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Synthesis of 1,2,4- and 1,3,4-Oxadiazoles from 1-Aryl-5-methyl-1*H*-1,2,3-triazole-4-carbonyl Chlorides

N. D. Obushak, N. T. Pokhodylo, N. I. Pidlypnyi, and V. S. Matiichuk

Ivan Franko Lviv National University, ul. Kirilla i Mefodiya 6, Lviv, 79005 Ukraine
e-mail: obushak@in.lviv.ua

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Abstract—5-Substituted 2-(1-aryl-5-methyl-1*H*-1,2,3-triazol-4-yl)-1,3,4-oxadiazoles were synthesized by reaction of 1-aryl-5-methyl-1*H*-1,2,3-triazole-4-carbonyl chlorides with the corresponding 5-substituted 1*H*-tetrazoles. 5-Methyl-1-phenyl-1*H*-1,2,3-triazole-4-carbonyl chloride reacted with *N*′-hydroxybenzimidamides to give 3-aryl-5-(5-methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-1,2,4-oxadiazoles. Reactions of 4-(5-methyl-1*H*-1,2,3-triazol-1-yl)benzoic acid with *N*′-hydroxybenzimidamides resulted in the formation of 3-aryl-5-[4-(5-methyl-1*H*-1,2,3-triazol-1-yl)phenyl]-1,2,4-oxadiazoles.

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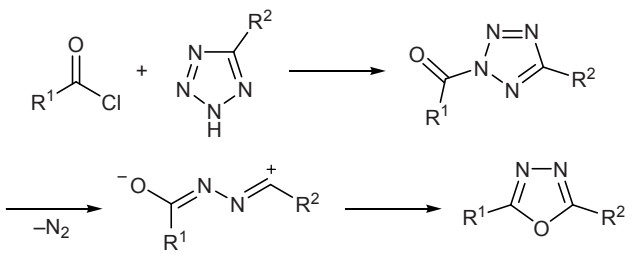
1,3,4-Oxadiazoles constitute an important class of heterocyclic compounds [1]. Numerous 1,3,4-oxadiazole derivatives exhibit biological activity, in particular antiphlogistic and hypotensive [2], bactericidal [3], hypoglycemic [4], myorelaxant [5], fungicidal [6], insecticidal [7], and pesticidal [8]. Central nervous system stimulators were found among 1,3,4-oxadiazole derivatives [9], and such medical agents as Vadrin, Eudormil, and SC27166 are based on compounds of this class [10–12]. 1,2,4-Oxadiazoles have also found application, e.g., as hydrolytically stable bioisosters of amide and ester groups [13], antidepressants [14], 5-HT_{1D} receptor agonists [15], and antiviral agents [16]. Compounds containing a 1,2,3-triazole ring also possess biological activity [17].

In the present work we tried to find synthetic approaches to compounds including both 1,2,3-triazole and oxadiazole fragments. It is known that 2,5-disubstituted 1,3,4-oxadiazoles can be obtained by reaction of carboxylic acid chlorides with tetrazoles [18], which is accompanied by thermal rearrangement with liberation of nitrogen (Scheme 1). However, it is more likely that elimination of nitrogen molecule and formation of oxadiazole ring follow a synchronous mechanism [19]. Analogous reactions of triazolecarboxylic acid chlorides were not reported. Such reactions might be expected to involve competing processes due to opening of the triazole ring with formation of highly reactive intermediates.

