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SHORT COMMUNICATIONS

Synthesis of 2-Phenylquinoxaline from α-Substituted *N*-(2-Dichloro-2-phenylethyl)arenesulfonamides and *o*-Phenylenediamine

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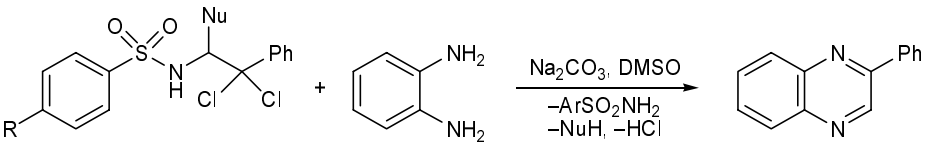
While continuing our systematic studies on the reactivity of functionally substituted *N*-(haloalkyl)-arenesulfonamides, which became accessible due to development of procedures for their synthesis from *N*-sulfonyl polyhalogenated aldehyde imines [1], we found that *N*-(2,2-dichloro-2-phenylethyl)arenesulfonamides [1–4] containing a nucleofugal group (hydroxy, alkoxy, or arylsulfonylamino) in the α-position with respect to the amide nitrogen atom react with *o*-phenylenediamine to give 2-phenylquinoxaline in a good yield (Scheme 1); i.e., these compounds behave as synthetic equivalents of 2-phenyl-2-oxoacetaldehyde. The reaction occurs on stirring the reactants in an aprotic dipolar solvent for 5–6 h in the presence of an inorganic base and is accompanied by elimination of the corresponding arenesulfonamide. The process is favored by heating at the initial moment.

The formation of 2-phenylquinoxaline was proved by spectral methods. The melting point of the isolated product coincided with that reported in [5]. As a rule, reactions of α-functionalized *N*-(2,2-dichloro-2-phenylethyl)arenesulfonamides with nucleophiles give rise to complex mixtures of products, which include arenesulfonamides and unidentified compounds presumably resulting from nucleophilic replacement of halogen atoms and functional groups and hydrolytic transformations.

We were thus the first to demonstrate the possibility for synthesizing heterocyclic systems from *N*-(2,2-dichloro-2-phenylethyl)arenesulfonamides and difunctional nucleophiles in aprotic dipolar medium in the presence of inorganic bases. We are now studying reactions of *N*-arylsulfonyl dichlorophenylacetaldehyde imine derivatives with a number of aliphatic and aromatic diamines, *N*-hydroxy amines, hydroxylamines, etc., with a view to obtain fused heterocyclic compounds of the quinoxaline, diazine, diazepine, and other systems.

2-Phenylquinoxaline. A mixture of 1.90 g (5 mmol) of 4-chloro-*N*-(2,2-dichloro-1-hydroxy-2-phenylethyl)benzenesulfonamide, 1.08 g (0.01 mol) of *o*-phenylenediamine, 2.12 g (0.02 mol) of Na_2CO_3, and 8–10 ml of DMSO was stirred for 0.5 h at 70–80°C and for 5 h at room temperature. The mixture was diluted with 50 ml of hot water, and the precipitate of 2-phenylquinoxaline was filtered off and dried. Yield 0.86 g (83%), mp 75–76°C; published data [5]: mp 78°C. The reactions with the other *N*-[1-hydroxy-(or alkoxy, or arylsulfonylamino)-2,2-dichloro-2-phenylethyl]arenesulfonamides were performed in a similar

Scheme 1.



R = 4-Cl, H; Nu = HO, AlkO, $ArSO_2NH$.

way. ^{1}H NMR spectrum (DMSO-d_6), δ, ppm: 7.55, 7.80, 8.07, and 8.31 m (9H, H_{arom}); 9.47 s (1H, N=CH). ^{13}C NMR spectrum (DMSO-d_6), δ_C, ppm: 128.24, 129.81, 129.91, 137.50 (C_6H_5); 130.27, 131.06, 142.49, 142.82 (C_6H_4); 144.23 (N=CH); 152.19 (N=**C**Ph). Found, %: C 81.11; H 4.98; N 13.68. $C_{14}H_{10}N_2$. Calculated, %: C 81.53; H 4.89; N 13.58.

The ^{1}H and ^{13}C NMR spectra were recorded on a Bruker DPX-400 spectrometer at 400.6 and 100.61 MHz, respectively, from solutions with a concentration of 5–10%; hexamethyldisiloxane was used as internal reference.

REFERENCES

1. Levkovskaya, G.G., Drozdova, T.I., Rozentsveig, I.B., and Mirskova, A.N., *Usp. Khim*., 1999, vol. 68, p. 638.
2. Rozentsveig, G.N., Rozentsveig, I.B., Levkovskaya, G.G., Evstaf'eva, I.T., and Mirskova, A.N., *Russ. J. Org. Chem*., 2001, vol. 37, p. 1297.
3. Drozdova, T.I. and Mirskova, A.N., *Russ. J. Org. Chem*., 1997, vol. 33, 1511.
4. Drozdova, T.I., Levkovskaya, G.G., and Mirskova, A.N., *Zh. Org. Khim*., 1992, vol. 29, p. 1236.
5. Fischer, O. and Römer, F., *Ber*., 1908, vol. 41, p. 2350.