eric acid (m. p. 97–97.5°, for $C_{12}H_{17}O_4NS$—Calcd.: C, 53.12; H, 6.32. Found: C, 53.14; H, 6.32) which was converted to the N-benzoyl derivative (m. p. 126.5–127.5°, for $C_{19}H_{21}O_5NS$—Calcd.: C, 60.77; H, 5.63. Found: C, 60.70; H, 5.53). The Curtius degradation through the hydrazide (m. p. 140–141°, for $C_{17}H_{19}O_4N_3S$—Calcd.: C, 56.49; H, 5.30. Found: C, 56.40; H, 5.57), and the azide (dec. 99–100°, for $C_{17}H_{16}O_4N_4S$—Calcd.: C, 54.83; H, 4.33. Found: C, 55.11; H, 4.53) gave 3-benzoylamino-4-carbethoxyamino-2-thiophenevaleric acid (m. p. 156.5–157.5°, for $C_{19}H_{22}O_5N_2S$—Calcd.: C, 58.44; H, 5.68. Found: C, 58.88; H, 5.72) when the azide was refluxed with absolute alcohol. The final product, 2′-keto-3,4-imidazolido-2-thiophenevaleric acid (m. p. 253–254° with decomposition, for $C_{10}H_{12}O_3N_2S$—Calcd.: C, 49.98; H, 5.03. Found: C, 50.33; H, 5.25) was prepared from the urethan by hydrolysis to the diamine and immediate treatment with phosgene.

Ultraviolet absorption curves prepared by Dr. J. M. Vandenbelt show that the compound has strong absorption in the region 250 to 270 mμ, with the peak value at 260 mμ having a molar extinction coefficient of approximately 17×10^{-3}. The curve closely corresponds with the curves for 2′-keto-3,4-imidazolido-2-γ-phenoxypropylthiophene (m. p. 174–174.5°), 2′-keto-3,4-imidazolido-2-γ-benzyloxypropylthiophene (m p. 127–127.5°) and 2′-keto-3,4-imidazolido-2-γ-hydroxypropylthiophene (m. p. 138–139°), all of which have been prepared and characterized during this work.

The authors gratefully acknowledge the assistance of A. W. Spang who did the microanalyses. Details for the preparation of all compounds and the results of biological tests for biotin and antibiotin activity will be forthcoming.

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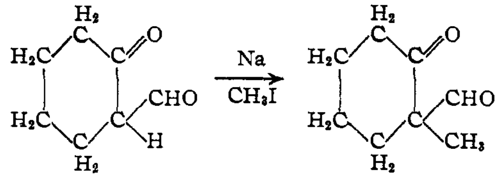
RECEIVED MAY 20, 1944

ATTEMPTED REPETITION OF A REPORTED TOTAL ASYMMETRIC SYNTHESIS

Sir:

In a recent letter to the editors of *Nature*, Paranjape, Phalnikar, Bhide and Nargund[1] report the synthesis of several optically active substances from inactive starting materials without the use of any asymmetric reagents or catalysts. They report that the asymmetric synthesis occurred at the following step in their series of reactions



(inactive) $[\alpha]_D$ −26.22

The reported activity was determined on the crude material, since the methylated formylcyclohexanone was reported to be an unstable liquid, impossible to purify by distillation.

An attempt has been made in these Laboratories to repeat this extraordinary result, which would not be predicted on the basis of any known theory of optical activity.

Inactive formylcyclohexanone was prepared according to the method of Rupe and Klemm,[2] and the methylation was carried out using two different techniques.

In the first trial, formylcyclohexanone was added to a 10% ethanolic solution of sodium ethylate and refluxed with methyl iodide. This yielded, after evaporation of the solvent and washing with water, a reddish liquid, a portion of which darkened and resinified when an attempt was made to distill it. The crude material had a specific rotation of zero, with an error of ±0.7° due to the difficulty of taking readings on such a comparatively strongly colored material.

In the second synthesis, the sodium salt of the formylcyclohexanone was suspended in toluene and allowed to react with methyl iodide. This procedure yielded a much clearer product after removal of the solvent, and it was possible to determine that the material was totally inactive within the 0.01° accuracy of the Zeiss polarimeter. Readings were taken on the material itself as well as on chloroform solutions of it as reported by the Indian authors.

Considerable speculation on possible sources of their reported results has yielded no reasonable explanation.

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[1] K. D. Paranjape, N. L. Phalnikar, B. V. Bhide and K. S. Nargund, *Nature*, **153**, 141 (1944).

[2] H. Rupe and Otto Klemm, *Helv. Chim. Acta*, **21**, 1539 (1938).