LETTERS TO THE EDITOR

N-ALLENYLATION OF PYRROLES BY 2,3-DICHLORO-1-PROPENE

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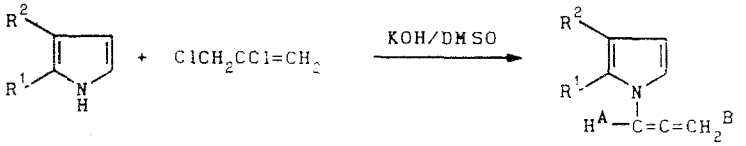
The previously unknown N-allenylpyrroles I and II can be obtained in the KOH/DMSO system with high selectivity from pyrroles and the accessible 2,3-dichloro-1-propene (readily obtainable from 1,2,3-trichloropropane — a side product in the manufacture of epichlorohydrin).



I R^1-R^2 = $(CH_2)_4$; II R^1 = Ph, R^2=H

A 4.16-g (37.5 mmole) sample of 2,3-dichloro-1-propene was added dropwise (in the course of 10 min) to a mixture of the pyrrole (25 mmole) and 8.4 g (150 mmole) of calcined KOH (500°C, 4 h) in 50 ml of DMSO containing 0.2% water (the reaction was exothermic with spontaneous heating to 40°C, 10 min), after which the mixture was heated at 40°C for 10 min and then poured into 100 ml of water. The aqueous mixture was extracted with ether, and the ether extracts were washed with water and dried with $MgSO_4$. The ether was removed, and the residue was chromatographed (Al_2O_3, hexane) to give the pure N-propadienylpyrrole. The results of elementary analysis for C, H, and N were in agreement with the calculated values.

1-Propadienyl-4,5,6,7-tetrahydroindole (I, $C_{11}H_{13}N$). This compound had n_D^{20} 1.5790. PMR spectrum ($CDCl_3$): 6.76 (1H, t, A-H), 5.42 (2H, d, B-H), $^4J_{AB}$ = 6.6 Hz; 6.62 (1H, d, 2-H); 5.97 (1H, d, 3-H); 2.50 (4H, m, 4,7-CH_2); 1.74 ppm (4H, m, 5,6-CH_2). IR spectrum: 1960 (C=C=C); 1485, 1370 (pyrrole ring); 1305 (C—N); 708 cm^{-1} (δ, pyrrole ring).

1-Propadienyl-2-phenylpyrrole (II, $C_{13}H_{11}N$). This compound had n_D^{20} 1.6370. PMR spectrum ($CDCl_3$): 6.94 (1H, t, A-H), 5.43 (2H, d, B-H), $^4J_{AB}$ = 6.6 Hz; 6.94 (1H, t, 5-H); 6.26 (2H, d, 3-H, 4-H); 7.36 ppm (5H, m, Ph). IR spectrum: 1950 (C=C=C); 1604, 1500 (Ph); 1475, 1380 (pyrrole ring); 1314 (C—N); 720, 704 cm^{-1} (δ, pyrrole ring).

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