## LETTERS TO THE EDITOR

BINUCLEOPHILIC ADDITION TO 1,8-NAPHTHYRIDINE UNDER

## HETARYLATION CONDITIONS

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The reactions of nucleophiles with 1,8-naphthyridines in the presence of acyl halides lead to monoaddition products [1, 2].

We have found that products of both mono- and diaddition to both pyridine rings are formed, depending on the reaction conditions. Thus we obtained 1-benzoy1-2-(3-indoly1)-1,2-dihydro-1,8-naphthyridine (Ia), with mp 204-205°C, in 32% yield in the reaction of 1,8naphthyridine with indole in the presence of benzoy1 chloride at room temperature, whereas we obtained IIa, with mp 194-195°C, in 30% yield when the reaction was carried out at 80-100°C.



1-Benzoy1-2,7-bis(2-methy1-3-indoly1)-1,2,7,8-tetrahydro-1,8-naphthyridine (IIb), with mp 240-241°C, was obtained in 20% yield by the same method.

The individuality of the compounds was confirmed by thin-layer chromatography on aluminum oxide. The high-resolution mass spectra confirmed the structures and empirical compositions of the molecular and fragment ions. For example, the following m/z values (relative intensities in percent) were observed for IIb:  $M^+$  496 (21),  $[M - C_6H_5CO]^+$  391 (100), 261 (17), etc. Bands of vibrations at 1590-1640 cm<sup>-1</sup> (vCO) were observed in the IR spectra of I and IIa,b, and intense bands at 3390 and 3280 cm<sup>-1</sup> (vNH) were also observed for IIa,b; the latter band was absent in the IR spectrum of Ia, which contained only the band at 3390 cm<sup>-1</sup> (indole vNH). The results of elementary analysis confirmed the empirical formulas of the substances obtained.

## LITERATURE CITED

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