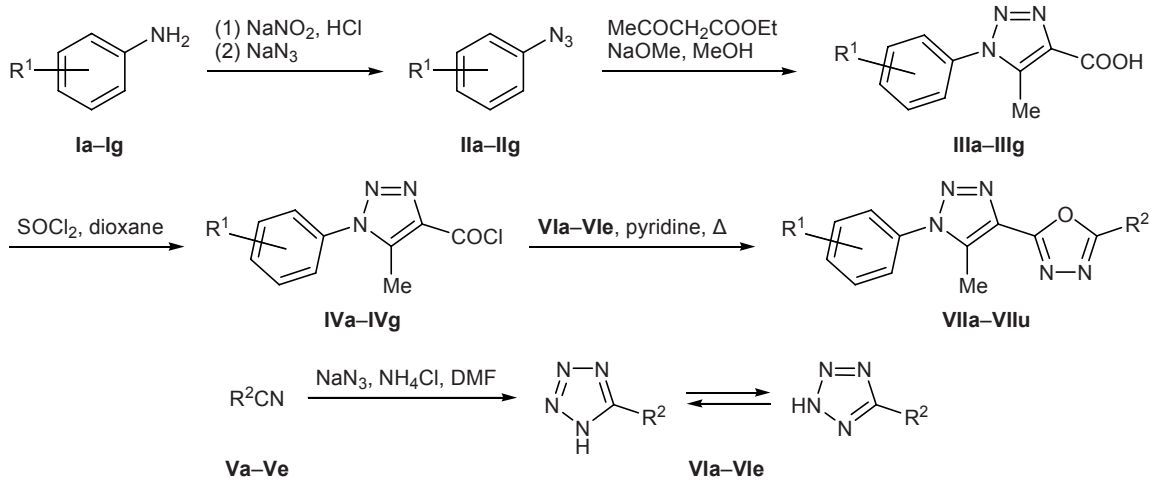
Scheme 1.



We have found that 5-substituted tetrazoles **VIa**–**VIe** react with 1-aryl-5-methyl-1*H*-1,2,3-triazole-4-carbonyl chlorides **IVa**–**IVg** to give in all cases the corresponding 1,3,4-oxadiazoles **VIIa**–**VIIu** having a triazolyl substituent in the 5-position. The reactions start at a temperature of about 60°C and are complete in 30 min, and the yields of compounds **VIIa**–**VIIu** range from 54 to 83% (Scheme 2). Initial tetrazoles **VIa**–**VIe** were obtained by 1,3-dipolar cycloaddition of sodium azide to nitriles **Va**–**Ve** [20], and triazolecarboxylic acids **IIIa**–**IIIg** were prepared by cycloaddition of aryl azides **IIa**–**IIg** to ethyl acetoacetate. Compounds **IIa**–**IIg** were synthesized in turn from substituted anilines **Ia**–**Ig** via diazotization followed by treatment with sodium azide.

We also examined reactions of acid chloride **IVa** with *N*′-hydroxybenzimidamides **IXa**–**IXc**. The reactions were carried out in pyridine at room temperature, and the mixture was then heated in DMF for 3 h at 80°C. These conditions allowed us to avoid decom-

Scheme 2.



I–**IV**, R^1 = H (**a**), 2-Me (**b**), 3-Me (**c**), 4-Me (**d**), 4-F (**e**), 2-MeO (**f**), 3-MeO (**g**); **V**, **VI**, R^2 = Ph (**a**), 2-MeC_6H_4 (**b**), 4-MeC_6H_4 (**c**), 2-ClC_6H_4 (**d**), 2-furyl (**e**); **VII**, R^1 = H, R^2 = Ph (**a**), 2-MeC_6H_4 (**b**), 4-MeC_6H_4 (**c**), 2-ClC_6H_4 (**d**), 2-furyl (**e**); R^1 = 2-Me, R^2 = Ph (**f**), 4-MeC_6H_4 (**g**), 2-furyl (**h**); R^1 = 3-Me, R^2 = Ph (**i**), 2-MeC_6H_4 (**j**); R^1 = 4-Me, R^2 = Ph (**k**), 2-MeC_6H_4 (**l**), 4-MeC_6H_4 (**m**), 2-furyl (**n**); R^1 = 4-F, R^2 = Ph (**o**), 2-MeC_6H_4 (**p**), 2-furyl (**q**); R^1 = 2-MeO, R^2 = Ph (**r**), 4-MeC_6H_4 (**s**); R^1 = 3-MeO, R^2 = Ph (**t**), 2-MeC_6H_4 (**u**).

position of the triazole ring and tarring; as a result, almost no by-products were formed, and compounds **Xa** and **Xb** were isolated in high yields (Scheme 3). Thus the proposed procedure may be regarded as a preparative method of synthesis of compounds simultaneously containing both 1,2,3-triazole and 1,2,4-oxadiazole fragments. *N*′-Hydroxybenzimidamides **IXa**–**IXc** were synthesized by addition of hydroxylamine to nitriles **VIIIa**–**VIIIc**.

