NITRO COMPOUNDS IN THE 1,3-DIPOLAR ADDITION REACTION

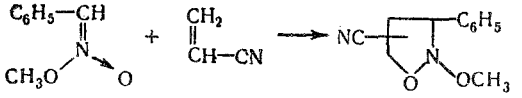
(UDC 547.23)

V. A. Tartakovskii, I. E. Chlenov, S. S. Smagin, and S. S. Novikov

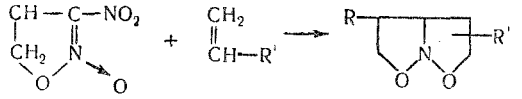
N. D. Zelinskii Institute for Organic Chemistry, Academy of Sciences, USSR

Translated from Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No. 3, pp. 583-584, March, 1964
Original article submitted December 11, 1963

We showed that ethers of the aci-form of nitro compounds react with unsaturated compounds by the 1,3-dipolar addition route. Thus, reaction between the O-methyl ether of phenylnitromethane and acrylonitrile led to N-methoxy-3-phenylnitriol-oxazolidine (m. p. 96°. Found: C 64.93, 65.03; H 5.90, 4.94; N 13.99, 14.21%. $C_{11}H_{12}O_2N_2$. Calculated: C 64.71; H 5.92; N 13.72%).

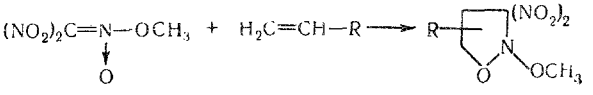


3-Nitrooxazoline-N-oxides, which can be considered as cyclic ethers of aci-nitro compounds, reacted by this scheme to form a new class of heterocyclic compounds – isoxazolizidine derivatives.



R = H, R' = H (m. p. 58-59°. Found: C 37.73, 37.80; H 5.21, 5.15; N 17.06, 17.19%. $C_5H_8O_4N_2$. Calculated: C 37.50 H 5.00; N 17.50%); R = H, R' = $OCOCH_3$ (m. p. 81.5-82.5°. Found: C 38.64, 38.83; H 4.76, 4.72; N 13.08, 12.81%. $C_7H_{10}O_6N_2$. Calculated: C 38.53; H 4.59; N 12.84%), R = CH_3, R' = C_6H_5 (m. p. 129-130°. Found: C 57.27, 57.36; H 5.75, 5.72; N 11.18, 11.41%. $C_{12}H_{14}O_4N_2$. Calculated: C 57.60; H 5.60; N 11.20%); R = C_6H_5, R' = C_6H_5 (m. p. 165-166°. Found: C 65.38, 65.48; H 5.15, 5.02; N 8.96, 8.98%. $C_{17}H_{16}O_4N_2$. Calculated: C 65.45; H 5.13; N 8.98%).

The O-methyl ether of trinitromethane, which we obtained by reaction between trinitromethane and diazomethane, also can undergo the 1,3-addition reaction



R = CH_2Cl (m. p. 43-44°. Found: C 24.92, 24.93; H 3.39, 3.41; Cl 14.71, 14.87%. $C_5H_8O_6N_3$. Calculated: C 24.84; H 3.31; Cl 14.70%); R = C(=O)–OCH_3 (m. p. 51.5-52°. Found: C 28.68, 28.78; H 3.87, 3.72; N 16.50, 16.63%. $C_6H_9O_8N_3$. Calculated: C 28.69; H 3.51; N 16.73%).

The isoxazolidine compounds we obtained are the first examples of substances containing a trivalent nitrogen atom covalently bound to two oxygen atoms.