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SHORT COMMUNICATIONS

2,2,5,5-Tetra(hydroxymethyl)cyclopentanone in the Synthesis of New Types of Phospholipides

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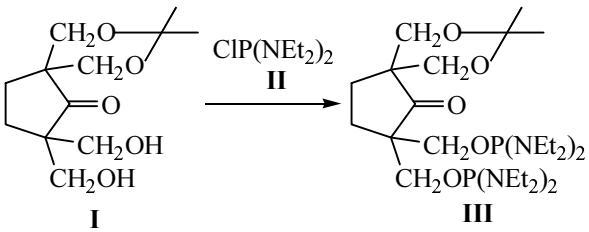
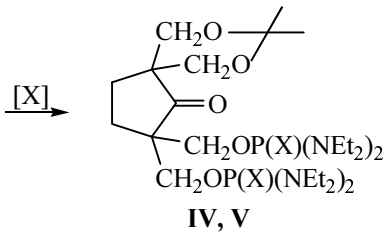
We performed a synthesis of new analogs of phospholipides starting from 2,2,5,5-tetra(hydroxymethyl)-cyclopentanone. The compounds obtained have structural resemblance to prostaglandins [1]. The easily available 7,7-di(hydroxymethyl)-3,3-dimethyl-6-oxo-2,4-dioxaspiro-[4.5]decene (**I**) that was prepared from 2,2,5,5-tetra(hydroxymethyl)cyclopentanone and acetone {yield 74%, mp 105–107°C, R_f 0.74, [chloroform–methanol, 3 : 1, (A), Silufol UV-254]. Found, %: C 58.92; H 8.16. $C_{12}H_{20}O_5$. Calculated, %: C 59.00; H 8.25} was phosphorylated with tetraethyldiamidophosphorous acid chloride **II** to furnish bis (diamido)phosphite **III**.

Compound **III** (δ_p 133.5 ppm) was without further purification treated with sulfur or selenium to afford the corresponding thion **IV** and selenodiamidophosphates **V** that were isolated by column chromatography on silica gel applying benzene as eluent. The yields of compounds **IV** and **V** attained 60%.



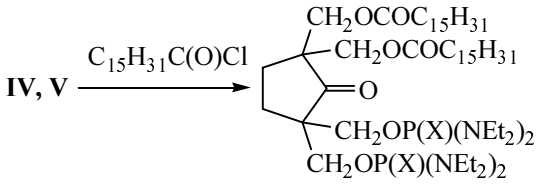
I **III**



IV, V

X = S (**VI**), Se (**V**).

The final stage of the synthesis consisted in direct acylation of compounds **IV** and **V** with palmitoyl chloride by procedure [2].



VI, VII

X = S (**VI**), Se (**VII**).

Dipalmitoyl derivatives **VI** and **VII** were purified by column chromatography on silica gel, eluent benzene. The compounds were obtained in a 53% yield.

Thione phosphate **IV**. Syrup-like fluid, δ_p 79.0 ppm, R_f 0.68 [benzene–dioxane, 5 : 1, (B)]. Found, %: C 51.15; H 8.93; N 8.60. $C_{28}H_{58}N_4O_5P_2S_2$. Calculated, %: C 51.20; H 8.89; N 8.53.

Selenone phosphate **V**. Syrup-like fluid, δ_p 82.5 ppm, satellites with a coupling constant $^1J_{P,Se}$ 848 Hz, R_f 0.68 (A). Found, %: C 44.68; H 7.87; N 7.58. $C_{28}H_{58}N_4O_5P_2Se_2$. Calculated, %: C 44.76; H 7.79; N 7.46.

Compound **VI**, mp 51–53°C, R_f 0.51 [hexane–dioxane, 5:1 (C)]. Found, %: C 61.63; H 10.69; N 5.33. $C_{55}H_{114}N_4O_7P_2S_2$. Calculated, %: C 61.76; H 10.74; N 5.24.

Compound **VII**, mp 44–46°C, R_f 0.51 (B). Found, %: C 56.61; H 9.86; N 4.94. $C_{55}H_{114}N_4O_7P_2Se_2$. Calculated, %: C 56.78; H 9.88; N 4.82.

^{1}H NMR spectra of solutions (*C* 0.5 mol/l) of compounds **I**, **IV–VII** in $CDCl_3$ were registered on

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spectrometer Mercury-300 (300 MHz). The assignment of proton signals was done with the use of double resonance spectra. The $^{31}P - \{^{1}H\}$ NMR spectra of solutions (1 mol/l) of compounds **III–VII** in benzene were recorded on spectrometer Bruker WP-80 SY (32.4 MHz),external reference 85% H_3PO_4.

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