Compounds containing 1,2,4-oxadiazole and triazole rings were also obtained starting from triazolyl-substituted benzoic acid **XII** which was synthesized from 4-azidobenzoic acid (**IIh**) and phosphorane **XI**. The corresponding acid chloride **XIII** smoothly reacted with amide oximes **IXb** and **IXc**, yielding compounds **XIVa** and **XIVb**, respectively (Scheme 4).

Thus the results of our study demonstrate the possibility for synthesizing molecular ensembles including oxadiazole and triazole rings in different combinations by reactions of triazolecarboxylic acid chlorides with tetrazoles or *N*′-hydroxybenzimidamides.

EXPERIMENTAL

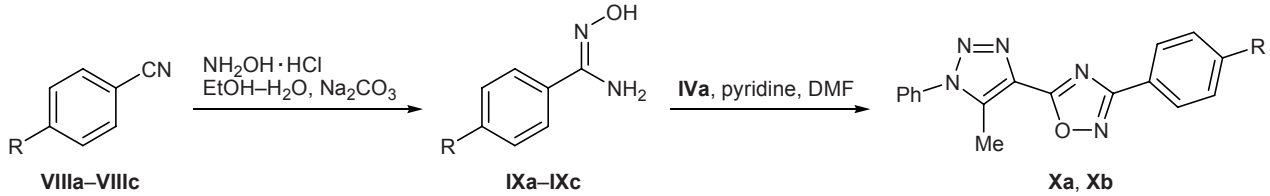
The ^{1}H NMR spectra were measured on a Varian Mercury spectrometer (400 MHz) using DMSO-d_6 as solvent and tetramethylsilane as internal reference.

Aryl azides IIa–IIh were synthesized according to the procedure reported in [21]: **IIa**, yield 63%, bp 52–53°C (10 mm); **IIb**, yield 46%, bp 62°C (10 mm); **IIc**, yield 67%, bp 78°C (10 mm); **IId**, yield 70%, bp 70°C (10 mm); **IIe**, yield 78%; **IIf**, yield 57%, bp 87–89°C (1 mm); **IIg**, yield 78%; **IIh**, yield 87%, mp 179–180°C (from aqueous ethanol); azides **IIe** and **IIg** were used without additional purification.

Acids IIIa–IIIg were prepared as described in [22] and were purified by recrystallization from aqueous alcohol: **IIIa**, yield 84%, mp 137–138°C; **IIIb**, yield 65%, mp 134–135°C; **IIIc**, yield 54%, mp 158–159°C; **IIId**, yield 76%, mp 183–184°C; **IIIe**, yield 88%, mp 187–188°C; **IIIf**, yield 63%, mp 175–176°C; **IIIg**, yield 68%, mp 133–134°C.

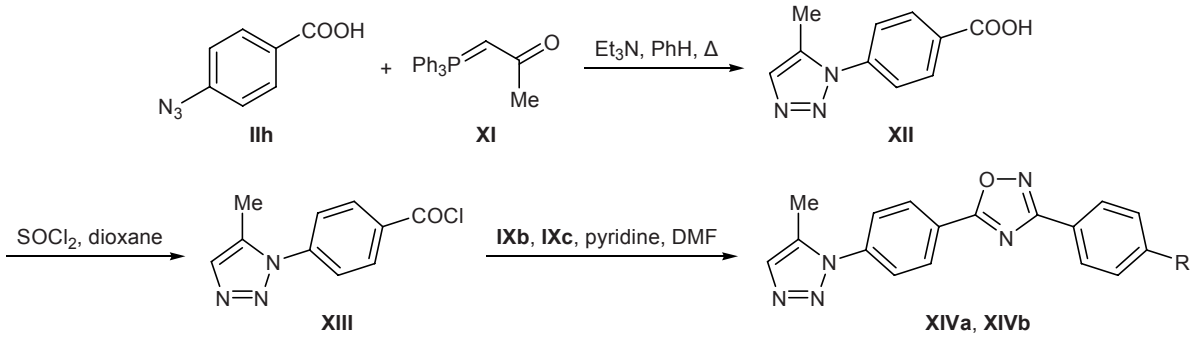
Acid chlorides IVa–IVg and XIII (*general procedure***).** A mixture of 50 mmol of the corresponding

Scheme 3.



