

(8) or else the hypothesis that chlorophyll acts as a donor of hydrogen in photosynthesis should be abandoned.

Acknowledgments.—We wish to thank Professors G. K. Rollefson and J. Franck for many helpful suggestions and discussions. We are indebted to Professor E. O. Lawrence and members of the Radiation Laboratory, particularly Dr. M. D. Kamen, for the tritium samples.

Summary

1. The formation of chlorophyll containing T could not be detected during photosynthesis of

Chlorella pyrenoidosa in HTO + H₂O.

2. No (<5%) thermal exchange was observed between purified chlorophyll and 80% ethanol containing HTO.

3. The implications of these results for the theory that chlorophyll acts as a hydrogen donor in photosynthesis are discussed.

4. It is pointed out that repetition of the experiments herein described using 100% D₂O would avoid the question of isotope separation and make possible an unequivocal conclusion regarding the role of chlorophyll.

BERKELEY, CALIFORNIA RECEIVED SEPTEMBER 14, 1942

NOTES

Characteristics of β -[2,5-Dimethoxyphenyl]- β -hydroxyisopropylamine Hydrochloride

BY RICHARD BALTZLY AND JOHANNES S. BUCK

This compound was reported recently¹; subsequent investigation makes it evident that the substance to which that formula was attributed is actually β -[2,5-dimethoxyphenyl]- β -oxoisopropylamine hydrochloride. This could have been anticipated² but was not at the time. The error arose partly from the difficulty of interpreting small absorptions of hydrogen when using a catalyst (palladized charcoal) that itself binds relatively large amounts of hydrogen and partly from adverse conditions over which the analyst had no control.

The substance previously obtained (m. p. 176° dec.) when dissolved in water and reduced with hydrogen and platinum-black absorbed 1 mole of hydrogen. A new hydrochloride was isolated melting at 215°.

Anal. Calcd. for C₁₁H₁₈O₂N: C, 53.31; H, 7.33. Found: C, 53.43; H, 7.53.

When the corresponding base was acetylated with acetic anhydride a diacetyl derivative was formed melting at 120° and crystallizing from ethyl acetate-hexane in parallelogrammatic plates.

Anal. Calcd. for C₁₅H₂₁O₅N: C, 60.98; H, 7.17. Calcd. for C₁₈H₁₇O₄N: C, 62.12; H, 6.83. Found: C, 61.09; H, 7.30.

THE BURROUGHS WELLCOME & CO. U. S. A.
EXPERIMENTAL RESEARCH LABORATORIES
TUCKAHOE, NEW YORK RECEIVED OCTOBER 24, 1942

(1) Baltzly and Buck, *THIS JOURNAL*, **62**, 164 (1940).
(2) Cf. Hartung, *ibid.*, **53**, 4149 (1931).

Identification of *o*- and *p*-Sulfobenzoic Acids¹ as their S-Benzylthiuronium Salts

BY E. CAMPAIGNE² AND C. M. SUTER³

The structure of the alkylated benzenesulfonic acids may be partially clarified by oxidation to the sulfobenzoic acids. The identity of the *o*-, *m*- and *p*-sulfobenzoic acids may be determined by conversion to the acid chlorides and to the amides.⁴ This involves separation and drying of the salts of the sulfobenzoic acids, and the somewhat tedious conversion to the chlorides with a phosphorus halide. The use of S-benzylthiuronium chloride as an analytical reagent for sulfonic acids⁵ has recently been reported. Since the benzylthiuronium derivatives are prepared in water solutions, the use of this reagent should give a quick and easy method for the identification of the oxidation products of alkylbenzenesulfonic acids and related compounds.

The S-benzylthiuronium salts of *o*- and *p*-sulfobenzoic acid were obtained in good yield from water solutions of the acid sodium or ammonium salts, but the derivative of the *m*-sulfobenzoic acid was found to be quite soluble in water, and could not be isolated conveniently. The *o*-sulfo-

(1) This investigation was supported by a grant from the Abbott Fund of Northwestern University.

(2) Present Address: University of Texas, Medical Branch, Galveston, Texas.

(3) Present Address: Winthrop Chemical Company, Inc., Rensselaer, N. Y.

(4) Beilstein's "Handbuch," 4th ed., Vol. XI, p. 369.

(5) Chambers and Watt, *J. Org. Chem.*, **6**, 376 (1941).