LETTERS TO THE EDITOR

SYNTHESIS AND DEHYDROCYANATION OF N-SUBSTITUTED 11,14-DICYANOPERHYDROACRIDINES

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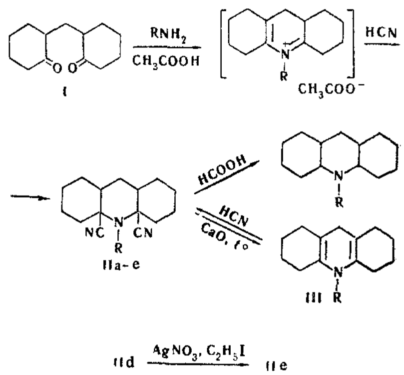
Attempts to obtain N-substituted 11,14-dicyanoperhydroacridines by the reaction of $RNH_2 \cdot HCl$ and KCN with 2,2'-methylenedicyclohexanone (I) in aqueous ethanol, by analogy with the synthesis of 11,14-dihydroper-hydroacridine itself [1], have been unsuccessful. Under these conditions hydrocyanation takes place.

However, when the reaction is carried out in 60–80% acetic acid, cycloaminocyanation takes place readily with the participation of various amine components, including glycine.

The reaction obviously takes place via the original formation of N-substituted decahydroacridines which then readily add hydrocyanic acid:



The reaction is carried out by adding a solution of I in CH_3COOH slowly (in the case of **IIc**, dropwise) to a solution of RNH_2 and KCN in 50–70% CH_3COOH.

The structure of the compounds obtained was confirmed (in the case of **IIa**, **IIc**, and **IId**) by reductive dehydrocyanation, which took place when the dicyanides were boiled with 85% HCOOH and enabled them to be converted into the known N-methyl- and N-phenylperhydroacridines [3] (after being boiled with HCOOH, **IId** was subjected to decarboxylation in glycerol at 200° C).

On dry distillation with an equimolar amount of CaO, **IIc** readily undergoes dehydrocyanation with the formation of N-phenyldecahydroacridine **III** [4]. The product obtained is extremely unstable and absorbs atmospheric oxygen. Under the action of KCN in CH_3COOH, it adds 2 moles of HCN, being reconverted into **IIc**.

REFERENCES

1. V. A. Kaminskii and M. N. Tilichenko, KhGS [Chemistry of Heterocyclic Compounds], 3, 708, 1967.

2. M. N. Tilichenko and V. A. Kaminskii, ZhOKh, 34, 356, 1964.

3. V. I. Vysotskii, Abstracts of Papers at the XII-th Scientific Conference of DVGU [Far Eastern State University], Vladivostok [in Russian], 199, 1967.

4. L. R. Freimiller and I. M. Nemec, US patent no. 3326917; C. A., 68, 49469c.

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Characteristics of the Compounds Obtained

Compound	R	Mp, °C	Empirical formula	Found, %			Calculated, %			Yield, %
				C	H	N	C	H	N	
IIa	CH_3	201—203	$C_{16}H_{23}N_3$	74.68	8.90	16.40	74.71	8.91	16.34	70
IIb	CH_2CH_2OH	194—195	$C_{17}H_{25}N_3O$	71.01	8.85	14.96	71.08	8.71	14.63	73
IIc	C_6H_5	240—241	$C_{21}H_{25}N_3$	79.70	8.13	13.22	79.00	7.88	13.17	71
IId	CH_2COOH	135—138	$C_{17}H_{23}N_3O_2$	67.90	7.91	14.10	67.77	7.66	13.95	70
IIe	$CH_2COOC_2H_5$	169—171	$C_{19}H_{27}N_3O_2$	69.42	8.42	12.49	69.28	8.26	12.75	77
III	C_6H_5*	—	$C_{19}H_{23}N$	85.98	9.13	5.59	86.04	8.68	7.28	75

* Bp, 17-172 °C (0.1 mm); according to the literature [4], bp 160-165° C (0.07 mm).