VIII, **IX**, R = H (**a**), Me (**b**), Cl (**c**); **X**, R = H (**a**), Me (**b**).

Scheme 4.



XIV, R = Me (**a**), Cl (**b**).

carboxylic acid and 4.4 ml (60 mmol) of thionyl chloride in 30 ml of dioxane was heated under reflux until hydrogen chloride no longer evolved. The mixture was cooled to room temperature, 30 ml of hexane was added, and the precipitate was filtered off, washed with hexane on a filter, and dried in air: **IVa**, yield 95%, mp 126–127°C; **IVb**, yield 89%, mp 143–144°C; **IVc**, yield 91%, mp 75–76°C; **IVd**, yield 97%, mp 142–143°C; **IVe**, yield 96%, mp 85–86°C; **IVf**, yield 84%, mp 122–123°C; **IVg**, yield 88%, mp 125–126°C; **XIII**, yield 63%, mp 175–176°C.

Tetrazoles VIa–VIe were synthesized according to the procedure described in [20]: **VIa**, yield 82%, mp 218–219°C; **VIb**, yield 61%, mp 150–151°C; **VIc**, yield 87%, mp 257–258°C; **VId**, yield 74%, mp 176–177°C; **VIe**, yield 75%, mp 201–202°C.

***N′*-Hydroxybenzimidamides IXa–IXc** were prepared as described in [23]: **IXa**, yield 70%, mp 71°C; **IXb**, yield 83%, mp 155°C; **IXc**, yield 72%, mp 129°C.

4-Azidobenzoic acid (XII) was obtained as described in [24]. Yield 82%, mp 243–244°C.

1,3,4-Oxadiazoles VIIa–VIIu (*general procedure***).** Acid chloride **IVa**–**IVg**, 5 mmol, was added to a solution of 5 mmol of tetrazole **VIa**–**VIe** in 5 ml of pyridine. The mixture was heated until nitrogen no longer evolved, heated for 30 min under reflux, cooled, and diluted with 50 ml of water. The precipitate was filtered off, washed on a filter with water (up to 50 ml), dried in air, and purified by recrystallization.

2-(5-Methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-5-phenyl-1,3,4-oxadiazole (VIIa). Yield 79%, mp 137°C. ^{1}H NMR spectrum, δ, ppm: 2.73 s (3H, Me), 7.60–7.70 m (8H, H_{arom}), 8.14 m (2H, H_{arom}). Found, %: C 67.14; H 4.41; N 22.98. $C_{17}H_{13}N_5O$. Calculated, %: C 67.32; H 4.32; N 23.09.

2-(2-Methylphenyl)-5-(5-methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-1,3,4-oxadiazole (VIIb). Yield 63%, mp 149°C. ^{1}H NMR spectrum, δ, ppm: 2.72 s (3H, Me), 2.75 s (3H, Me), 7.38–7.52 m (3H, H_{arom}), 7.62–7.68 m (5H, H_{arom}), 8.04 d (1H, 6-H, J = 7.6 Hz). Found, %: C 68.22; H 4.82; N 21.95. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

2-(4-Methylphenyl)-5-(5-methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-1,3,4-oxadiazole (VIIc). Yield 78%, mp 155°C. ^{1}H NMR spectrum, δ, ppm: 2.47 s (3H, Me), 2.72 s (3H, Me), 7.41 d (2H, 3-H, 5-H in 4-MeC_6H_4, J = 8.0 Hz), 7.62–7.69 m (5H, C_6H_5), 8.02 d (2H, 2-H, 6-H in 4-MeC_6H_4, J = 8.0 Hz). Found, %: C 67.84; H 4.66; N 22.15. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

2-(2-Chlorophenyl)-5-(5-methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-1,3,4-oxadiazole (VIId). Yield 59%, mp 145°C. ^{1}H NMR spectrum, δ, ppm: 2.73 s (3H, Me), 7.57 pseudotriplet (1H, 4-H in C_6H_4), 7.61–7.69 m (7H, H_{arom}), 8.10 d (1H, 6-H in C_6H_4, J = 8.0 Hz). Found, %: C 60.49; H 3.50; N 20.87. $C_{17}H_{12}ClN_5O$. Calculated, %: C 60.45; H 3.58; N 20.73.

