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SYNTHESIS OF SOME CYCLIC ALKOXYALKYL SUBSTITUTED ORGANOPHOSPHORUS COMPOUNDS

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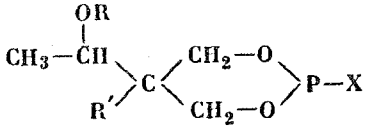
Continuing the expansion of research in the field of the chemistry of alkoxy compounds, syntheses of hitherto undescribed alkoxyalkyl substituted organophosphorus compounds have been effected. The route was reaction of 2-alkyl-2-α-alkoxyethylpropanedioles-1, 3 (I) [1] with phosphorus trichloride (II) in the presence of amines [2], and also reaction of I with dichloroethylphosphite III in the presence of pyridine [3].

Reaction of I with II gave the hitherto undescribed 2-chloro-5-alkyl-5-α-alkoxyethyl-1, 3, 2-dioxaphosphorinanes (IV) and reaction of I with III gave 2-ethoxy-5-alkyl-5-α-alkoxyethyl-1, 3, 2-dioxaphosphorinanes (V), also not previously described. Furthermore, one of the phosphorinanes IV, viz., 2-chloro-5-isopropyl-5-α-isopropoxyethyl-1, 3, 2-dioxaphorphorinane, was converted, by treatment with methanol in the presence of triethylamine, into the hitherto undescribed 2-methoxy-5-isopropyl-5-α-isopropoxyethyl-1, 3, 2-dioxaphosphorinane (VI).

The table gives the properties of IV, V, and VI. Their structures are confirmed by their PMR spectra, to be published later.

2-Substituted 5-Alkyl-5-α-Alkoxyethyl-1, 2, 3-Dioxaphosphorinanes



R	R'	X	Bp, °C (pressure mm)	d_4^{20}	n_D^{20}	Formula	P, % Found	P, % Calculated	Yield, %
CH_3	CH_3	Cl	63 (0.02)	1.1940	1.4700	$C_8H_{14}ClO_3P$	14.83	14.58	30
CH_3	i-C_3H_7	Cl	62.5 (0.01)	1.1714	1.4810	$C_9H_{18}ClO_3P$	13.06	12.88	47
i-C_3H_7	i-C_3H_7	Cl	80–82 (0.02)	1.1256	1.4742	$C_{11}H_{22}ClO_3P$	11.66	11.54	87
CH_3	i-C_3H_7	OC_2H_5	76 (0.03)	1.0711	1.4596	$C_{11}H_{23}O_4P$		12.40	33
i-C_3H_7	i-C_3H_7	OCH_3	67 (0.02)	1.0837	1.4668	$C_{12}H_{25}O_4P$	12.40	11.74	40
i-C_3H_7	i-C_3H_7	OC_2H_5	70 (0.02)	1.0388	1.4578	$C_{13}H_{27}O_4P$	11.20	11.15	50

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REFERENCES

1. G. V. P'yankova, A. A. Kolesnik, and A. V. Bogatskii, ZhOKh, 34, 1200, 1964.
2. A. E. Arbuzov and V. M. Zoroastrova, Izv. AN SSSR, OKhN, 779, 1952.
3. A. E. Arbuzov and V. M. Zoroastrova, Izv. AN SSSR, OKhN, 770, 1952.

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