DIPHTHALOLYLPYRROLIDINES FROM 2-ARYLIDENE-1,3-INDANDIONES AND PHENYL AZIDE

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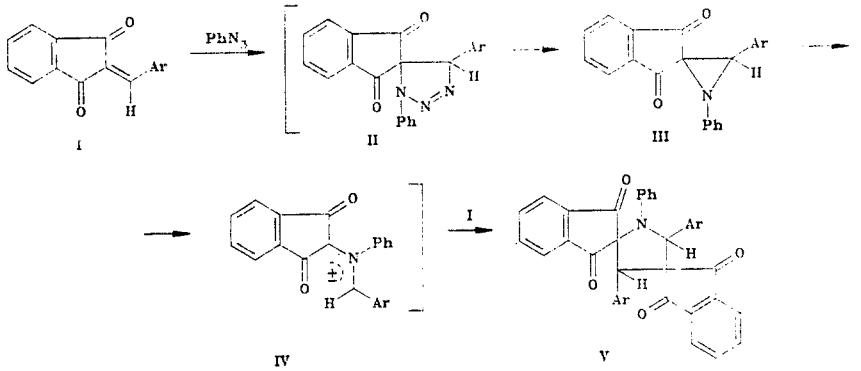
UDC 547.743.1'749'572.3

Azides frequently react with unsaturated compounds to give mixtures of aziridines and azomethines [1]. We have previously found that reaction of NaN_3 with 2-arylidene-1,3-indandiones (I) in the system acetic acid–dimethyl sulfoxide affords aminonaphthoquinones, which are the tautomerization products of the initially formed imines [2]. However, on boiling the α,β-unsaturated ketones (I) with excess PhN_3 in benzene, the sole products are the N-phenyl-2,4-diaryl-3,3,5,5-diphthaloylpyrrolidines (V). The intermediate product (the unstable triazoline (II)) is converted into the same aziridine (III), which undergoes electrocyclic ring cleavage to the azomethinylid (IV). It was not possible to isolate the intermediate (III), the reaction mixture containing only the reactants and pyrrolidines (V). The latter are evidently formed by the regio- and stereospecific 1,3-dipolar cycloaddition of the ylid (IV) to the unreacted olefin (I). This reactions also affords evidence for the existence of novel 1,3-dipoles containing the 1,3-indanediol moiety.



I, V Ar=4-RC_6H_4 a R=H; b R=Me; c R=Cl

The following compounds were obtained: (Va) [mp 228°C (decomp., from chloroform), IR spectrum (Nujol mull): 1723, 1752 cm^{-1} (C=O). PMR spectrum ($CDCl_3$): 4.80 (s, 1H, 4-H); 5.83 (s, 1H, 2-H); 6.18-8.07 ppm (m, 23H, arom)]. (Vb) [mp 241°C (decomp., from chloroform). IR spectrum (Nujol mull): 1723, 1725 cm^{-1} (C=O). PMR spectrum ($CDCl_3$): 1.91 (s, 3H, Me); 2.22 (s, 3H, Me); 4.75 (s, 1H, 4-H); 5.75 (s, 1H, 2-H); 6.10-7.95 ppm (m, 21H, arom)]. (Vc) [mp 231°C (decomp., from chloroform). IR spectrum (Nujol mull): 1719, 1750 cm^{-1} (C=O). PMR spectrum ($CDCl_3$): 4.78 (s, 1H, 4-H); 5.86 (s, 1H, 2-H); 6.28-8.05 ppm (m, 21H, atom.)].

The elemental analyses of the pyrrolidines (Va–c) were in agreement with the calculated values.

LITERATURE CITED

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 0009-3122/89/2502-0226$12.50