2-(2-Furyl)-5-(5-methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-1,3,4-oxadiazole (VIIe). Yield 70%, mp 137°C. ^{1}H NMR spectrum, δ, ppm: 2.72 s (3H, Me), 6.76 d.d (1H, 4′-H, J = 1.6, 3.2 Hz), 7.38 d (1H, 3′-H, J = 3.2 Hz), 7.62–7.69 m (5H, H_{arom}), 7.99 d (1H, 5′-H, J = 1.6 Hz). Found, %: C 61.09; H 3.65; N 23.91. $C_{15}H_{11}N_5O_2$. Calculated, %: C 61.43; H 3.78; N 23.88.

2-[5-Methyl-1-(2-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-phenyl-1,3,4-oxadiazole (VIIf). Yield 72%, mp 144°C. ^{1}H NMR spectrum, δ, ppm: 2.09 s (3H, Me), 2.53 s (3H, Me), 7.42–7.64 m (7H, H_{arom}), 8.13–8.16 m (2H, H_{arom}). Found, %: C 68.01; H 4.82; N 21.94. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

2-[5-Methyl-1-(2-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-(4-methylphenyl)-1,3,4-oxadiazole

(VIIg). Yield 74%, mp 127°C. ^{1}H NMR spectrum, δ, ppm: 2.09 s (3H, Me), 2.46 s (3H, Me), 2.52 s (3H, Me), 7.41 d (2H, 3-H, 5-H in 4-MeC_6H_4, J = 8.0 Hz), 7.46 d (1H, 3-H in 2-MeC_6H_4, J = 8.0 Hz), 7.48–7.59 m (3H, 2-MeC_6**H**$_4$), 8.02 d (2H, 2-H, 6-H in 4-MeC_6H_4, J = 8.0 Hz). Found, %: C 68.98; H 5.14; N 21.01. $C_{19}H_{17}N_5O$. Calculated, %: C 68.87; H 5.17; N 21.13.

2-(2-Furyl)-5-[5-methyl-1-(2-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-1,3,4-oxadiazole (VIIh). Yield 54%, mp 117°C. ^{1}H NMR spectrum, δ, ppm: 2.08 s (3H, Me), 2.50 s (3H, Me), 6.77 d.d (1H, 4′-H, J = 1.2, 3.6 Hz), 7.38 d (1H, 3′-H, J = 3.6 Hz), 7.42–7.58 m (4H, C_6H_4), 7.99 d (1H, 5′-H, J = 1.2 Hz). Found, %: C 62.45; H 4.19; N 22.85. $C_{16}H_{13}N_5O_2$. Calculated, %: C 62.53; H 4.26; N 22.79.

2-[5-Methyl-1-(3-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-phenyl-1,3,4-oxadiazole (VIIi). Yield 76%, mp 119°C. ^{1}H NMR spectrum, δ, ppm: 2.49 s (3H, Me), 2.72 s (3H, Me), 7.41–7.48 m (3H, C_6H_4), 7.52 pseudotriplet (1H, 5-H in C_6H_4), 7.58–7.63 m (3H, C_6H_5), 8.12–8.16 m (2H, C_6H_5). Found, %: C 68.22; H 4.85; N 22.13. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

2-[5-Methyl-1-(3-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-(2-methylphenyl)-1,3,4-oxadiazole (VIIj). Yield 65%, mp 129°C. ^{1}H NMR spectrum, δ, ppm: 2.49 s (3H, Me), 2.71s (3H, Me), 2.75 s (3H, Me), 7.39–7.56 m (7H, H_{arom}), 8.05 d (1H, 6-H in 2-MeC_6H_4, J = 7.6 Hz). Found, %: C 68.53; H 5.07; N 20.89. $C_{19}H_{17}N_5O$. Calculated, %: C 68.87; H 5.17; N 21.13.

