

We are at present examining the effect of solvent environment on C—halogen frequencies. In general, as might be anticipated for a dipole the end of which most readily available for association is of the same sign, these follow the same overall pattern of solvent behaviour as that exhibited by C=O. The relative shift is also of the same order as for C=O, but a theoretical breakdown of this into the various contributions leads us to the conclusion that with these dipoles the dipolar interaction and dielectric factors play almost equal parts. The most striking outcome is the reasonable success of the KBM treatment, a typical example being shown in Fig. 1*a*, which also includes typical examples of an N—H frequency (Fig. 1*c*), taken from the data of Josien *et al.*⁵, and extended by us¹, and a carbonyl frequency (Fig. 1*b*) plotted from the data of Bellamy *et al.*², with some additional points from these laboratories. It is immediately apparent that C—halogen KBM plots represent the most satisfactory plots to date of this function. Our analysis in terms of Buckingham's theory³ as extended by Caldow and Thompson³ enables us to account for the deviations from the KBM relationship which are found with highly polar solvents such as dimethyl formamide and dimethyl sulphoxide, in terms of specific dipolar interactions.

It is clear that in the development of theories of solvent effects it must be appreciated that neither of the two major factors which contributes to infra-red solvent shifts can be ignored, and that their relative significance varies from case to case, being dependent as much on the particular dipole absorber as on the solvent medium itself.

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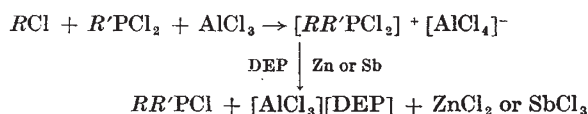
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A New Synthetic Route to Dialkylphosphinous Chlorides

PREPARATIVE methods for dialkylphosphinous chlorides are few in number, and frequently give unsatisfactory yields or require techniques unsuitable for such problems as the synthesis of radioactively labelled compounds of high activity¹⁻³. A recently described reaction for the preparation of alkylphosphonous dichlorides⁴ has been shown to be adaptable to the preparation of dialkylphosphinous chloride in a single-flask reaction with good yield.

It has been found that alkylphosphonous dichlorides will form a complex with aluminium chloride and an

alkyl halide in the same manner as does phosphorus trichloride⁵. Solution of this complex in an electron-donating solvent, for example diethyl phthalate (DEP), followed by reduction with powdered antimony or, preferably, powdered zinc, gives good yields of dialkylphosphinous chloride on distillation.



The mixed and symmetrical products prepared by this route are given in Table 1.

Table 1

Compound	b.p./mm.	<i>n</i> _D ²⁰	Yield (per cent)
(CH ₃) ₂ PCl	70/690	—	45
(<i>i</i> -C ₃ H ₇) ₂ PCl	69/33	1.4745 ⁽²³⁾	68
(C ₂ H ₅) ₂ PCl	92/4	1.4771 ⁽²⁴⁾	46
(CH ₃)(C ₂ H ₅)PCl	67/98	1.5140 ^(25,26)	73
(CH ₃)(ClCH ₂)PCl	90/100	—	41
(CH ₃)(<i>i</i> -C ₃ H ₇)PCl	82-85/208	—	66
(C ₂ H ₅) ₂ PCl	76/22	—	22

Full details will be reported elsewhere.

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BIOCHEMISTRY

Uptake of Deoxyribonucleic Acid (DNA) : a Special Property of the Cell Nucleus

ACCORDING to the concept of metabolic stability, DNA is synthesized only before cell division and during the formation of polyploid nuclei. Thus the incorporation of labelled precursors is generally considered to be a measure of DNA synthesis and, consequently, of proliferative activity of the cell population in question.

In the light of recent findings, this assumption does not have absolute validity. Pelc has observed incorporation of adenine-¹⁴C and ³H-thymidine into the epithelium of the vesica seminalis in amounts exceeding by 20-80 times the DNA value required for cell division^{8,9}. He interprets his findings as metabolic activity of DNA connected with some cellular functions of non-growing differentiated epithelium¹⁰. In the case of phosphorus, however, no exchange was found in the DNA of single non-dividing cells^{5,6}.

I have observed DNA labelling in resting cells of bone marrow, thymus and spleen after transfusion of homologous lymphocytes labelled with phosphorus-32. Control experiments using phosphorus-32 as inorganic phosphate were mostly negative, and thus the possibility of metabolic exchange of phosphorus-32 in the DNA molecule itself was excluded⁴. It is therefore assumed that the resting cells of the recipient took up the whole DNA-phosphorus-32 or a large part of it from nuclear debris of injected donor cells.