

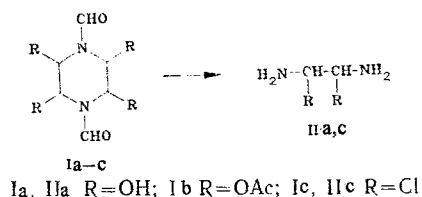
ACIDIC FISSION OF 1,4-DIFORMYL-2,3,5,6-TETRA SUBSTITUTED  
PIPERAZINES

V. V. Nurgatin, B. M. Ginzburg, V. I. Kovalenko,  
and G. A. Marchenko

UDC 547.861.6'415.1

The mild removal of the N-formyl group by the action of hydrochloric acid is known from [1].

With the aim of obtaining unknown 2,3,5,6-tetra substituted piperazines by the deformylation of their 1,4-diformyl derivatives (I) [2] we have studied the behavior of the latter in hydrochloric acid and have found that together with the expected deformylation there also occurred a destruction of the piperazine ring with the formation of the hydrochloride salts of 1,2-di-substituted ethylenediamines (II).



Thus on treatment of substances (Ia) and (Ib) with concentrated hydrochloric acid for 72 and 24 h respectively at 20°C compound (IIa) dihydrochloride was formed in yields of 35 and 50% having decomposition temperature 132-133°C. IR spectrum (mull in Nujol and in fluorinated vaseline oil): 3070, 2610, 1590 (NH<sub>3</sub><sup>+</sup>), 3620, 1290, 1100 cm<sup>-1</sup> (OH).

Diamine (IIc) dihydrochloride was obtained in 50% yield having decomposition temperature 138°C from compound (Ic) by the action of concentrated hydrochloric acid for 24 h at 20°C. IR spectrum (mull in Nujol and in fluorinated vaseline oil): 3100, 2590, 1610 (NH<sub>3</sub><sup>+</sup>), 740 cm<sup>-1</sup> (Cl).

The data of elemental analysis for C, H, N, and Cl corresponded to the calculated values for all the obtained compounds.

The described conversion, fission of C-N bonds of the piperazine ring, is apparently explained by the instability in acid media of deformylated compound (I), which decomposed in a similar manner to α-hydroxy- [3] and α-haloamines [4] with the formation of the salt of the corresponding amine and an aldehyde. A more profound destruction to ammonium salts is possible, confirmation of which is the quantitative formation of ammonium perchlorate from compound (IIa) dihydrochloride in 42% hydrochloric acid at 20°C.

LITERATURE CITED

1. J. C. Sheehan and D. H. Yang, *J. Am. Chem. Soc.*, **80**, 1154 (1958).
2. A. C. Currie, A. H. Dinwoodie, G. Fort, and J. M. C. Thompson, *J. Chem. Soc.*, No. 6, 491 (1967).
3. A. Kawasaki and Y. Ogata, *Fac. Eng. Nagoya Univ.*, **19**, No. 1, p. 1 (1967) *Chem. Abstr.*, **69**, 58669 (1968).
4. H. Böhme, E. Mundlos, and O. E. Herboth, *Chem. Ber.*, **90**, 2033 (1957).

Translated from *Khimiya Geterotsiklicheskikh Soedinenii*, No. 9, pp. 1265-1266, September, 1985. Original article submitted December 26, 1984; revision submitted February 26, 1985.