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LETTERS TO THE EDITOR

2,2,6,6-Tetra(hydroxymethyl)cyclohexanol in the Synthesis of New Types of Phospholipids

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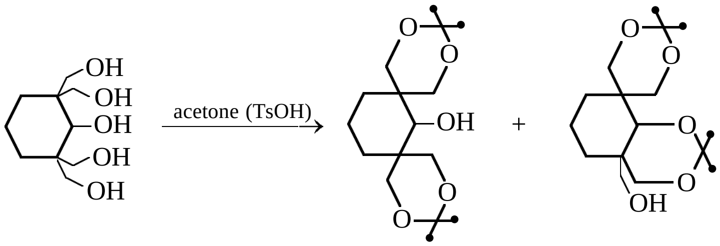
Continuing studies on the methods of synthesis of nonglycerol polyol phospholipids, based on trivalent phoshorus compounds and phosphorus(V) cyclic systems [1, 2], we for the first time prepared phospholipids derived from readily available 2,2,6,6-tetra(hydroxymethyl)cyclohexanol (**I**). Cyclic polyol **I** was reacted with acetone in acidic medium to obtain isopropylidene derivatives **II** and **III**.



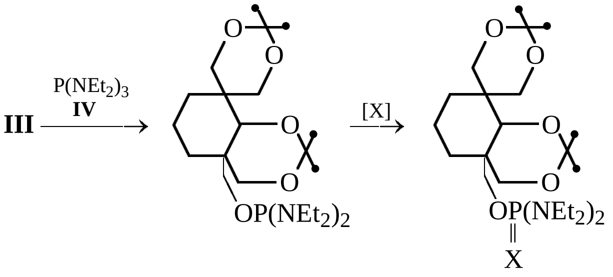
I **II** **III**

The yield of compound **II**, mp 92–93°C, R_f 0.48 [Silufol UV-254; hexane–dioxane, 5 : 1 (system A)], did not exceed 5%; therefore, in further syntheses of phospholipids we used compound **III** only. Protected polyol **III** was purified by triple crystallization from heptane, yield 65%, mp 111–112°C, R_f 0.38 (system A).

Diisopropylidene derivative **III** was phosphorylated with hexaethylphosphorous triamide (**IV**) at 90–100°C with removal of the evolving diethylamine at reduced pressure (380 mm). Crude phosphorodiamidite **V**, δ_P 134.5 ppm, R_f 0.6 [hexane–dioxane, 10 : 1 (system B)], was converted to thio- and selenoamidophosphates **VI** and **VII** which were purified by crystallization from pentane.

Thioamidophosphate **VI**, yield 60%, mp 91–92°C, δ_P 79.3 ppm, R_f 0.4 (system B).

Selenoamidophosphate **VII**, yield 75%, mp 101–102°C, δ_P 80.2 ppm, R_f 0.4 (system B).



V **VI, VII**

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

Phosphoacetals **VI, VII** were directly acylated with myristoyl and stearoyl chlorides at 20°C according to [3]. The yield of tetraacylamidophosphates **VIII**–**XI** after purification on a silica gel column (eluent hexane) was 55%.

Tetramyristoylthioamidophosphate **VIII**, mp 39–

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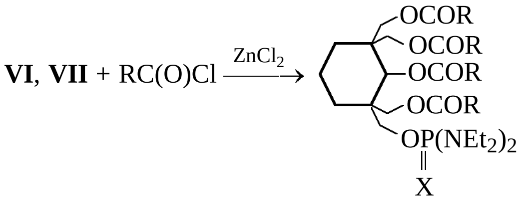

VIII–XI

R = $C_{13}H_{27}$, X = S (**VIII**); R = $C_{13}H_{27}$, X = Se (**IX**); R = $C_{17}H_{35}$, X = S (**X**); R = $C_{17}H_{35}$, X = Se (**XI**).

40°C, R_f 0.52 (system B); tetramyristoylselenoamidophosphate **IX**, mp 44–45°C; R_f 0.8 (system A); tetrastearoylselenoamidophosphate **XI**, mp 61–62°C; R_f 0.8 (system A).

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