2-[5-Methyl-1-(4-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-phenyl-1,3,4-oxadiazole (VIIk). Yield 80%, mp 182°C. ^{1}H NMR spectrum, δ, ppm: 2.48 s (3H, Me), 2.70 s (3H, Me), 7.45 d (2H, 3-H, 5-H in C_6H_4, J = 8.4 Hz), 7.53 d (2H, 2-H, 6-H in C_6H_4, J = 8.4 Hz), 7.60–7.63 m (3H, C_6H_5), 8.12–8.16 m (2H, 2-H, 6-H in C_6H_5). Found, %: C 67.80; H 4.71; N 21.97. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

2-[5-Methyl-1-(4-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-(2-methylphenyl)-1,3,4-oxadiazole (VIIl). Yield 74%, mp 148°C. ^{1}H NMR spectrum, δ, ppm: 2.48 s (3H, Me), 2.70 s (3H, Me), 2.75 s (3H, Me), 7.39–7.56 m (7H, H_{arom}), 8.05 d (1H, 6-H in 2-MeC_6H_4, J = 7.6Hz). Found, %: C 68.98; H 5.12; N 21.22. $C_{19}H_{17}N_5O$. Calculated, %: C 68.87; H 5.17; N 21.13.

2-[5-Methyl-1-(4-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-5-(4-methylphenyl)-1,3,4-oxadiazole (VIIm). Yield 82%, mp 186°C. ^{1}H NMR spectrum, δ, ppm: 2.46 s (3H, Me), 2.48 s (3H, Me), 2.69 s (3H, Me), 7.41 (2H, 3-H, 5-H in C_6H_4N, J = 8.2 Hz), 7.45 (2H, 3-H, 5-H in C_6H_4, J = 8.0 Hz), 7.53 (2H, 2-H, 6-H in C_6H_4N, J = 8.2 Hz), 8.01 (2H, 2-H, 6-H in C_6H_4, J = 8.0 Hz). Found, %: C 68.48; H 5.06; N 21.09. $C_{19}H_{17}N_5O$. Calculated, %: C 68.87; H 5.17; N 21.13.

2-(2-Furyl)-5-[5-methyl-1-(4-methylphenyl)-1*H*-1,2,3-triazol-4-yl]-1,3,4-oxadiazole (VIIn). Yield 79%, mp 174°C. ^{1}H NMR spectrum, δ, ppm: 2.48 s (3H, Me), 2.69 s (3H, Me), 6.76 d.d (1H, 4′-H, J = 1.6, 3.2 Hz), 7.38 d (1H, 3′-H, J = 3.2Hz), 7.44 d (2H, 3-H, 5-H in C_6H_4, J = 8.0 Hz), 7.53 d (2H, 2-H, 6-H in C_6H_4, J = 8.0 Hz), 7.99 br.s (1H, 5′-H). Found, %: C 62.41; H 4.21; N 22.70. $C_{16}H_{13}N_5O_2$. Calculated, %: C 62.53; H 4.26; N 22.79.

2-[1-(4-Fluorophenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-phenyl-1,3,4-oxadiazole (VIIo). Yield 79%, mp 169°C. ^{1}H NMR spectrum, δ, ppm: 2.70 s (3H, Me), 7.43 pseudotriplet (2H, 3-H, 5-H in 4-FC_6H_4), 7.58–7.62 m (3H, C_6H_5), 7.74 d.d (2H, 2-H, 6-H in 4-FC_6H_4, J_{HF} = 4.8, J_{HH} = 8.8 Hz), 8.11–8.14 m (2H, C_6H_5). Found, %: C 63.61; H 3.63; N 21.78. $C_{17}H_{12}FN_5O$. Calculated, %: C 63.55; H 3.76; N 21.80.

