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ARYLATION OF THE 2,3'-BIQUINOLYL DIANION BY 1-ALKYLBENZIMIDAZOLE N-OXIDES

A. V. Aksenov

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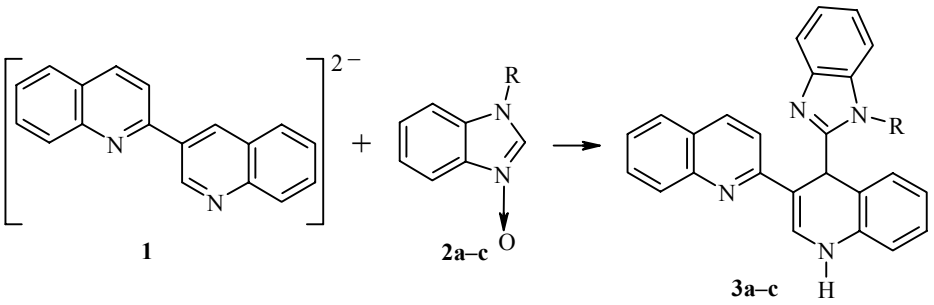
In continuing a study of the properties of the 2,3'-biquinolyl dianion (**1**), convenient methods for generation of which were suggested earlier in [1,2], we have studied its arylation by 1-alkylbenzimidazole N-oxides **2**. Arylation of dianions of aromatic compounds by such compounds has not been reported previously.

We have shown that the 2,3'-biquinolyl dianion, obtained from 2,3'-biquinolyl and metallic lithium and potassium in absolute THF (**1** to metal ratio, 1:3), when boiled with a 1.1-fold molar excess of the above listed N-oxides for 1 h, forms the arylation products at the 4' position: 4'-(1-alkyl-2-benzimidazolyl)-1',4'-dihydro-2,3'-biquinolyls **3a-c** in 23% to 31% yield (the isolation is similar to that presented in [2]).



1 **2a–c** **3a–c**

2, 3 a R = CH_3; **b** R = C_2H_5; **c** R = *i*-C_3H_7

The key reaction step is probably electron transfer from dianion **1** to N-oxides **2a-c**.

4'-(1-Methyl-2-benzimidazolyl)-1',4'-dihydro-2,3'-biquinolyl (3a). Yield 31%; mp 266-267°C (benzene). According to data in [2]; mp 266-267°C. A mixed sample with a known sample does not result in depression of the melting point. The ^{1}H NMR spectrum is identical to that given in [2].

4'-(1-Ethyl-2-benzimidazolyl)-1',4'-dihydro-2,3'-biquinolyl (3b). Yield 28%; mp 225-227°C (benzene). ^{1}H NMR spectrum (200 MHz; acetone-d_6), δ, ppm, *J*, Hz: 1.44 (3H, t, *J* = 7.26, Me); 4.6 (1H, dq, $J_{CHa-CHb}$ = 15.36, J_{Me-CHa} = 7.26, C$\underline{H}_a$H$_b$Me); 5.02 (1H, dq, $J_{CHa-CHb}$ = 15.36, J_{Me-CHb} = 7.26, CH$_a\underline{H}_b$Me); 6.36 (1H, s, 4'-H); 6.85 (1H, dd, $J_{5'6'}$ = 7.58, $J_{6'7'}$ = 7.42, 6'-H); 6.97 (1H, d, $J_{7'8'}$ = 7.98, 8'-H); 7.06 (4H, m, 5'-H, 7'-H, 5"-H, 6"-H); 7.35 (1H, dd, J_{67} = 7.31, J_{78} = 8.04, 7-H); 7.40 (1H, dd, $J_{6"7"}$ = 7.67, $J_{5"7"}$ = 1.63, 7"-H); 7.47 (1H, dd, $J_{4"5"}$ = 8.55, $J_{4"6"}$ = 2.35, 4"-H); 7.57 (1H, dd, J_{56} = 8.08, J_{67} = 7.41, 6-H); 7.69 (1H, d, J_{56} = 8.04, 5-H); 7.80 (1H,

Stavropol State University, Stavropol 355009, Russia; e-mail: nauka@stavsu.ru. Translated from Khimiya Geterotsiklicheskikh Soedinenii, No. 4, pp. 556-557, April, 2001. Original article submitted December 28, 2000.

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d, J_{34} = 8.75, 3-H); 7.87 (1H, d, J_{78} = 8.34, 8-H); 7.92 (1H, d, $J_{NH\text{-}2'H}$ = 5.55, 2'-H); 7.99 (1H, d, J_{34} = 8.75, 4-H); 8.75 (1H, d, $J_{NH\text{-}2'H}$ = 5.55, NH). Found, %: C 80.69; H 5.43; N 13.88. $C_{27}H_{22}N_4$. Calculated, %: C 80.57; H 5.51; N 13.92.

4'-(1-Isopropyl-2-benzimidazolyl)-1',4'-dihydro-2,3'-biquinolyl (3c). Yield 23%; mp 206-208°C (benzene). According to data in [2], mp 206-208°C. A mixed sample with a known sample does not result in depression of the melting point. The ^{1}H NMR spectrum is identical to that given in [2].

REFERENCES

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