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CATALYTIC REDUCTION OF HYDROACRIDINIUM SALTS

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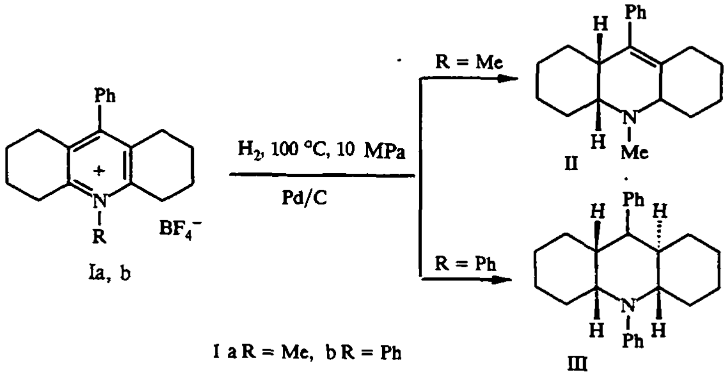
On the example of 10-methyl-9-phenyl-*sym*-octahydroacridinium tetrafluoroborate (Ia), we previously showed that catalytic reduction of its heterocycle takes place incompletely, but with formation of dodecahydroacridine (II) [1]. There is no other published information on catalytic reduction of acridinium salts and their isologs. In continuing this research, we unexpectedly isolated the product of exhaustive reduction of heterocycle (III) in hydrogenation of 9,10-diphenyl-substituted salt Ib. ^{13}C NMR spectroscopy showed that the latter has a *cis-anti-trans* configuration:



The results obtained allowed predicting synthesis of 9-Ar-10-R (Me, Ar)-perhydro- or dodecahydroacridines as a function of the nature of the substituent at the nitrogen atom.

Salts I were obtained with yields of 60-66% in the reaction of 9-phenyl-*sym*-octahydroxanthylium tetrafluoroborate with methylamine and aniline, respectively, by the method in [2].

9,10-Diphenyl-*sym*-octahydroacridinium Tetrafluoroborate (II, $C_{25}H_{26}NBF_4$). Yield of 66%. mp = 120-121°C (ethanol). ^1H NMR spectrum ($CDCl_3$): 2.06 (4H, t, 1- and 8-H); 2.86, (8H, m, 2-, 3-, 6-, and 7-H); 3.42 (4H, t, 4- and 5-H); 7.45 and 7.83 (10H, two m, H_{arom}).

***cis-anti-trans*-9-10-Diphenylperhydroacridine (III, $C_{25}H_{31}N$).** An autoclave was filled with 0.07 mole of salt I, 0.07 mole of aniline, 70 ml of abs. ethanol, and 0.5 g of 10% Pd/C. The mixture was held at 100°C for 6 h in an atmosphere of hydrogen. The initial hydrogen pressure was 10 MPa. The catalyst was then filtered off, and colorless crystals of product III precipitated from the filtrate on standing. Yield of 58%. mp = 134-136°C (standard). ^{13}C NMR spectrum ($CDCl_3$): 21.39 ($C_{(1)}$, t); 25.65 ($C_{(2)}$, t); 20.26 ($C_{(3)}$, t); 30.75 ($C_{(4)}$, t); 62.11 ($C_{(4a)}$, d); 32.34 ($C_{(5)}$, t); 26.57 ($C_{(6)}$, t); 25.92 ($C_{(7)}$, t); 30.37 ($C_{(8)}$, t); 39.46 ($C_{(8a)}$, d); 53.70 ($C_{(9)}$, d); 44.53 ($C_{(9a)}$, d); 69.12 ppm ($C_{(10a)}$, d).

The data from elemental analysis corresponded to the calculated data.

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