

SHORT  
COMMUNICATIONS

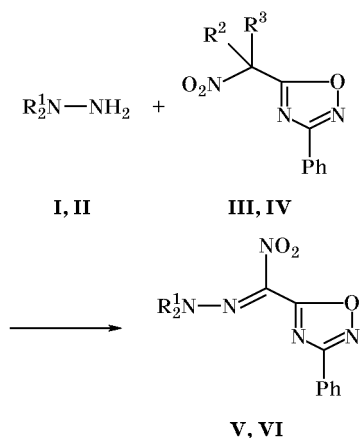
## Reaction of Unsymmetrically Substituted Hydrazines with 5-Nitromethyl-3-phenyl-1,2,4-oxadiazoles

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$\alpha$ -C-Nitro hydrazones attract interest as compounds exhibiting a wide spectrum of fungicide and antimicrobial activity [1, 2]. It was also found that the antimicrobial effect against *Staphylococcus aureus* appreciably increases when the double bond (or a nitro or carbonyl group) is conjugated with a heteroring [3]. With the goal of obtaining new azole derivatives possessing antimicrobial activity and studying concurrent substituent effects in the nitromethyl fragment of 5-nitromethyl-3-phenyl-1,2,4-oxadiazoles we examined the reactions of *N,N*-diphenyl- and *N,N*-dimethylhydrazines **I** and **II** with 3-phenyl-5-trinitromethyl-1,2,4-oxadiazole (**III**) and ethyl chloro(nitro)-3-phenyl-1,2,4-oxadiazol-5-ylacetate (**IV**). These reactions occurred under mild conditions and afforded hitherto unknown substituted 1,2,4-oxadiazol-5-yl-(nitro)methylene hydrazines **V** and **VI**:



**I, V**, R<sup>1</sup> = Ph; **II, VI**, R<sup>1</sup> = Me; **III**, R<sup>2</sup> = R<sup>3</sup> = NO<sub>2</sub>;  
**IV**, R<sup>2</sup> = Cl, R<sup>3</sup> = COOEt.

Presumably, the process follows the same pattern as in the reaction of unsymmetrically substituted hydrazines with tetranitro- or halotrinitromethanes [4].

The structure of compounds **V** and **VI** was determined on the basis of the IR, <sup>1</sup>H NMR, and UV spectra.

Hydrazines **I** and **II** were prepared by treatment of the corresponding hydrochlorides with a solution of alkali, followed by extraction with diethyl ether.

A solution of 5 mmol of compound **III** [5] or **IV** [6] in 10 ml of dry diethyl ether was added at 0°C to a solution of 5 mmol of substituted hydrazine **I** or **II** in 50 ml of dry ether. The mixture was kept for 2 h at 25°C and evaporated, and the residue was subjected to chromatography in a 250 × 10-mm column charged with activated silica gel (Silicagel 100/400 μm) using benzene as eluent.

**N,N**-Diphenyl-*N'*-[nitro(3-phenyl-1,2,4-oxadiazol-5-yl)methylene]hydrazine (**V**). Yield 41%, mp 175–176°C (from ethanol). IR spectrum,  $\nu$ , cm<sup>-1</sup>: 1545, 1290 (NO<sub>2</sub>); 1645 (C=N). <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 7.20–7.61 m. UV spectrum,  $\lambda_{\max}$  (log  $\epsilon$ ), nm: 240 (4.11), 375 (3.98). Found, %: C 65.39; H 3.84; N 18.10. C<sub>21</sub>H<sub>15</sub>N<sub>5</sub>O<sub>3</sub>. Calculated, %: C 65.46; H 3.90; N 18.18.

**N,N**-Dimethyl-*N'*-[nitro(3-phenyl-1,2,4-oxadiazol-5-yl)methylene]hydrazine (**VI**). Yield 45%, mp 63–64°C (from ethanol). IR spectrum,  $\nu$ , cm<sup>-1</sup>: 1545, 1290 (NO<sub>2</sub>); 1645 (C=N). <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 7.55 m (5H, H<sub>arom</sub>), 2.83 s (6H, CH<sub>3</sub>). UV spectrum,  $\lambda_{\max}$ , nm (log  $\epsilon$ ): 240 nm (4.11), 377 (3.99). Found, %: C 50.51; H 4.17; N 26.75. C<sub>11</sub>H<sub>11</sub>N<sub>5</sub>O<sub>3</sub>. Calculated, %: C 50.58; H 4.22; N 26.82.

The IR spectra were recorded on an IKS-29 spectrometer in chloroform. The <sup>1</sup>H NMR spectra were obtained on a Tesla BS-487C instrument operating at 80 MHz; acetone-*d*<sub>6</sub> was used as solvent, and hexamethyldisiloxane, as internal reference. The electron absorption spectra were measured on an SF-8 spectrophotometer in ethanol.

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