REACTION OF 5-AZACYTOSINE WITH 3-METHYL-1-PHENYL-5-PYRAZOLONE

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1,3-Dimethyl-s-triazine-2,4-(1H,3H)dione is converted into 5-azacytosine in the presence of bases in the reaction with guanidine, into 5-azauracil in the reaction with urea, uracil-5-carboxamide with malonamide, and 5-cyanouracil with cyanamide [1]. 5-Fluorouracil is formed from fluoroacetic acid amide and 1,3-dimethyl-5-azauracil in the presence of lithium diisopropylamide [2].

We found that heating 5-azacytosine (I) and 3-methyl-1-phenyl-5-pyrazolone (II) in boiling butanol results in dipyrazolylmethane (III), identical to a sample of this compound synthesized previously by another method in [3], with a yield of 40-45%.



The mechanism of formation of product III can be represented by the following scheme:



We also obtained dipyrazolylmethane III in heating pyrazolone II with o-formic ester (IV) in ethanol in the presence of triethylamine. At the same time, when these reagents were heated in boiling butanol without triethylamine, no transformations of pyrazolone II were observed.

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It should also be especially noted that the known transformations of 1,3,5-triazine derivatives take place in the presence of strong bases (charge activation of the reagent). The reaction we found is the first example of transformation of 5-azacytosine with an uncharged C-nucleophile.

Di-3-methyl-(1-phenyl-5-oxopyrazolyl-4)methane (III). A. Here 0.224 g (2.0 mmole) of 5-azacytosine I and 0.696 g (4.0 mole) of 3-methyl-1-phenyl-5-pyrazolone II were boiled in 5 ml of butanol for 4 h. The reaction mass was cooled and the precipitated sediment was filtered off and recrystallized from DMF, yielding 0.320 g (45%) of product III.

B. A mixture of 0.3 g (1.74 mmole) of compound II, 1.6 g (10.8 mmole) of *o*-formic ester, and 0.3 ml of triethylamine in 5 ml of ethanol was boiled for 3 h. The reaction mass was cooled to 20-25 °C and neutralized with 10% hydrochloric acid solution to pH 6.5-7. The separated sediment was filtered off and recrystallized from DMF, yielding 0.26 g (42%) of compound III.

The products obtained with methods A and B were identical to a sample of the compound described in [3] according to the data from the IR spectra.

REFERENCES

- 1. W. K. Chung, C. K. Chu, K. A. Watanabe, and J. J. Fox, J. Org. Chem., 44, 3982 (1979).
- 2. W. K. Chung, J. H. Chung, and K. A. Watanabe, J. Heterocycl. Chem., 20, 457 (1983).
- Yu. A. Azev, H. Neunhoeffer, S. Foro, H. J. Lindner, and S. V. Shorshnev, Mendeleev Commun., No. 6, 229 (1995).