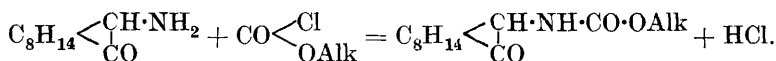


IV.—*Camphorylcarbamates and their Physiological Action.*

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FORSTER and FIERZ (T., 1905, 87, 110) prepared methyl and ethyl camphorylcarbamates by the interaction of camphorylcarbimide with the corresponding alcohols, but the method and also the yields were unsatisfactory. A very simple method of preparation consists in the interaction of aminocamphor and alkyl chloroformates, the urethanes being obtained in almost quantitative yield :



Thirty-seven grams of *isonitrosocamphor*, dissolved in 150 c.c. of 30 per cent. sodium hydroxide, were reduced with 37–40 grams of zinc dust, the base was removed with ether and extracted therefrom with 40 per cent. hydrochloric acid. The aqueous solution was twice extracted with 50 c.c. of ether and the dissolved ether removed by a current of air at 80°. The solution of aminocamphor hydrochloride, mixed with 100 c.c. of 30 per cent. sodium hydroxide, was heated at 60° and stirred mechanically while the chloroformic ester (110 per cent. of the theoretical quantity) was added slowly. The urethane, which separated as a viscous mass, was distilled under diminished pressure. *isoAmyl* and *allyl camphorylcarbamates* are viscous, oily liquids; the others mentioned in the table crystallise in long, lustrous needles.

Camphorylcarbamate.	M. p.	B. p.	$[\alpha]_D$ in $CHCl_3$.
Methyl	110°	169° (11 mm.)	+ 39.4°
Ethyl	88	178 (13 mm.)	+ 35.1
<i>iso</i> Propyl	73	170 (10 mm.)	+ 35.3
<i>iso</i> Butyl	83	184 (11 mm.)	+ 33.9
<i>iso</i> Amyl	liquid	199 (11 mm.)	+ 34.2
Allyl	„	186 (10 mm.)	+ 34.3

The analytical data are recorded in Dr. W. Müller's thesis (Zürich, 1923).

Allyl Carbonate.—The oil obtained by the action of carbonyl chloride upon allyl alcohol is mixed with water, when two oily layers separate. The heavy oil is allyl chloroformate, which boils at 110°, not 180° as stated by Thiele and Dent (*Annalen*, 1880, 205, 227; 1898, 302, 269). The light oil on distillation yields *allyl carbonate*, b. p. 166°/730 mm., as a mobile liquid of unpleasant odour (Found: C = 59.03; H = 7.28. $C_7H_{10}O_3$ requires C = 59.15; H = 7.04 per cent.).

The physiological action of these camphorylcarbamates was examined with the hope that they would produce the combined

effects of camphor and the urethanes. The investigation was undertaken by Prof. Loewy in the laboratories of the Aktiengesellschaft für Anilinfabrikation, Berlin. He reported that their pronounced poisonous action renders these compounds unsuitable for practical application. Administered to dogs in doses of 0.3 gram per kilogram of body-weight, they had no marked action on the heart, but induced slow respiration, and sleep suddenly interrupted by strong convulsions.

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