

TABLE I
Component esters of solid(s) and liquid(L) acid fractions

Fractions	Wt. (gm.),	B.P. °C.	Palmitic	Stearic	Oleic	Linoleic
Solid (s)*						
S ₁	2.61	80-120	2.42	0.17	0.02	..
S ₂	2.79	120-132	2.28	0.47	0.04	..
S ₃	3.32	132-142	2.50	0.63	0.19	..
S ₄	3.40	142-152	2.29	0.76	0.35	..
S ₅	3.49	152-157	1.36	0.70	0.43	..
Liquid (L)†						
L ₁	4.39	80-130	0.57	0.50	1.67	1.65
L ₂	3.24	130-140	0.21	0.26	1.39	1.38
L ₃	3.60	140-145	0.16	0.22	1.62	1.60
L ₄	3.59	145-148	0.13	0.20	1.64	1.62
L ₅	3.28	148-falling	0.10	0.15	1.52	1.51
Total wt. of solid acids ester (15.61 gm.)			10.85	3.73	1.0	..
*Percentage as esters			69.56	23.89	6.59	..
Percentage as acids			69.30	23.94	6.63	..
†Total wt. of liquid acids esters (18.10 gm.)			1.17	1.33	7.87	7.76
Percentage of esters			6.46	7.34	43.31	42.87
Percentage as acids			6.37	7.32	43.52	42.87
Overall percentage of acids			31.54	14.05	28.76	25.72
R _f values over reserved phase chromatograms			0.58	0.60	0.20	0.26

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CONTRIBUTION OF IRON AND ALUMINIUM IN PHOSPHATE SORPTION BY ALKALINE SOILS

IMPORTANCE of the role of iron and aluminium in phosphate sorption by acid soils has been demonstrated by many workers. The most direct argument is based on observations that phosphate sorption is reduced markedly when

both oxides are removed by chemical extraction.^{1,2}

The importance of these oxides in phosphate sorption by alkaline soils has not been realized so far. The fractionation studies by modified Chang and Jackson's method indicated that these soils also contain large amounts of iron and aluminium phosphates.³ To assess the relative contribution of iron and aluminium in phosphate sorption in these soils and their effect on the forms of phosphorus, following study was carried out.

Six representative surface samples were selected for the study. The physical and chemical composition of these soils has already been reported.⁴ These soils can be broadly classified into two groups, those containing more CaO and those containing less CaO.

The relevant data for one soil from each group is presented in Table I. The results for other soils are more or less identical.

TABLE I
Showing phosphate sorption capacities and forms of phosphorus before and after removal of oxides of iron

Soils	Phosphate sorption capacity		Forms of phosphorus							
	A	B	Al-P		Fe-P		Ca-P		Occluded-P	
			A	B	A	B	A	B	A	B
Akola	890	435 (51)	172	76 (44)	8	17	216	234	4	1
Sakoli	456	250 (55)	183	103 (56)	73	74	74	15	6	4

A—Before removal, B—After removal, mgm P₂O₅/100 gm. of soil (on oven-dry basis).
Figures in brackets indicate the percentage reduction.

It has been observed that there is a considerable reduction in phosphate sorption capacities of these soils on removal of iron, ranging from 16 to 72%. Fractionation studies indicate that there is a reduction in aluminium bound phosphorus to the extent of 50% and no effect on other forms on removal of iron. Though the method of removal of iron is not specific and some amount of aluminium is also removed,⁵ still the reduction in sorption capacity and aluminium bound phosphorus cannot account for the small amount of aluminium removed.

The conclusion drawn from the results with these soils is that the phosphate sorption in these soils is also considerably dominated by aluminium and not by iron. Presence of iron has an activating effect in sorption of phosphate by aluminium.

