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> LETTERS TO THE EDITOR

Reactions of Chlorodinitroand Dichlorodinitrobenzofuroxans with 4-[(4-Aminophenyl)sulfonyl]aniline

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Aiming to synthesize compounds possessing biological activity, we studied the reaction of 4,6-dichloro-5-nitrobenzofuroxan I and 5,7-dichloro-4,6dinitrobenzofuroxan II with 4-[(4-aminophenyl)sulfonyl]aniline III. Both benzofuroxan derivatives and diamine III (known as dapsone) have antibacterial and antifungal activity [1, 2]. We presumed that the combination of the structural fragments of these two classes of compounds in a single molecule may lead to materials with high biological activity.

Depending on the solvent nature and the reactants ratio, the reaction of furoxan I with the aromatic diamine like 4,4'-methylenedianiline or 4,4'-ethylenedi-

aniline can lead to the formation of the products of 1:1 and 1:2 composition [3]. We isolated only the product IV of 1:1 composition in the reaction of benzofuroxan I and diamine III.

The reaction of benzofuroxan II with diamine III occurs including both chlorine atoms of the benzo-furoxan ring to give compound V.

The structure of the compounds was confirmed by the ¹H NMR and IR spectra, the composition, by the elemental analysis data.

The obtained compounds IV and V were found to possess the bacteriostatic action at concentrations of



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500–15.6 mg l^{-1} . The activity of compound IV is much higher than that of compound V.

4-[4-(4-Aminophenyl)sulfonylphenyl]amino-6chloro-5-nitrobenzo[c]-1,2,5-oxadiazole 1-oxide (IV). To a solution of 0.125 g of benzofuroxan I in 5 ml of DMSO was added dropwise 0.21 g of diamine III in 5 ml of DMSO at 20°C. The reaction mixture was kept for 30 min and then poured into the distilled water. The precipitate was separated, washed with water, and dried in a vacuum at 40°C to the constant weight. Yield 0.18 g (78 %), mp 116-117°C (hexane). IR spectrum, v, cm⁻¹: 1146 (SO₂), 1359 (NO₂, s), 1561 (NO₂, as), 1612 (furoxan), 3096 (ArH), 3306 (NH). ¹H NMR spectrum (acetone- d_6), δ , ppm (J, Hz): 5.92 s $(2H, NH_2), 7.14 \text{ s} (1H, CH^7), 7.17 \text{ d} (2H, Ar, {}^{3}J_{HH} 8.5),$ 7.32 d (2H, Ar, ${}^{3}J_{HH}$ 8.5), 8.05 d (2H, Ar, ${}^{3}J_{HH}$ 8.5), 8.14 d (2H, Ar, ${}^{3}J_{HH}$ 8.5), 8.40 s (1H, NH). Found, %: C 46.56; H 2.42; Cl 7.08; N 15.31; S 7.05. C₁₈H₁₂ClN₅O₆S. Calculated, %: C 46.81; H 2.62; Cl 7.68; N 15.16; S 6.94.

5,7-Bis{[4-(4-aminophenyl)sulfonylphenyl]amino}-4,6-dinitrobenzo[*c*]-1,2,5-oxadiazol 1-oxide (V) was obtained similarly from 0.125 g of compound II and 0.42 g of diamine III. Yield 0.32 g (89%), mp 90–92°C (hexane). IR spectrum, v, cm⁻¹: 1148 (SO₂), 1360 (NO₂, s), 1559 (NO₂, as), 1636 (furoxan), 3315 (NH). ¹H NMR spectrum (DMSO- d_6), δ , ppm (*J*, Hz): 5.94 br. s (2H, NH₂), 6.07 s (2H, NH₂), 6.56–6.63 m (4H, Ar), 6.92–6.98 m (2H, Ar), 7.27–7.35 m (2H, Ar), 7.41–7.48 m (2H, Ar), 7.51–7.57 m (2H, Ar), 7.64– 7.67 m (2H, Ar), 7.74–7.77 m (2H, Ar), 11.32 s (1H, NH), 11.36 s (1H, NH). Found, %: C 50.35; H 2.99; N 15.62; S 9.02. $C_{30}H_{22}N_8O_{10}S_2$. Calculated, %: C 50.14; H 3.09; N 15.59; S 8.92.

The IR spectra were registered on a Vector 22 Bruker spectrometer in the range of 400–3600 cm⁻¹. The ¹H NMR spectra were recorded on an Avance-600 instrument operating at 600.13 MHz and reported relative to the residual protons of the deuterated solvents (acetone- d_6 , DMSO- d_6).

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