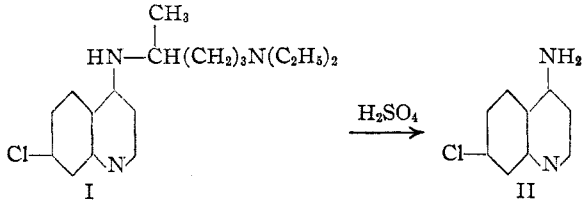
NOTES

The Dealkylation of 4-(4-Diethylamino-1-methylbutylamino)-7-chloroquinoline, SN 7618[1]

By Robert H. Baker, R. M. Dodson[2] and Byron Riegel

In an attempted sulfonation of 4-(4-diethylamino-1-methylbutylamino)-7-chloroquinoline,[3] SN 7618, I, it was found that concentrated sulfuric acid at 200° would remove the side chain from the compound and that 4-amino-7-chloroquinoline, II, could be isolated from the reaction in 41% yield.



Sulfur dioxide was evolved during the reaction and carbonaceous material was formed. This reaction proved useful in determining the structure of 3-bromo-4-(4-diethylamino-1-methylbutylamino)-quinoline.[4] When a solution of this compound in concentrated sulfuric acid was heated to 180–190° for fifteen minutes, the side chain was removed. 3-Bromo-4-aminoquinoline, m. p. 202° after recrystallization from low boiling petroleum ether, was isolated from the reaction solution. Claus and Howitz[5] report the melting point of this compound to be 203°. No attempt was made to isolate the degradation products of the side chain from either of these reactions.

This reaction appears to be very similar to that used by Hickinbottom[6] for the elimination of tertiary alkyl groups from alkylanilines. He found that *t*-butyl-, *t*-amyl- and *t*-hexylaniline yielded aniline when heated with 15 *N* sulfuric acid at 110–140°. Concentrated hydrobromic acid and hydriodic acid and 70% phosphoric acid were found to have a similar action. It should also be noted that Drake[7] has reported that hydriodic acid at temperatures above 100° will cleave an excessive amount of the side chain from 8-(5-*i*-propylaminoamylamino)-6-methoxyquinoline. Concentrated sulfuric acid can be used for the dealkylation of these quinoline derivatives because of the resistance of the quinoline nucleus to sulfonation.

Experimental[8]

4-Amino-7-chloroquinoline, II.—A solution of 5.0 g. of 4-(4-diethylamino-1-methylbutylamino)-7-chloroquinoline, I, in 22 ml. of concentrated sulfuric acid was heated rapidly in an oil-bath. At 180° a gas containing sulfur dioxide was evolved. This evolution ceased within fifteen to twenty minutes after the temperature had reached 200–210°. The black reaction mixture was then cooled rapidly and poured over ice. The resulting solution was diluted to 200 ml. with water, decolorized with Nuchar C, and made basic with ammonium hydroxide. The product which precipitated was extracted with ether; the ether solution was dried with sodium sulfate, and the ether was removed on a steam-bath. The residue that remained was crystallized from a mixture of benzene and Skellysolve B (petroleum ether, b. p. 60–70°) to give 1.14 g. of product, m. p. 148.5–149.5°. The reported[9] m. p. is 147°.

Anal. Calcd. for $C_9H_7ClN_2$: C, 60.52; H, 3.95; N, 15.69. Found: C, 60.92; H, 4.08; N, 15.03.

3-Bromo-4-(4-diethylamino-1-methylbutylamino)-quinoline,[4] when treated in the same manner, gave 3-bromo-4-aminoquinoline, m. p. 202°.[5]

(1) This work was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Northwestern University.

(2) National Research Council Predoctoral Fellow, 1946–1947.

(3) N. L. Drake, H. J. Creech, D. Draper, J. A. Garman, S. Haywood, R. M. Peck, E. Walton and J. O. Van Hook, This Journal, **68**, 1214 (1946).

(4) B. Riegel, G. R. Lappin, C. J. Albisetti, Jr., B. H. Adelson, R. M. Dodson, L. G. Ginger and R. H. Baker, *ibid.*, **68**, 1229 (1946).

(5) Ad. Claus and H. Howitz, *J. prakt. Chem.*, **158**, 232 (1894).

(6) W. J. Hickinbottom, *J. Chem. Soc.*, 1070 (1933).

(7) N. L. Drake, J. Van Hook, J. A. Garman, R. Hayes, R. Johnson, G. W. Kelley, S. Melamed and R. M. Peck, This Journal, **68**, 1529 (1946).

(8) We are indebted to Margaret Ledyard for the microanalyses. All melting points were taken with a Fischer–Johns melting point apparatus.

(9) U. S. Patent 2,233,970, March 4, 1941.

Department of Chemistry
Northwestern University
Evanston, Illinois Received December 9, 1946

A Structure Proof for 4-(4-Diethylamino-1-methylbutylamino)-7-phenoxyquinoline

By R. O. Clinton[1] and C. M. Suter

Drake and co-workers[2] and Riegel and co-workers[3] have recently published the synthesis of 4-(4-diethylamino-1-methylbutylamino)-7-phenoxyquinoline (SN-10,663), tentatively assigning the structure on the basis of analogy with similar compounds prepared by the ethoxymethylene malonic ester synthesis. The same compound had been prepared in these Laboratories by the oxalacetic ester synthesis[4,5] prior to the appearance of the above-cited papers, and the structure rigorously proved to be that of the 7-isomer by two independent methods, as outlined in the accompanying chart.

4-Chloro-7-phenoxyquinoline was converted to the 4-hydrazino compound, which when oxidized with copper sulfate solution[6] gave 7-phenoxy-

(1) Present address: Gasparcolor, Inc., Hollywood, California.

(2) Drake, *et al.*, This Journal, **68**, 1208 (1946).

(3) Riegel, *et al.*, *ibid.*, **68**, 1264 (1946).

(4) Surrey and Hammer, *ibid.*, **68**, 113 (1946).

(5) Steck, Hallock and Holland, *ibid.*, **68**, 129 (1946).

(6) Thielepape, *Ber.*, **55**, 136 (1922); Thielepape and Spreckelsen, *ibid.*, 2929 (1922).