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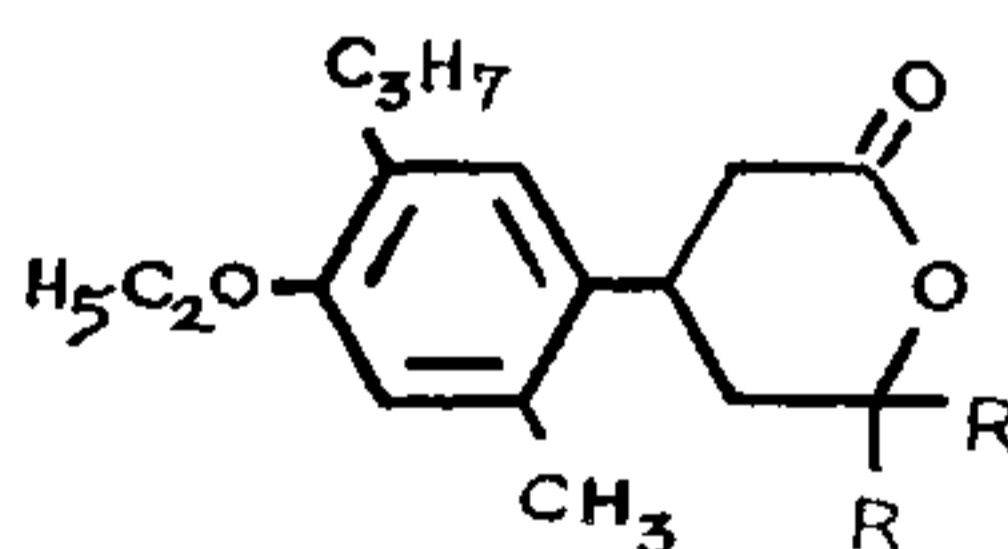
SYNTHESIS OF 3-(2'-METHYL-4'-ETHOXY-5'-ISOPROPYLPHENYL)-5, 5-DISUBSTITUTED VALEROLACTONES

IN continuation of our work on substituted valerolactones as possible anthelmintics,¹ synthesis of 3-(2'-methyl-4'-ethoxy-5'-isopropylphenyl)-5, 5-disubstituted valerolactones was undertaken.

Various alkyl and aryl Grignard reagents were condensed with 3-(2'-methyl-4'-ethoxy-5'-isopropylphenyl)-glutaric anhydride² following the procedure of Weizmann³ when valerolactones of the type I were obtained. Formation of I was confirmed through their elemental analysis and IR spectral studies. The physical characteristics of these valerolactones are described in Table I.

To a solution of one mole of anhydride in dry benzene, an ethereal solution of two moles of Grignard reagent was added with stirring and after the completion of addition, solvent ether was removed and the mixture was refluxed for 20 hr. The reaction mixture was then hydrolysed with ice and hydrochloric acid, extracted with ether, washed well with water and dried over anhydrous sodium sulphate. The extract upon concentration and subsequent crystallization or distillation gave desired valerolactones.

TABLE I
General formula for lactones



I

Comp. No.	R	m.p./b.p. °C.	Yield %	Molecular formula	Composition %			
					Carbon		Hydrogen	
					Calcd.	Found	Calcd.	Found
1	Methyl	.. 119-120	39	C ₁₉ H ₂₈ O ₃	74.96	75.16	9.27	9.90
2	Ethyl	.. 105-106	40	C ₂₁ H ₃₂ O ₃	75.88	75.28	9.71	9.98
3	n-Butyl	.. 238-240/0.8 mm.	23	C ₂₅ H ₄₀ O ₃	77.27	77.97	10.38	10.04
4	Allyl	.. 220-222/0.5 mm.	17	C ₂₃ H ₃₂ O ₃	77.50	77.28	9.05	9.12
5	Phenyl	.. 238-240/0.7 mm.	34	C ₂₉ H ₃₂ O ₃	81.27	81.06	7.53	7.52
6	Benzyl	.. 106-107	24	C ₃₁ H ₃₆ O ₃	81.53	81.28	7.95	7.33
7	Anisyl	.. 176-178/0.4 mm.	Traces	C ₁₃ H ₃₆ O ₅	76.21	75.83	7.43	7.56