

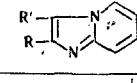
USE OF THE KING METHOD FOR THE SYNTHESIS OF IMIDAZO[1,2-*a*]PYRIDINES

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We have established that 2-substituted and 2,3-disubstituted imidazo[1,2-*a*]pyridines can be obtained directly from ketones by a combination of two methods – the King method [1], used for the preparation of β -ketoalkylpyridinium iodides from ketones, iodine, and pyridine; and the Chichibabin method [2], in which the β -ketoalkyl-2-aminopyridinium salts usually obtained from α -halo ketones and 2-aminopyridine are intermediates for the subsequent cyclization to imidazo[1,2-*a*]pyridines.

TABLE 1. Characteristics of the Compounds Obtained

Comp.			Mp, °C		<i>R_f</i> ^a	UV spectrum in alcohol, λ_{\max} nm (log ϵ)	Empirical formula	Yield, tech. product, %
	R	R'	by new method	literature data				
I	4-Bromophenyl	H	215–7 ^b	218 ³	0,70	250, 314, 324 (4,73; 4,12; 4,13)	C ₁₃ H ₉ BrN ₂	76
II	4-Nitrophenyl	H	258–60 ^c	261 ⁴	0,83	225, 276, 345 (4,60; 4,37; 4,41)	C ₁₃ H ₉ N ₃ O ₂	83
III	3-Nitrophenyl	H	203–4 ^c	205 ⁴	0,73	245, 312 (4,76; 4,08)	C ₁₃ H ₉ N ₃ O ₂	90
IV	Phenyl	H	132–3 ^d	135–136 ²	0,68	245, 323 (4,89; 4,26)	C ₁₃ H ₁₀ N ₂	92
V	Phenyl	CH ₃	157 ^e	156–157 ⁴	0,66	240, 320 (4,57; 3,88)	C ₁₄ H ₁₂ N ₂	7 ^f
VI	2-Furyl	H	110–2 ^d	110 ⁵	0,75	250, 317 (4,47; 3,99)	C ₁₁ H ₈ N ₂ O	26 ^f
VII	2-Thienyl	H	138–9 ^d	137–138 ⁶	0,75	255, 330 (4,46; 4,17)	C ₁₁ H ₈ N ₂ S	5 ^f

^aPlates of the "Silufol" UV₂₅₄ type, ethanol–benzene system (1:2).

^bFrom alcohol.

^cFrom pyridine.

^dFrom n-octane.

^eObtained for the first time by the Chichibabin method in 4% yield (extracted with n-octane).

^fPurified by extraction with hot n-octane or petroleum ether.

The synthesis was accomplished by refluxing 0.1 mole of the ketone with 0.1 mole of iodine and 0.2 mole of 2-aminopyridine in dry benzene or chloroform for 1 h, separation of the precipitate, dilution of it with 500 ml of water, neutralization by heating with sodium bicarbonate, and separation of the imidazopyridine derivative as a precipitate (I–IV) or a resinous product (V–VIII). The identity of the majority of the products obtained by the new method and the Chichibabin method was proved by means of thin-layer chromatography and UV spectroscopy (Table 1). The C, H, and N content, which coincided with the calculated values within the limits of analytical error, was determined for all of the compounds.

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