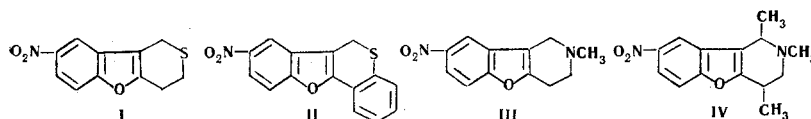


SYNTHESIS OF SOME NEW CONDENSED
BENZOFURAN SYSTEMSL. A. Aksanova, L. M. Sharkova,
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UDC 547.728'83.07

The benzofurano[3,2-c]pyridine and thiopyrano[4,3-b]benzofuran systems have not been described in the literature. We have synthesized some representatives of these systems (I-IV) by cyclization of the 4-nitrophenyl esters of the oximes of the corresponding ketones (V-VIII) via the method previously used for esters of ketoximes of the heterocyclic series [1-4]



Compounds V and VI were cyclized by refluxing (30-50 min) in a 20-25% solution of hydrogen chloride in alcohol, while VII and VIII were cyclized by brief heating with a mixture of sulfuric acid (or boron trifluoride etherate) and acetic acid.

A substance with mp 81-82.5° (hydrochloride, mp 191-192°), which contains an ethoxyl group, is formed when VII is heated in an alcoholic solution of hydrogen chloride; this substance can be converted to III by heating with a mixture of acetic and sulfuric acids. The structures of the condensed heterocycles obtained are confirmed by the UV, IR, and PMR spectra (by comparison with model compounds).

4-Nitrophenyl Ester of Tetrahydro-4-thiopyrone Oxime (V). This had mp 114.5-116° (heptane). Found %: N 11.1; S 13.1. $C_{11}H_{12}N_2O_3S$. Calculated %: N 11.1; S 12.7.

4-Nitrophenyl Ester of 4-Thiochromanone Oxime (VI). This had mp 139-140° (alcohol). Found %: N 9.3; S 10.6. $C_{15}H_{12}N_2O_3S$. Calculated %: N 9.3; S 10.7.

4-Nitrophenyl Ester of 1-Methyl-4-piperidone Oxime (VII). This had mp 93-94° (heptane). Found %: C 58.1; H 6.1; N 17.0. $C_{12}H_{15}N_3O_3$. Calculated %: C 57.8; H 6.1; N 16.9.

4-Nitrophenyl Ester of 1,2,5-Trimethyl-4-piperidone Oxime (VIII). This had mp 97-98° (heptane). Found %: C 61.7; H 7.0; N 15.4. $C_{14}H_{19}N_3O_3$. Calculated %: C 61.5; H 7.0; N 15.4.

8-Nitro-1H-3,4-dihydrothiopyrano[4,3-b]benzofuran (I). This had mp 205.5-206° (alcohol). Found %: N 5.9; S 13.8. $C_{11}H_9NO_3S$. Calculated %: N 6.0; S 13.6.

8-Nitro-6H-benzo[5,6]thiopyrano[4,3-b]benzofuran (II). This had mp 207-209° (absolute alcohol). Found %: N 5.2; S 11.0. $C_{15}H_9NO_3S$. Calculated %: N 4.9; S 11.3.

2-Methyl-8-nitro-1,2,3,4-tetrahydrobenzofurano[3,2-c]pyridine (III). This had mp 145-146° (alcohol). Found %: C 61.9; H 5.3; N 12.0. $C_{12}H_{12}N_2O_3$. Calculated %: C 62.0; H 5.2; N 12.1.

1,2,4-Trimethyl-8-nitro-1,2,3,4-tetrahydrobenzofurano[3,2-c]pyridine (IV). This had mp 111-111.5° (hexane). Found %: C 64.6; H 6.4; N 11. $C_{14}H_{16}N_2O_3$. Calculated %: C 64.6; H 6.2; N 10.8.

Institute of Pharmacology, Academy of Medical Sciences of the USSR, Moscow. Translated from *Khimiya Geterotsiklicheskikh Soedinenii*, No. 11, p. 1581, November, 1970. Original article submitted January 25, 1970.

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