HETEROCYCLES, Vol.9, No.10, 1978

OXIDATION OF REISSERT COMPOUNDS WITH MOLECULAR OXYGEN

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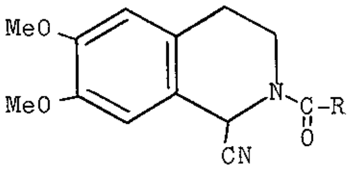
Oxidation of dihydro Reissert compounds (Ia, b) with molecular oxygen under two-phase catalytic system yielded dihydroisocarbostyril (II). However, 6,7-dimethoxyisoquinaldonitrile (IV) was isolated when Reissert compound (III) was similarly oxidised.

Recent publication[1] prompts us to disclose the results of our investigation[2] on the oxidation of Reissert compounds in methylene chloride with molecular oxygen in the presence of triton B (prepared *in situ* from the reaction of benzyltrimethylammonium chloride with 50% aqueous sodium hydroxide).

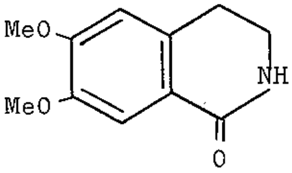
Oxygen was bubbled through the stirred mixture of N-benzoyl-1,2,3,4-tetrahydro-6,7-dimethoxyisoquinaldonitrile (Ia), benzyltrimethylammonium chloride, 50% sodium hydroxide in methylene chloride until tlc showed complete disappearance of starting



I

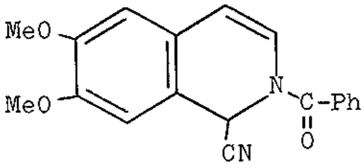
a R = Ph-

b R = -OEt

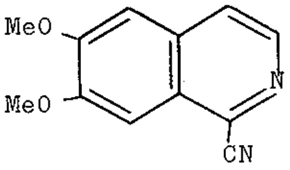


II

dihydro Reissert compound. Work-up of the reaction mixture yielded 3,4-dihydro-6,7-dimethoxyisoquinolone (II), mp 157-158°, in 84% yield after preparative layer chromatography. When dihydro Reissert compound (Ib) was subjected to the same reaction conditions as above, the same dihydroisocarbostyril (II) was isolated in 76% yield after preparative layer chromatography. The conversion provided a very convenient synthesis of dihydroisocarbostyril[3]. It is interesting to note that whereas the normal oxidative decyanation[4] requires reducing agent, no reducing agent is needed for the above reaction. It was recently observed[5] that oxidative decyanation could be carried out without reducing agent.



III



IV

Reissert compounds behave differently in the above reaction from dihydro Reissert compounds. For example, when N-benzoyl-1,2-dihydro-6,7-dimethoxyisoquinaldonitrile (III) was treated with oxygen in the manner described, 6,7-dimethoxyisoquinaldonitrile[6] (IV) was isolated in 62% yield together with benzoic acid (92% yield).

All the Reissert compounds were synthesized by the modified procedure[7].

Acknowledgement: We are grateful to Dr. Jack Cannon of the University of Western Australia for the mass spectral data.

References and Footnotes

1 M. D. Rozwadowska and D. Brózda, Tetrahedron Lett., 1978, 589.

2 This work was taken in part from M. Sc. thesis of Mayuree Chuankamnerdkarn, Mahidol University, 1977.

3 For recent syntheses of dihydroisocarbostyrils, see Y. Tsuda, K. Isobe, J. Toda, and J. Taga, Heterocycles, 1976, **5**, 157 and references cited therein.

4 For example, see K. A. Parker and J. L. Kallmerten, Tetrahedron Lett., 1977, 4557 and references cited therein.

5 Y. Masuyama, Y. Ueno, and M. Okawara, Chem. Lett., 1977, 1439.

6 Compound (IV) has the following physical data: mp 196-197°; nmr ($CDCl_3$) δ 4.08, 4.12 (2s, 2x$OC\underline{H}_3$), 7.20, 7.52 (2s, C-5 and C-8 Ar$\underline{H}$), 7.75, 8.53 (AB system, J = 6 Hz, $\underline{H}C{=}C\underline{H}{-}N{=}$); ms m/e 214 ($M^+$, 100%).

7 S. Ruchirawat, N. Phadungkul, M. Chuankamnerdkarn, and C. Thebtaranonth, Heterocycles, 1977, 6, 43.

Received, 5th June, 1978