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LETTERS TO THE EDITOR

Dedicated to V. F. Mironov on His 60th Anniversary

Reactions of Pyridoxal with Aromatic Carboxylic Acids in Alcoholic Medium

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Abstract—Reactions of pyridoxal with benzoic acid and its derivatives in alcoholic medium afforded alkoxyfuropyridinium salts with potential biological activity.

Keywords: pyridoxal, benzoic acid, alkoxyfuropyridines

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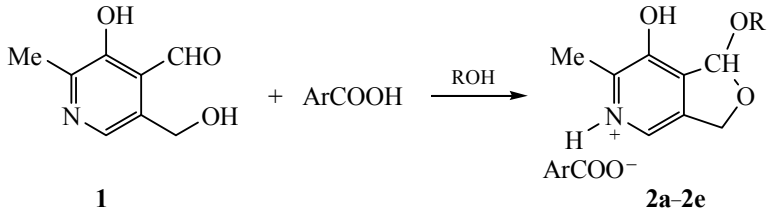
Vitamin B_6 including pyridoxal [3-hydroxy-5-(hydroxymethyl)-2-methylpyridin-4-aldehyde] plays an important role in the vital activity of living organisms [1–6]. The mechanism of its action involves conversion into a catalytically active (coenzyme) form such as pyridoxal-5-phosphate. Catalytic activity of pyridoxal-5-phosphate is based on the ability of its formyl group to form azomethine when reacting with amino acids. At the same time, the presence of a nitrogen atom in the pyridoxal molecule makes possible the formation of onium salts on its basis. The only salt form of pyridoxal is hydrochloride. In this regard, we attempted to obtain onium salts with the use of aromatic carboxylic acids. Surprisingly, the reactions of pyridoxal **1** with benzoic acid and its derivatives in alcohol solution led to the formation of furopyridinum salts **2a**–**2e**, which contain an alkoxy group of the alcohol (Scheme 1).

The structure of the compounds obtained was confirmed by IR and NMR spectra. In the ^{1}H NMR spectra, the protons of endocyclic methylene group appeared as two doublets with spin-spin coupling constants of 12.9–13.1 Hz. The methine proton of the furan ring was detected as a singlet signal in the range of 4.90–4.93 ppm. It should also be noted that the proton C^6H of the pyridine ring was slightly shifted to the weak-field region (7.93–7.94 ppm) compared to

Scheme 1.



1 **2a**–**2e**

Ar = Ph, R = Me (**2a**); Ar = Ph, R = Et (**2b**); Ar = Ph, R = *i*-Pr (**2c**); Ar = 2-$NO_2C_6H_4$, R = Et (**2d**); Ar = 3,5-$(NO_2)_2C_6H_3$, R = Et (**2e**).