2-[1-(4-Fluorophenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-(2-methylphenyl)-1,3,4-oxadiazole (VIIp). Yield 83%, mp 127°C. ^{1}H NMR spectrum, δ, ppm: 2.70 s (3H, Me), 2.74 s (3H, Me), 7.38–7.52 m (5H, H_{arom}), 7.75 d.d (2H, 2-H, 6-H in 4-FC_6H_4, J_{HF} = 4.8, J_{HH} = 8.8 Hz), 8.04 d (1H, 6-H in 2-MeC_6H_4, J = 7.6 Hz). Found, %: C 64.28; H 4.24; N 20.97. $C_{18}H_{14}FN_5O$. Calculated, %: C 64.47; H 4.21; N 20.88.

2-[1-(4-Fluorophenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-(2-furyl)-1,3,4-oxadiazole (VIIq). Yield 75%, mp 184°C. ^{1}H NMR spectrum, δ, ppm: 2.70 s (3H, Me), 6.77 d.d (1H, 4′-H, J = 1.2, 3.6 Hz), 7.39 d (1H, 3′-H, J = 3.6 Hz), 7.44 pseudotriplet (2H, 3-H, 5-H in 4-FC_6H_4), 7.74 d.d (2H, 2-H, 6-H in 4-FC_6H_4, J_{HF} = 4.8, J_{HH} = 8.8 Hz), 7.99 d (1H, 5′-H, J = 1.2 Hz). Found, %: C 57.61; H 3.28; N 22.41. $C_{15}H_{10}FN_5O_2$. Calculated, %: C 57.88; H 3.24; N 22.50.

2-[1-(2-Methoxyphenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-phenyl-1,3,4-oxadiazole (VIIr). Yield 61%, mp 164°C. ^{1}H NMR spectrum, δ, ppm: 2.49 s (3H, Me), 3.89 s (3H, MeO), 7.19 pseudotriplet (1H, 5-H in C_6H_4), 7.32 d (1H, 3-H in C_6H_4, J = 8.4 Hz), 7.48 d (1H, 6-H in C_6H_4, J = 8.0 Hz), 7.58–7.66 m

(4H, H_{arom}), 8.12–8.15 m (2H, 2-H, 6-H in C_6H_5). Found, %: C 64.69; H 4.46; N 20.93. $C_{18}H_{15}N_5O_2$. Calculated, %: C 64.86; H 4.54; N 21.01.

2-[1-(2-Methoxyphenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-(4-methylphenyl)-1,3,4-oxadiazole (VIIs). Yield 72%, mp 135°C. ^{1}H NMR spectrum, δ, ppm: 2.46 s (3H, Me), 2.52 s (3H, Me), 3.87 s (3H, MeO), 7.19 pseudotriplet (1H, 5-H in 2-$MeOC_6H_4$), 7.33 d (1H, 3-H in 2-$MeOC_6H_4$, J = 8.4 Hz), 7.41 d (2H, 3-H, 5-H in 4-MeC_6H_4, J = 7.8 Hz), 7.48 d (1H, 6-H in 2-$MeOC_6H_4$, J = 7.6 Hz), 7.64 pseudotriplet (1H, 4-H in 2-$MeOC_6H_4$), 8.02 d (2H, 2-H, 6-H in 4-MeC_6H_4, J = 7.8 Hz). Found, %: C 65.72; H 4.80; N 20.04. $C_{19}H_{17}N_5O_2$. Calculated, %: C 65.69; H 4.93; N 20.16.

2-[1-(3-Methoxyphenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-phenyl-1,3,4-oxadiazole (VIIt). Yield 78%, mp 129°C. ^{1}H NMR spectrum, δ, ppm: 2.73 s (3H, Me), 3.89 s (3H, MeO), 7.14–7.24 m (3H, H_{arom}), 7.55 pseudotriplet (1H, H_{arom}), 7.60–7.63 m (3H, H_{arom}), 8.13–8.16 m (2H, 2-H, 6-H in C_6H_5). Found, %: C 64.94; H 4.62; N 20.86. $C_{18}H_{15}N_5O_2$. Calculated, %: C 64.86; H 4.54; N 21.01.

