EVVARD, and W. E. SEWELL

From the laboratories of Physiological Chemistry and Animal Husbandry, Iowa State College, Ames. Manganese in small amounts stimulated the growth of rats. The basal diet employed consisted of casein 18, yeast 12, cod liver oil 5, salts 185, 3.7, and dextrin 61.3. Manganese sulphate was fed at two levels, 100 and 600 parts per million of ration. In 56 days the control gained 1.78 grams daily and consumed 434 grams of feed per 100 of grain. On the smaller manganese allowance the gain was 2.06 grams, and the feed requirement was 391.4 grams for 100 gain. On the larger manganese allowance the figures were 1.69 and 458.5. Apparently the 600 parts of manganese sulphate per million inhibited growth.

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### THE COPPER CONTENT OF LIVERS AND LIVER EXTRACTS

G. N. QUAM

Stated in mg. per kg. beef liver has been found to contain 16 to 30 mg. for the adult and for calf liver McHargue has reported 161.3 mg. while Robscheit-Robbins and others reported 145 mg. Adult hog liver yielded an average of 50 mg. per kg. A human fetal liver yielded 69.36 mg. per kg.; that of a still-born child 28