INDENO[2,3-e]{[2,3-g],[3,2-f]}INDOLIZINES

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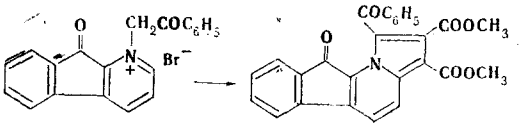
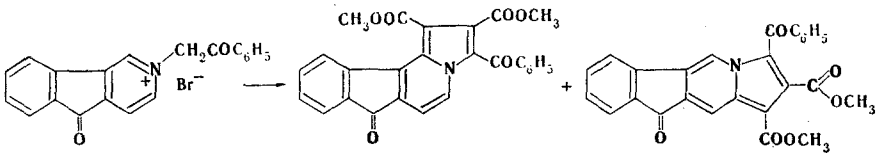
Of the seven theoretically possible isomeric (with respect to the position of the nitrogen atom and the order of fusion of the rings) indenoindolizines, three, viz., substituted indeno[1,2-d] {[1,2-g],[2,3-f]} indolizines, which were obtained from quaternary salts of 4- and 2-azafluorenes, have been described [1, 2].

For the synthesis of three previously unknown indenoindolizines we used quaternary salts of 1- and 3-azafluorenones with ω-bromoacetophenone, which were subjected to reaction with dimethyl acetylenedicarboxylate (1,3-dipolar cycloaddition). In the first case the reaction proceeds unambiguously to give 10-oxo-1-benzoyl-2,3-dicarbomethoxyindeno[2,3-e]-indolizine (in 5% yield) in the form of red crystals with mp 222-224°C (from acetone). PMR spectrum (d_6-DMSO): 3.47 (s, CH_3); 3.82 (s, CH_3); 7.80 and 8.45 ppm (AB system, J = 8.5 Hz, 4-H and 5-H).



As expected, a mixture of both indenoindolizines, which are isomeric with respect to the order of fusion of the rings, is formed in the second case. Both isomers were isolated by chromatography. 6-Oxo-3-benzoyl-1,2-dicarbomethoxyindeno[2,3-g]indolizine (in 21% yield) was obtained in the form of red crystals with mp 195-197°C (from chloroform). PMR spectrum ($CDCl_3$): 3.21 (s, CH_3); 3.90 (s, CH_3); 9.1 and 7.72 ppm (d, J = 6.5 Hz, 4-H and 5-H). 5-Oxo-1-benzoyl-2,3-dicarbomethoxyindeno[3,2-f]indolizine (in 26% yield) was obtained in the form of yellow crystals with mp 213-214°C (from chloroform). Its linear structure is confirmed by the presence of a singlet signal (1H, 10-H) with weak splitting ($J_{4,10} \cong$ 1.0 Hz) at 8.52 ppm in the PMR spectrum.



All three indenoindolizines were characterized by the results of elementary analysis and data from the UV and IR spectra. Intense molecular-ion peaks are observed in their mass spectra.

LITERATURE CITED

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