2-[1-(3-Methoxyphenyl)-5-methyl-1*H*-1,2,3-triazol-4-yl]-5-(2-methylphenyl)-1,3,4-oxadiazole (VIIu). Yield 62%, mp 152°C. ^{1}H NMR spectrum, δ, ppm: 2.72 s (3H, Me), 2.74 s (3H, Me), 3.88 s (3H, MeO), 7.15–7.23 m (3H, H_{arom}), 7.39–7.57 m (4H, H_{arom}), 8.07 d (1H, 6-H in 2-MeC_6H_4, ^3J = 8.0 Hz). Found, %: C 65.54; H 4.77; N 20.07. $C_{19}H_{17}N_5O_2$. Calculated, %: C 65.69; H 4.93; N 20.16.

1,2,4-Oxadiazoles Xa, Xb, XIVa, and XIVb (*general procedure*). Compound **IVa** or **XIII**, 5 mmol, was added to a solution of 5 mmol of amide oxime **IXa**–**IXc** in 2 ml of pyridine. The mixture was kept for 0.5 h, 5 ml of DMF was added, and the mixture was heated for 3 h at 80°C, cooled to room temperature, and mixed with 30 ml of water. The precipitate was filtered off, washed with water on a filter, recrystallized from alcohol, and dried in air.

5-(5-Methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl)-3-phenyl-1,2,4-oxadiazole (Xa). Yield 77%, mp 137°C. ^{1}H NMR spectrum, δ, ppm: 2.78 s (3H, Me), 7.55–7.59 m (3H, H_{arom}), 7.65–7.69 m (5H, H_{arom}), 8.12–8.15 m (2H, H_{arom}). Found, %: C 67.45; H 4.43; N 22.89. $C_{17}H_{13}N_5O$. Calculated, %: C 67.32; H 4.32; N 23.09.

3-(4-Methylphenyl)-5-[5-methyl-1-phenyl-1*H*-1,2,3-triazol-4-yl]-1,2,4-oxadiazole (Xb). Yield 82%, mp 142°C. ^{1}H NMR spectrum, δ, ppm: 2.48 s (3H, Me), 2.77 s (3H, Me), 7.35 d (2H, H_{arom}, J = 8.0 Hz), 7.64–7.69 m (5H, H_{arom}), 8.01 d (2H, 2-H, 6-H in C_6H_4, J = 8.0 Hz). Found, %: C 68.03; H 4.67; N 21.95. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

5-[4-(5-Methyl-1*H*-1,2,3-triazol-1-yl)phenyl]-3-(4-methylphenyl)-1,2,4-oxadiazole (XIVa). Yield 75%, mp 176°C. ^{1}H NMR spectrum, δ, ppm: 2.44 s (3H, Me), 2.46 s (3H, Me), 7.35 d (2H, 3-H, 5-H in 4-MeC_6H_4, J = 7.8 Hz), 7.63 s (1H, 4′-H), 7.89 d (2H, 3-H, 5-H in C_6H_4, J = 8.4 Hz), 7.99 d (2H, 2-H, 6-H in 4-MeC_6H_4, J = 7.8 Hz), 8.39 d (2H, 2-H, 6-H in C_6H_4, J = 8.4 Hz). Found, %: C 68.01; H 4.62; N 21.95. $C_{18}H_{15}N_5O$. Calculated, %: C 68.13; H 4.76; N 22.07.

3-(4-Chlorophenyl)-5-[4-(5-methyl-1*H*-1,2,3-triazol-1-yl)phenyl]-1,2,4-oxadiazole (XIVb). Yield 84%, mp 222°C. ^{1}H NMR spectrum, δ, ppm: 2.43 s (3H, Me), 7.69 d (2H, 3-H, 5-H in 4-ClC_6H_4, J = 8.4 Hz), 7.76 s (1H, 4′-H), 7.94 d (2H, 3-H, 5-H in C_6H_4, J = 8.4 Hz), 8.12 d (2H, 2-H, 6-H in 4-ClC_6H_4, J = 8.4 Hz), 8.40 d (2H, 2-H, 6-H in C_6H_4, J = 8.4 Hz). Found, %: C 60.32; H 3.50; N 20.54. $C_{17}H_{12}ClN_5O$. Calculated, %: C 60.45; H 3.58; N 20.73.

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