REACTION OF PYRAZINE WITH INDOLES IN ACETIC ANHYDRIDE

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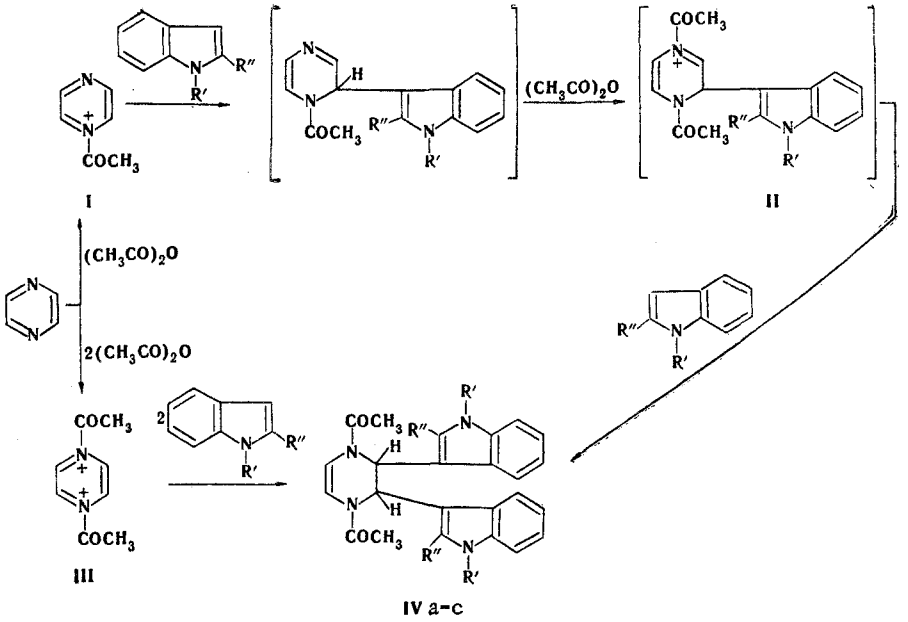
We have obtained 1,4-diacetyl-2,3-di(3-indolyl)-1,2,3,4-tetrahydropyrazines (IV) by refluxing pyrazine with indoles in acetic anhydride. The 1,4-diacetylpyrazinium salt, which adds two molecules of indole, is evidently formed under the given conditions (120°C), or else indole adds successively to the intermediately formed acetyl salts I and II.

The following IV were obtained {R' and R'', yields in percent, melting points in degrees centrigrade(solvent), and R_f values [thin-layer chromatography on Al_2O_3 in a chloroform–benzene–hexane–methanol system (30:6:1:1)] given}: a) H, H, 49, 320-322 (from dimethylformamide), and 0.76; b) H, CH_3, 50, 308-310 (from dioxane), and 0.65; c) CH_3, H, 54, 268-270 (from n-butanol), and 0.42.

Bands of stretching vibrations at 1640-1650 (CO), 3390 (NH) (this band is absent in the spectrum of IVc), and 1610-1630 cm^{-1} (C=C) are observed in the IR spectra of IV. The high-resolution mass spectrum confirmed the structure and empirical composition of the molecular ion of IV, as well as the compositions of the principal fragment ions: M^+, $(M-COCH_2)^+$, $(M-2COCH_2)^+$, $(M-indolyl)^+$, etc.



The compositions of IV were also confirmed by the results of elementary analysis. The structures of IVa-c were confirmed by positive tests for the presence of a C=C bond, an indole ring (with Erlich's reagent), and an acetyl residue in the molecule. We are currently conducting a more thorough study of the three-dimensional structure of IV; the results will be published separately.

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