5-(o-Hydroxyphenyl)-3-methyl-4-phenyl-1,2,4-oxadiazolium Perchlorate (IIc, $C_{15}H_{13}ClN_2O_6$). This compound had mp 188-190°C (from AcOH). PMR spectrum (CD_3CN): 2.40 (3H, s, CH_3), 6.76-7.86 (9H, m, C_6H_4 and C_6H_5), 8.90 ppm (1H, s, OH). The yield was 41%.

5-(o-Hydroxyphenyl)-2,3-dimethyl-1,2,4-oxadiazolium Perchlorate (IV, $C_{10}H_{11}ClN_2O_6$). This compound had mp 257-258°C (from AcOH). PMR spectrum (CF_3COOH): 2.57 (3H, s, CH_3), 4.1 (3H, s, N—CH_3), 6.58-7.83 ppm (4H, m, C_6H_4). The yield was 47%.

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SYNTHESIS OF 5-AMINO-3*a*,4-DICYANO-2,3,3*a*,6*a*-TETRAHYDROFURO[2,3-b]PYRROLES

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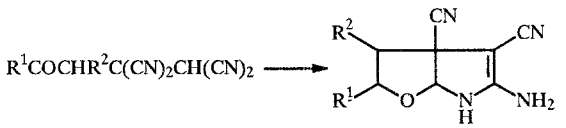
We have observed that substituted 2,3,3*a*,6*a*-tetrahydrofuro[2,3-b]pyrroles IIa-d are formed in the reduction of $\beta,\beta,\gamma,\gamma$-tetracyano ketones with sodium borohydride in water at room temperature.



I a-d II a-d

I, II a R^1=CH_3, R^2=H; b R^1=CH_3, R^2=C_3H_7; c R^1=C_6H_5, R^2=H; d R^1=C_4H_9, R^2=H

A solution of 0.1 mole of $NaBH_4$ in 20 ml of water was added in portions with water cooling to a suspension of 0.05 mole of 4,4,5,5-tetracyano-2-pentanone in 30 ml of water, after which the mixture was stirred for 30-40 min. It was then neutralized with dilute hydrochloric acid, and the precipitate was removed by filtration, washed with water, dried, and recrystallized from isopropyl alcohol to give IIa ($C_9H_{10}N_4O$), with mp 176-178°C, in 67% yield. IR spectrum (here and subsequently, suspension in mineral oil): 3200-3450; 1650 (NH_2); 2250, 2180 (CN); 1590 cm^{-1} (C=C). The structure of IIa was established by x-ray diffraction analysis.

The following compounds were similarly obtained [the compound, empirical formula, melting point (°C), yield (%), and principal bands in the IR spectrum are presented]: IIb, $C_{12}H_{16}N_4O$, 204-205, 68, 3185-3450, 1645 (NH_2), 2185, 2250 (CN), 1590 (C=C); IIc, $C_{14}H_{12}N_4O$, 208-210, 50, 3200-3430, 1650 (NH_2), 2190, 2250 (CN), 1590 (C=C); IId, $C_{12}H_{16}N_4O$, 198-200, 57, 3200-3450, 1645 (NH_2), 2180, 2250 (CN), 1590 (C=C).

^{13}C NMR spectrum of 5-amino-2-phenyl-3*a*,4-dicyano-2,3,3*a*,6*a*-tetrahydrofuro[2,3-b]pyrrole (data for a second diastereomer are presented in parentheses): C(1) 161.65 (161.33), C(2) 49.89, C(3) 119.09, C(4) 49.29, C(5) 120.68 (119.93), C(6) 92.85 (93.65), C(7) 45.85 (45.11), C(8) 78.83 (78.29), C(9) 138.43 (140.05), C(10) 128.26 (127.48), C(11) 126.21 (125.46).

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Translated from Khimiya Geterotsiklicheskikh Soedinenii, No. 2, p. 282, February, 1992. Original article submitted January 24, 1991.

0009-3122/92/2802-0237$12.50