# REACTION OF 5-ARYL-2-METHOXYCARBONYLMETHYLENE-2,3-DIHYDROFURAN-3-ONES WITH BENZOPHENONE HYDRAZONE

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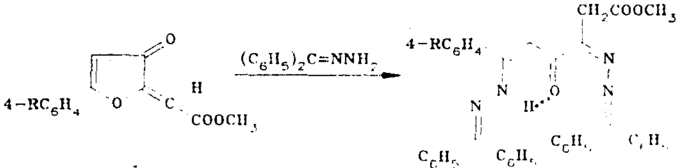
It is known that 5-aryl-2-methoxycarbonylmethylene-2,3-dihydrofuran-3-ones I react with aromatic amines or hydrazine to give cyclic products of nucleophilic addition, viz., derivatives of 2-hydroxy-2,3-dihydropyrrol-3-one [1] or 1,2,3,4-tetrahydropyridazino[4,3-c]pyridazin-3-one [2]. As a result of the reaction of Ia, b with benzophenone hydrazone in ethanol we unexpectedly obtained methyl 6-aryl-6-diphenylmethylenehydrazino-3,4-dioxo-5-hexenoate 3-diphenylmethylenehydrazones IIa, b in 56-61% yields.



I a,b

I, IIa R=H; b R=Cl

II a,b

The presence of an ion peak with a mass number of 325 in the mass spectrum of IIa and the absence of splitting of the signal of the $CH_2$ group in the PMR spectrum provide evidence that the compound cannot have the isomeric 2-hydroxy-1-diphenylmethyleneamino-2-methoxycarbonylmethyl-5-phenyl-2,3-dihydropyrrol-3-one 3-diphenylmethylenehydrazone structure.

Compounds II are evidently formed as a result of nucleophilic addition of the hydrazone due to attack at the electrophilic center at the $C_{(5)}$ atom of furanones I with the subsequent reaction of a second molecule of the hydrazone with the β-keto ester fragment of the intermediate methyl 6-aryl-6-diphenylmethylenehydrazino-3,4-dioxo-5-hexenoates.

A 3.92-g (0.02 mole) sample of benzophenone hydrazone was added to a solution of 0.01 mole of 5-aryl-2-methoxycarbonylmethylene-2,3-dihydrofuran-3-ones Ia, b [3] in 200 ml of ethanol, and the mixture was refluxed for 15-20 min. The precipitate was removed by filtration and crystallized from acetonitrile or chloroform–hexane (1:1).

**Compound IIa.** This compound was obtained in 61% yield and had mp 156-157°C (decomp.). IR spectrum (KBr): 1726 (C=O, w, ester); 1605, 1555-1583 cm$^{-1}$ ($C_{(4)}=O$, $C_{(5)}=C_{(6)}$, C=N). PMR spectrum ($d_6$-DMSO): 3.42 (3H, s, $OCH_3$), 3.53 (2H, s, $CH_2$), 5.78 (1H, s, CH), 7.17-7.72 (25H, m, $5C_6H_5$), 12.81 ppm (1H, br.s, NH). UV spectrum (ethanol), $\lambda_{max}$ (log ε): 280 (4.31), 432 nm (4.83). Mass spectrum, m/z (I, % relative to the maximum peak): 604 (2) $M^+$, 410 (5) $[M-(C_6H_5)_2CN_2]^+$, 325 (6) $[(C_6H_5)_2C=NNH-C(C_6H_5)=CH-C\equiv O]^+$, 283 (11) $[(C_6H_5)_2C=N-N\equiv C-C_6H_5]^+$, 196 (16) $[(C_6H_5)_2C=NNH_2]^+$, 180 (100) $[(C_6H_5)_2C=N]^+$, 104 (38) $[C_6H_5C\equiv NH]^+$, 103 (13) $[C_6H_5-C\equiv N]^+$. 77 (43) $[C_6H_5]^+$.

**Compound IIb.** This compound was obtained in 56% yield and had mp 161-162°C (decomp.). IR spectrum (KBr): 1735 (C=O, w, ester); 1570-1585, 1535-1550 cm$^{-1}$ ($C_{(4)}=O$, $C_{(5)}=C_{(6)}$, C=N). PMR spectrum ($d_6$-DMSO): 3.43 (3H, s, $OCH_3$), 3.53 (2H, s, $CH_2$), 5.75 (1H, s, CH), 7.15-7.67 (24H, m, $4C_6H_5$, $C_6H_4$), 12.78 ppm (1H, br.s, NH).

## LITERATURE CITED

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