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FURAZANOBENZOTHIADIAZOLE, AND FUROXANOBENZOTHIADIAZOLE NOVEL HETEROCYCLIC SYSTEMS

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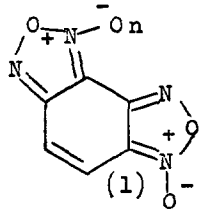
Biological examination in these laboratories of the tricyclic Furazanobenzofuroxan[1] (1,n=0), and Furoxanobenzofuroxan[1] (1, n=1) revealed high Monoamine Oxidase inhibitory, and vasodilatory properties.

The biological action of these, and related heterocycles was investigated in depth, and is reported elsewhere[2,3], however during the course of these studies the two titled novel systems were synthetised and are described in this communication.



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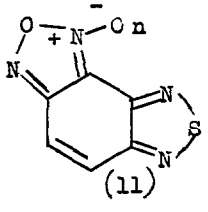

(11)

Furoxanobenzothiadiazole (11, n=1) was synthetised by two independent routes, starting in each case from the appropriately substituted benzothiadiazole (111). Thus 5-nitrobenzothiadiazole[4] (111,X=NO_2,Y=H), derived from 4-nitro-1,2-phenylenediamine (1V,X=NO_2) was aminated with alkaline hydroxylamine according to the procedure of Brizzi et al[5] to yield (111,X=NO_2,Y=NH_2). Oxidative cyclisation of (111,X=NO_2,Y=NH_2) with alkaline sodium hypochlorite afforded the desired compound (11, n=1) in low yield, a result attributed to the low solubility of 4-amino-5-nitrobenzothiadiazole (111,X=NO_2,Y=NH_2) in the oxidative medium.

The alternative route via 5-chloro-4-nitrobenzothiadiazole[6] (111,X=Cl,Y=NO_2) proved to be more rewarding. This compound prepared

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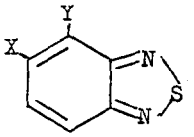
by nitration of 5-chlorobenzothiadiazole (111,X=Cl,Y=H)[7] reacted with sodium azide in DMSO to form the nitroazide (111,X=N_3,Y=H) which at the temperature employed for the replacement (100°C) spontaneously ring closed with loss of nitrogen to yield furoxanobenzothiadiazole (11, n=1).



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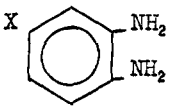

(1V)

The convertion of furoxanobenzothiadiazole (11,n=1) to furazanobenzothiadiazole (11,n=0) was achieved with triethylphosphite.

Both furazanobenzothiadiazole, and furoxanobenzothiadiazole are stable crystaline solids with properties similar to their respective oxygen analogues[3].

References

1. A.J.Boulton, A.C.Gripper-Gray, and A.R.Katritzky, J.Chem.Soc., 1116(1965).
2. A.J.Bolt, M.Edwards, and P.Ghosh, Biochem. Pharmac., submitted for publication
3. Peter B. Ghosh, Barry J. Everitt, and Nickolas B. Hackett, J.Med.Chem., submitted for publication.
4. A.M.Khaletskii, V.G.Pesin, and Chi-Chun Chow, Dokl.Akad.Nauk.SSSR, 106,88(1956).
5. C.Brizzi, D.DalMonte, and E.Sandri, Ann.Chim.(Rome), 54,476(1964).
6. P.Hope, and L.A.Wales, J.Chem.Soc.,(C), 1283(1966).
7. L.S.Efros, and R.M.Levit, Zhur.obshchei Khim., 25,183(1955).