

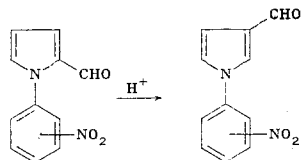
ACIDIC ISOMERIZATION OF 2-FORMYLPYRROLES

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It is known [1] that the acyl group in 2-acylindoles migrates from the 2 position to the 3 position under the influence of strong acids.

We have observed that this sort of isomerization also occurs in the pyrrole series. We found that 1-(p- and m-nitrophenyl)-3-formylpyrroles are formed in 55-60% yields when 1-(p- and m-nitrophenyl)-2-formylpyrroles [2] are heated with polyphosphoric acid (PPA) at 80°C for 3-4 h.



Chromatographic separation of the reaction mixture showed that the starting isomeric formylpyrrole is always present. More prolonged heating and a higher temperature promote resinification, which hinders purification of the reaction products.

This method was used to obtain 1-(p-nitrophenyl)-3-formylpyrrole with mp 142-143°C. UV spectrum: λ_{\max} 324 nm. IR spectrum (KBr): 1675 (C=O); 1355 and 1520 cm^{-1} (NO₂). We also used this procedure to obtain 1-(m-nitrophenyl)-3-formylpyrrole with mp 154-155°C. UV spectrum: λ_{\max} 280 nm. IR spectrum (KBr): 1680 (C=O); 1360 and 1535 cm^{-1} (NO₂). The PMR spectra (in DMSO) of the two compounds were identical, except for the signals of the nitrophenyl ring: 6.78 (4-H), 7.73 (5-H), 8.43 (2-H), and 9.82 ppm (CHO). The results of elementary analysis of the compounds obtained were in agreement with the calculated values.

Heating of the 3-formylpyrroles with PPA under the conditions indicated above led only to resinification, and migration of the formyl group from the 3 position to the 2 position was not observed.

It may be assumed that the isomerization of 2-formylpyrroles occurs via intramolecular electrophilic attack by the protonated carbonyl group on the adjacent 3 position.

LITERATURE CITED

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2. K. G. Lewis and C. E. Malquaney, *Tetrahedron*, **33**, 463 (1977).

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