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Short Note

N,*N*-Dibenzyl-1-(1-[(4-methyl-2-phenyl-4,5-dihydrooxazol-4-yl)methyl)]-1*H*-1,2,3-triazol-4-yl)methanamine

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Abstract: The title compound, *N,N-dibenzyl-1-(1-[(4-methyl-2-phenyl-4,5-dihydrooxazol-4-yl)methyl)]-1H-1,2,3-triazol-4-yl)methanamine* was synthesized in high yield by 1,3-dipolar cycloaddition reaction of 4-(azidomethyl)-4-methyl-2-phenyl-4,5-dihydrooxazole and *N*,*N*-dibenzylprop-2-yn-1-amine in toluene at reflux. The structure of this product was established on the basis of NMR spectroscopy (^{1}H, ^{13}C), Elemental Analysis and MS data.

Keywords: oxazoline; 1,2,3-triazole; 1,3-dipolar cycloaddition

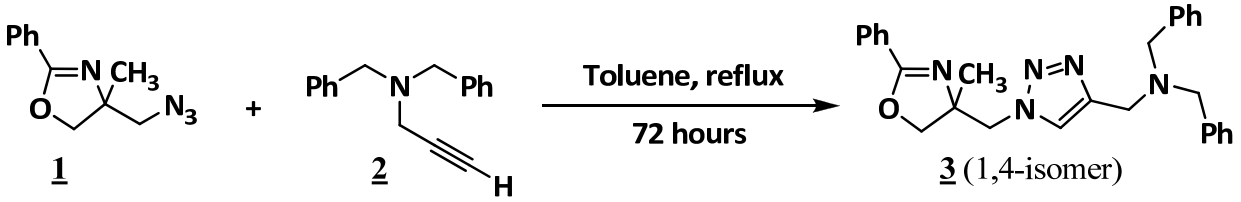
Triazoles constitute an important class of biologically active heterocyclic compounds that have received a great deal of attention since their discovery. Diverse compounds containing the 1,2,3-triazole moiety have a wide spectrum activities including antimicrobial activities [1,2], anti-HIV agents, antimicrobial, anticancer, antibacterial, antifungal, anti-tubercular compounds [3,4] and corrosion inhibitors [5].

Continuing our investigations in the use of oxazoline derivatives [6–8] in heterocyclic synthesis, we present in this short note a convenient and easy procedure for the preparation of *N,N-dibenzyl-1-(1-[(4-methyl-2-phenyl-4,5-dihydrooxazol-4-yl)methyl)]-1H-1,2,3-triazol-4-yl)methanamine* **3**, a new oxazolinic precursors of heterocyclic amino acids.

For the first time, we prepared the terminal alkyne *N,N*-dibenzylprop-2-yn-1-amine **2** by the reaction of N-alkyaltion of propargyl bromide by dibenzylamine in anhydrous acetone at room temperature in the presence of K_2CO_3 as base [9]. The intermediate **2** is obtained with a 92% yield as colorless oil, and then it was submitted to cycloaddition reaction with azide **1**.

This reaction leads normally to the formation of two regioisomers (1,4-isomer and 1,5-isomer) with prevalence of the 1,4-isomer [10]. We isolated after column chromatography on silica gel two isomers with a total yield of about 84%. The cycloadduct **3** was synthesized as shown in Scheme 1.

Scheme 1. Synthesis of compounds **3**.



A mixture of 0.65 mmol of 4-(azidomethyl)-4-methyl-2-phenyl-4,5-dihydrooxazole **1** and 0.65 mmol of *N*,*N*-dibenzylprop-2-yn-1-amine **2** in 5mL of toluene, was heated at reflux with constant stirring for 72 h. After reaction, the solvent was evaporated under vacuum and the residue was extracted with ether. The organic layer was washed with water, dried with sodium sulfate (Na_2SO_4), and the solvent was removed. The products were purified by column chromatography on silica gel using ether/hexane (1/2) as eluent to afford pure products. The major product **3**, the 1,4-isomer, was obtained as a white solid. The structures of the products were established on the basis of NMR spectroscopy (^1H, ^{13}C), Elemental analysis and MS data [11].

Description of the majority compound **3**: White solid; Proportion of isomer = 80%; R_f (ether) = 0.51; Melting point: 100–102 °C.

^1H-NMR (Bruker, 300.13 MHz, $CDCl_3$): δ (ppm) 1.42 (3H, CH_3, s); 3.37–3.47 (4H, dibenzyl, AB system, J = 13.47 Hz); 3.66–3.73 (2H, $CH_2N(Bn)_2$, AB system, J = 14.64 Hz); 4.06–4.52 (2H, 4,5-dihydrooxazole, AB system, J = 8.92 Hz); 4.45–4.53 (2H, CH_2-triazole, AB system, J = 14.10 Hz); 7.18–7.91 ($15H_{arom}$, m); 7.61 ($1H^5_{1,2,3\text{-triazole}}$, s).

^{13}C-NMR (Bruker, 75.47 MHz; $CDCl_3$): δ (ppm) 25.1 (1C, $\underline{C}H_3$); 47.6 (1C, $\underline{C}H_2N(Bn)_2$); 57.3 (2C, dibenzyl); 57.4 (1C, 4,5-dihydrooxazole); 70.7 (1C, $\underline{C}H_2$-triazole); 74.7 (1C, $\underline{C}H_2$(4,5-dihydrooxazole)); 132.0 and 150.3 (2C, C^4 and C^5 of 1,2,3-triazole); 124.6–139.5 ($18C_{arom}$); 164.6 (1C, $\underline{C}$=N of 4,5-dihydrooxazole).

Anal. calcd. for $C_{28}H_{29}N_5O$: C, 74.47%; H, 6.47%; N, 15.51%. Found: C, 74.87%; H, 6.18%; N, 15.11%.

MS (EI): *m/z* (rel. int. %) = 451 (100%) (M^+).

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11. Description of the minority compound: Yellow oil; R_f (ether) = 0.63. ^{1}H-NMR (Bruker, 300.13 MHz, $CDCl_3$): δ (ppm) 1.30 (3H, CH_3, s); 3.46–3.56 (4H, dibenzyl, AB system, J = 13.45 Hz); 3.63–3.92 (2H, $CH_2N(Bn)_2$, AB system, J = 14.49 Hz); 5.04–5.65 (2H, 4,5-dihydrooxazole, AB system, J = 8.91 Hz); 6.46 (2H, CH_2-triazole, s); 7.06–7.91 ($15H_{arom}$, m); 7.58 ($1H^4_{1,2,3\text{-triazole}}$, s). ^{13}C-NMR (Bruker, 75.47 MHz; $CDCl_3$): δ (ppm) 25.1 (1C, $\underline{C}H_3$); 46.7 (1C, $\underline{C}H_2N(Bn)_2$); 55.1 (1C, 4,5-dihydrooxazole); 58.3 (2C, dibenzyl); 71.2 (1C, $\underline{C}H_2$-triazole); 75.5 (1C, $\underline{C}H_2$(4,5-dihydrooxazole)); 131.7 and 150.0 (2C, C^4 and C^5 of 1,2,3-triazole); 127.0–138.3 ($18C_{arom}$); 164.0 (1C, $\underline{C}$=N of 4,5-dihydrooxazole). MS (EI): *m/z* (rel. int. %) = 451.2 (100%) (M^+).