

LETTERS  
TO THE EDITOR

## Unexpected Formation of Ethyl 5-Cyano-6-[cyano(4'-phenyl-1,3'-selenazol-2-yl)methyl]-4-(furan-2'-yl)-2-methyl-1,4-dihydropyridine-3-carboxylate

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2-Furfurylidene acetoacetic ester **I** condensed with cyanoselenoacetamide **II** in the presence of *N*-methylmorpholine to give *N*-methylmorpholinium 6-methyl-4-(fur-2'-yl)-3-cyano-5-ethoxycarbonyl-1,4-dihydropyridine-2-selenolate [1].

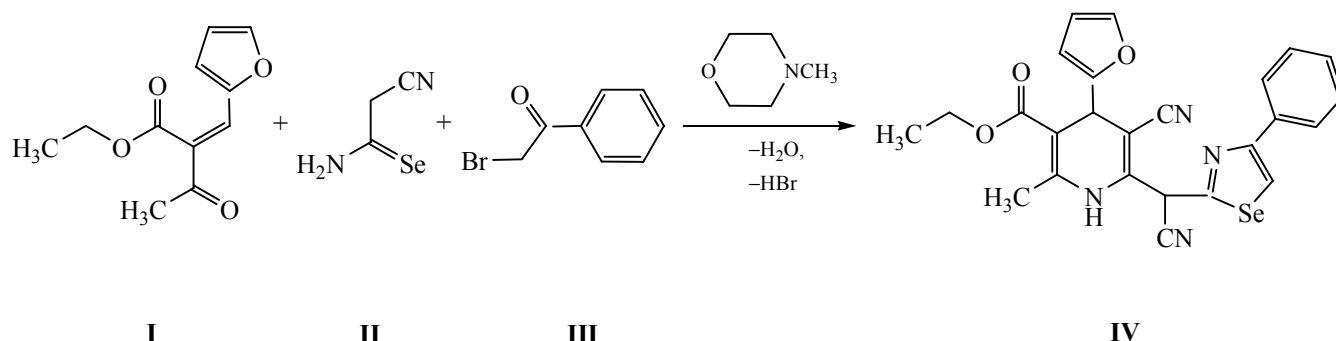
Involving an alkyl halide into this condensation opens a way to the previously unknown 7-alkylseleno-5-amino-2-methyl-4-(fur-2'-yl)-8-cyano-3-ethoxycarbonyl-1,4-dihydro-1,6-naphthyridines [2].

We found for the first time that the reactions of 2-furfurylidene acetoacetic ester **I** with cyanoselenoacetamide **II**, phenacyl bromide **III**, and *N*-methylmorpholine afforded ethyl 2-methyl-4-(fur-2'-yl)-5-cyano-6-[cyano(4'-phenyl-1',3'-selenazol-2'-yl)methyl]-1,4-dihydropyridine-3-carboxylate **IV**.

We are studying the applicability of this reaction, its mechanism and chemical-biological properties of compound **IV**.

**Ethyl 2-methyl-4-(furfur-2'-yl)-5-cyano-6-[cyano(4'-phenyl-1',3'-selenazol-2'-yl)methyl]-1,4-dihydro-**

**pyridine-3-carboxylate (IV)**. To a stirred solution of 1.04 g (5 mmol) of furfurylidene acetoacetic ester **I** in 20 ml of anhydrous ethanol was added 1.47 g (10 mmol) of cyanoselenoacetamide **II** and 1.05 ml (10 mmol) of *N*-methylmorpholine at 20°C under argon atmosphere. The reaction mixture was stirred for 10 min, then 1.0 g (5 mmol) of phenacyl bromide **III** was added, and the mixture was stirred for 30 min and left standing. After 2 days it was diluted with equal volume of water. The resin obtained was decanted, washed with water, and recrystallized from AcOH. Yield 1.71 g (68%), mp 203–205°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3302 (NH), 2175, 2250 ( $\text{C}\equiv\text{N}$ ), 1700 ( $\text{C}=\text{O}$ ).  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 1.31 t (3H,  $\text{CH}_3$ ,  $J$  6.19 Hz), 2.68 s (3H,  $3\text{CH}_3$ ), 4.23 q (2H,  $\text{OCH}_2$ ,  $J$  6.19 Hz), 4.66 s (1H, CH), 4.73 s (1H, CH), 6.17 d (1H,  $\text{H}^3$ , furyl,  $J$  2.94 Hz), 6.32 d.d (1H,  $\text{H}^4$ , furyl,  $J$  2.41 Hz), 7.32–7.51 m (4H, Ph and  $\text{H}^5$ , furyl), 7.89 d (2H, Ph,  $J$  7.02 Hz), 8.59 s (1H,  $\text{H}^5$ , selenazolyl), 12.24 br.s (1H, NH). Mass spectrum (EI, 70 eV),  $m/z$  ( $I_{\text{rel}}$ , %): 504 (19) [ $M+1$ ] $^+$ , 503 (8) [ $M$ ] $^+$ , 475 (7), 423 (28), 398 (7), 182 (44), 158 (19), 102 (100), 89 (18), 81 (52), 63



(17), 51 (14), 39 (26). Found, %: C 59.51; H 3.88; N 11.02.  $C_{25}H_{20}N_4O_3Se$ . Calculated, %: C 59.65; H 4.00; N 11.13.

The  $^1H$  NMR spectrum was registered on a Bruker AM-300 instrument (300.13 MHz) in  $DMSO-d_6$  relative to internal TMS. The mass spectrum was measured on a Kratos MS-890 spectrometer (70 eV) using a direct injection of a sample into the ion source.

The IR spectrum was recorded on a IKS-29 spectrophotometer in mineral oil.

#### REFERENCES

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2. Dyachenko, V.D., Roman, S.V., and Litvinov, V.P., *Izv. Akad. Nauk, Ser. Khim.*, 2000, no. 1, p. 121.