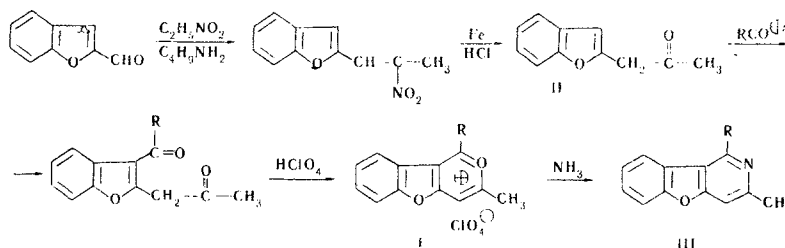


SYNTHESIS OF PYRYLIUM AND PYRIDINIUM
DERIVATIVES OF BENZOFURANV. I. Dulenko, V. I. Volbushko,
and G. N. Dorofeenko

UDC 547.728.812.821

Recently, one of us and co-workers developed a general method for the annexation of pyrylium and pyridinium rings to compounds of the furan [1], thiophene [2], and indole [1] series. In the present communication, we have demonstrated that this method can be successfully used for the synthesis of the heretofore unknown benzofuro[3,2-c]pyrylium salts and the corresponding hard-to-obtain benzofuro[3,2-c]pyridines. We were able to realize the synthesis of 2,9-dialkylbenzofuro[3,2-c]pyrylium perchlorates (I) in good yields (66-75%) by the acylation of 2-acetylbenzofuran (II), obtained by the reduction [3] of the product of the alkaline condensation of 2-formylbenzofuran with nitroethane via the following scheme:



This route was used to obtain the following compounds. 2,9-Dimethylbenzofuro[3,2-c]pyrylium perchlorate was obtained in 66% yield as shiny, colorless crystals with mp 161°C (from glacial acetic acid). Found: C 51.8; H 3.8; Cl 11.7%. $C_{13}H_{11}ClO_6$. Calculated: C 52.3; H 3.7; Cl 11.9%. IR spectrum (cm^{-1}): 1652, 1600, 1582, 1534, 1454, 1404, and 1083. 2-Ethyl-9-methylbenzofuro[3,2-c]pyrylium perchlorate was obtained in 75% yield as cream-colored crystals with mp 148°C (from glacial acetic acid). Found: C 53.5; H 4.4; Cl 10.8%. $C_{14}H_{13}ClO_6$. Calculated: C 53.8; H 4.2; Cl 11.4%. IR spectrum (cm^{-1}): 1650, 1602, 1580, 1530, 1470, 1094.

The benzofuro[3,2-c]pyrylium salts obtained react with alcoholic ammonia to give high yields of the corresponding benzofuro[3,2-c]pyridines (III).

LITERATURE CITED

1. G. N. Dorofeenko, L. V. Dulenko, V. I. Dulenko, and S. V. Krivun, *Zh. Organ. Khim.*, 1, 1171 (1965).
2. G. N. Dorofeenko and L. V. Dulenko, *Khim. Geterotsikl. Soedin.*, 417 (1969).
3. *Organic Syntheses* [Russian translation], Vol. 7, Inostr. Lit., Moscow (1956), p. 44

Donetsk Physical-Organic-Chemistry Branch, Institute of Physical Chemistry, Academy of Sciences of the Ukrainian SSR. Rostov State University, Rostov-on-Don. Translated from *Khimiya Geterotsiklicheskikh Soedinenii*, No. 11, p. 1581, November, 1971. Original article submitted December 17, 1970.

© 1974 Consultants Bureau, a division of Plenum Publishing Corporation, 227 West 17th Street, New York, N. Y. 10011. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission of the publisher. A copy of this article is available from the publisher for \$15.00.