CARBONYL DERIVATIVES OF 2-ARYLTHIOPHENES

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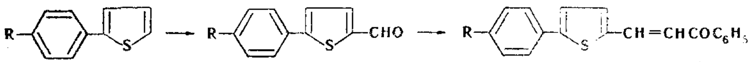
The reaction of 4-R-benzenediazonium chlorides (R = H, CH_3, CH_3O, Cl, Br) with thiophene (Gomberg reaction) has given 2-arylthiophenes, which have been converted by Vilsmeier formylation into 5-arylthiophene-2-carbaldehydes (Table 1), as described by Demerseman et al. [1]. The latter, on condensation (methanolic solution of caustic soda, 45–55°C) with acetophenone has given chalcone analogs (Table 2):



I–V

VI–X

Previously, 3-(5-phenyl-2-thienyl)-1-phenylprop-2-en-1-one (VI) has been described [2] with a yield of 51% and mp 110-112°C. The structure of the compounds obtained has been confirmed by UV and IR spectroscopy. The electronic spectra showed that the thiophene ring is a better transmitter of electronic influences than a 1,4-phenylene system.

TABLE 1. 5-Arylthiophene-2-carbaldehydes (I–V)

Compound	R	Mp, °C	Empirical formula	S, % found		S, % calculated	Yield, %	λ_{max}, nm (log ε) (in ethanol)	
I	H^1	90	$C_{11}H_8OS$	—	—	—	87	231 (3,96)	332 (4,33)
II	CH_3	93	$C_{12}H_{10}OS$	15,9	16,3	15,8	83	235 (4,00)	335 (4,37)
III	CH_3O	116	$C_{12}H_{10}O_2S$	14,9	15,0	14,7	85	241 (4,00)	350 (4,30)
IV	Cl	87	$C_{12}H_{10}ClOS$	14,1	14,2	14,4	81	235 (4,01)	331 (4,34)
V	Br	114,	$C_{12}H_{10}BrOS$	11,8	12,1	12,0	80	237 (4,00)	331 (4,38)

TABLE 2. 3-(5-Aryl-2-thienyl)-1-phenylprop-2-en-1-ones (VI–X)

Compound	R	Mp, °C	Empirical formula	S, % found		S, % calculated	Yield, %	λ_{max}, nm (log ε) (in ethanol)	
VI	H	122	$C_{19}H_{14}OS$	—	—	—	98	270 (4,12)	378 (4,48)
VII	CH_3	132	$C_{20}H_{16}OS$	10,7	10,6	10,5	97	273 (4,14)	387 (4,47)
VIII	CH_3O	149	$C_{20}H_{16}O_2S$	10,2	10,3	10,0	98	282 (4,16)	397 (4,43)
IX	Cl	153	$C_{19}H_{13}ClOS$	10,0	10,1	9,9	99	272 (4,13)	382 (4,50)
X	Br	166	$C_{19}H_{13}BrOS$	8,7	8,8	8,7	98	268 (4,52)	381 (4,65)

LITERATURE CITED

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2. A. E. Lipkin, N. I. Putokhin, and S. I. Borisov, Khim. Geterotsikl. Soedin., 1021 (1967).

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