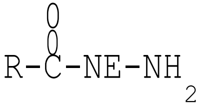
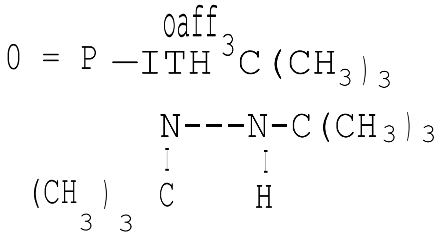
SUMMARY

Hydrazides and their derivatives of the general formula  $R-\overset{\overset{O}{\|}}{C}-NE-NH_2$ have important applications as monoamino oxidase inhibitor (M.O.A.I.) acd form a new class of therapeutic agent in the treatment of mental depression beside their toxiphoric character.

OrganophoophoruS compounds are toxic because of their inhibition for cholinesterase enzyme.

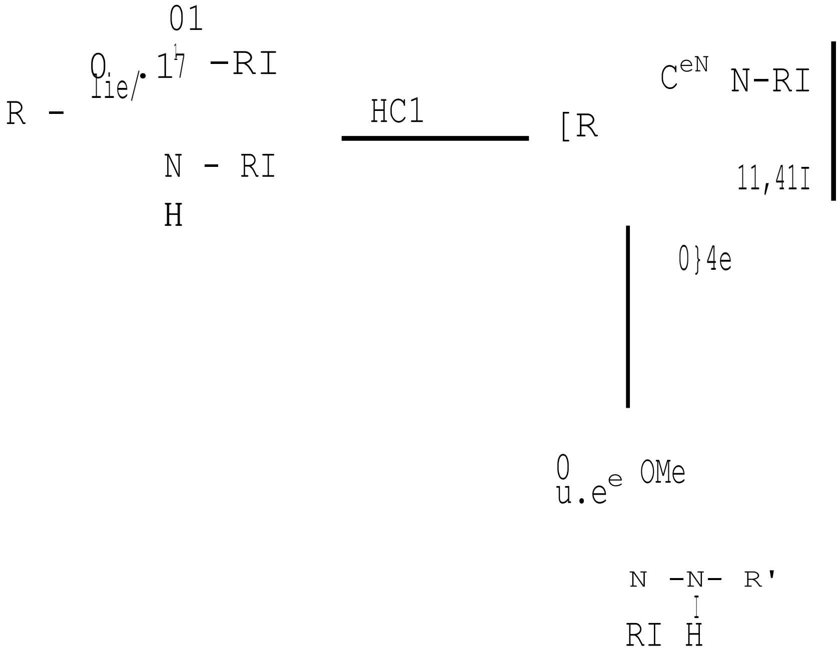
The aim of the present work is to synthesize organophosphorus hydrazides having expected M.O.A.I. and which may have important biological applications.

Phosphorus hydrazides were prepared from phosphoramide through a new technique by treating the latter with tertiary butyl hypochlorite ae 8 chlorinating agent where N-chloramide derivatives obtained were rearranged through the treatment with alkali alkoxide. This reaction *was* generalised to be a new type of rearrangement and the mechanism of this reaction is discussed. The process of rearrangement could be illustrated by the following equation:



VIII b

The reaction mechanism is suggested to proceed according to the scheme:-



This mechanism is suggested through the separation of azobenzene from the reaction product of N-chloramide of dianilino methyl phosphine oxide with sodium methoxide where the electron attraction of the phenyl group attached to the nitrogen leads to separation of azobenzene.

The phosphorus hydrazides that failed to be prepared by the rearrangement were prepared by the reaction of the respective phosphorochloridate and hydrazine or its substituted derivatives in presence of triethylamine as hydrogen chloride acceptor. The prepared compounds are 0-methyl phosphor° hydrazide (compound 0..methyl methyl phosphoro phenyl hydrazide (compound V) 0•methyl methyl phosphoro benzyl hydrazide (compound VI), tert. butyl phosphor° phenyl hydrazide (compound Ii), 0-methyl tert.butyl phosphorohydrazide (compound X) and 0-methyl-tert. butyl phosphoro benzyl hydrazide (compound XI).

Moreover 0-methyl tert. butyl phosphor° ohloridate was prepared by a new method through the treatment of tert-butyl phosphanic dichloride with sodium methoxide.

Besides, the failure in obtaining N-chloramide of methyl phosphonic diamide (compound III) is eXplained to be due to the absence of sterioally hindered group should be attached to the nitrogen of the phosphoramide.

Another group of phosphorus compounds are also prepared (compound XIII, XIV, IV, XVI) and their sulphur analogous (compound XVII, XVIII, XIX, XX) of expected amino oxidase activity.

The obtained compounds were evaluated through their elemental analysis, IR spectra,. N.V. spectra, mass spectroscopy, N.M.R. spectra, Gas liquid chromatography, melting point and mixed melting point.

The biological activity of some prepared phosphorus-Nitrogen compounds were also evaluated and it is found that 0-methyl sym. tent. butyl hydrazine phenyl phosphonic oxide (compound VII b) and 0-methyl P-phenyl - N-methyl 3-piperidinophosphonothioate (compound XIX) were found to be active against some harmful bacteria for the studied period.

The second part includes a kinetic study for the phosphorylation of cellulosic fabrics for obtaining fireproofing fabrics. The optimum conditions far phosphorylating cellulosic fabric with five different organophosphorous compounds and their effect on the yield of pliosphorylated product are evaluated.

The effect of phosphorylation on both tensile strength and flame retardance are also evaluated.

In the first series of experiments stoohiometric quantities of pyridine were used in non polar high boiling solvent as monochlorobenzene as reaction medium. The values of percent increase in weight follow the following sequence of organophosphorous compound phenyl dichlorophosphine oxide III <Di(2-chloroethoxy)phosphoryl chloride II .< N,N dimethyl amino phosphoryl dichloride IV 4,/, diethyl phosphorochloridate I < phenyl phosphonothioic dichloride V.

The kinetic of the reaction was found to be first order reaction. The value of activation energy E and iSH I AF, and AS were calculated.

Using pyridine both as a solvent and as hydrogen chloride acceptor to avoid the failure in tensile strength of the cellulosic fabrics second series of experiments were carried out. The reaction was found to be first order reaction in pyridine and the values of above mentioned thereta functions are also calculated.

The obtained decrease the tensile strength (as expected) of the fabrics in the second run ranges from 62.8 to 34.2 The flameproof resistance data of textile fabrics illustrates that Di(2-chloroethoxy)phosphoryl chloride.(II) gives best results as a flameproofing accompanied with moderate tensile strength value.