

SHORT
COMMUNICATIONS

2-Alkyl-2-hydroxymethyl-1,3-propanediols
in the Synthesis of Phospholipids

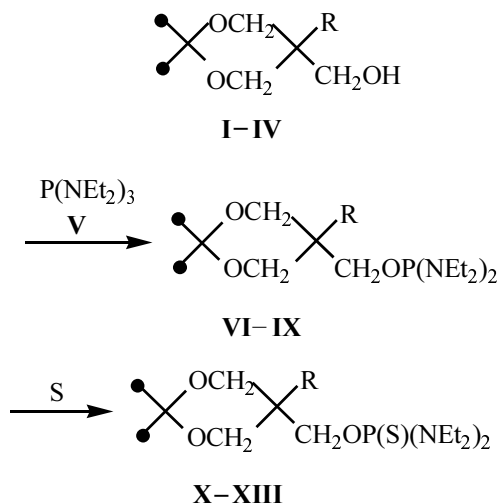
G.A. Savin and O.M. Kutsemako

Volgograd State Pedagogical University, Volgograd, 400131 Russia

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In extension of our studies on synthesis of lipids modified in the polyol fragment [1] we report here on preparation of previously unknown analogs of phosphatide acids basing on triols of general formula $RC(CH_2OH)_3$ where the *n*-alkyl rest contains from five to eight carbon atoms commensurable with the residues of fatty acids in the naturally occurring compounds.

As initial substances we used easily available isopropylidene derivatives of 2-alkyl-2-hydroxymethyl-1,3-propanediols (I–IV) that were first phosphorylated with hexaethylphosphoroustriamide (V) to obtain the corresponding diamidophosphites VI–IX.



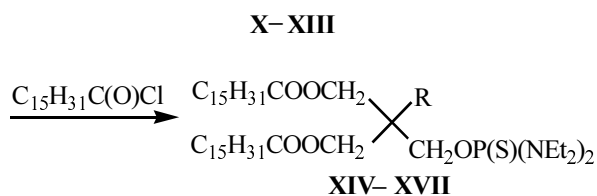
R = C₅H₁₁ (X, XIV); C₆H₁₃ (XI, XV); C₇H₁₅ (XII, XVI); C₈H₁₇ (XIII, XVII).

The reactions were carried out without solvent at 90–100°C with distilling off the arising diethylamine under slightly reduced pressure (380 mm Hg.). The formation of diamidophosphites VI–IX was monitored by ³¹P NMR spectroscopy (phosphorus atoms resonance in compounds VI–IX was observed as singlets in the region

134 ppm] and by TLC { phosphites VI–IX had R_f 0.4 [benzene–dioxane, 10:1 (A)], Silufol UV-254 }.

Diamidophosphites VI–IX further without preliminary purification were converted into thionephosphates X–XIII that were isolated by column chromatography on alumina using benzene as eluent. Yield of compounds X–XIII attained 65%. Diamidothionephosphates X–XIII: n_D²⁰ 1.4870 (X), 1.4872 (XI), 1.4874 (XII), 1.4886 (XIII); δ 78–79 ppm; R_f 0.6 (A).

Finally the phosphoacetals X–XIII were brought into reaction of direct acylation with palmitoyl chloride by procedure [2].



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Diacyl derivatives XIV–XVII were purified by column chromatography on silica gel with benzene for eluent. Their yield amounted to 52%.

Compound XIV, mp 30–32°C, R_f 0.4 [hexane–dioxane, 10:1 (B)]. Found, %: C 68.26; H 11.58; N 3.28; P 3.58. C₄₉H₉₉N₂O₅PS. Calculated, %: C 68.48; H 11.61; N 3.26; P 3.60.

Compound XV, mp 36–38°C, R_f 0.4 (B). Found, %: C 68.59; H 11.65; N 3.22; P 3.50. C₅₀H₁₀₁N₂O₅PS. Calculated, %: C 68.76; H 11.66; N 3.21; P 3.55.

Compound XVI, mp 41–43°C, R_f 0.4 (B). Found, %: C 68.88; H 11.63; N 3.15; P 3.43. C₅₁H₁₀₃N₂O₅PS. Calculated, %: C 69.03; H 11.70; N 3.16; P 3.49.

Compound **XVII**, mp 44–45°C, R_f 0.4 (B). Found, %: C 69.11; H 11.69; N 3.08; P 3.40. $C_{52}H_{105}N_2O_5PS$. Calculated, %: C 69.28; H 11.74; N 3.11; P 3.44.

1H NMR spectra of solutions (c 0.5 M) of compounds **I–IV** and **X–XVII** in $CDCl_3$ were registered on spectrometer Bruker WM-250 (250 MHz). The assignment of signals in the 1H NMR spectra were done with the use of double resonance technique. ^{31}P - $\{^1H\}$ NMR spectra of solutions (C 1 M) of compounds **VI–XVII** in benzene

were taken on spectrometer Bruker WP-80SY (32.4 MHz), external reference 85% H_3PO_4 .

REFERENCES

1. Savin, G.A., Kamneva, E.A., and Nifant'ev, E.E., *Zh. Org. Khim.*, 2003, vol. 39, p. 1113.
2. Nifant'ev, E.E. and Predvoditelev, D.A., *Usp. Khim.*, 1997, vol. 66, p. 47.