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Synthesis and spectroscopic characterization of a new amidophosphoester, $(CH_3CH_2O)_2P(O)NH(C_6H_{10})NHP(O)(OCH_2CH_3)_2$

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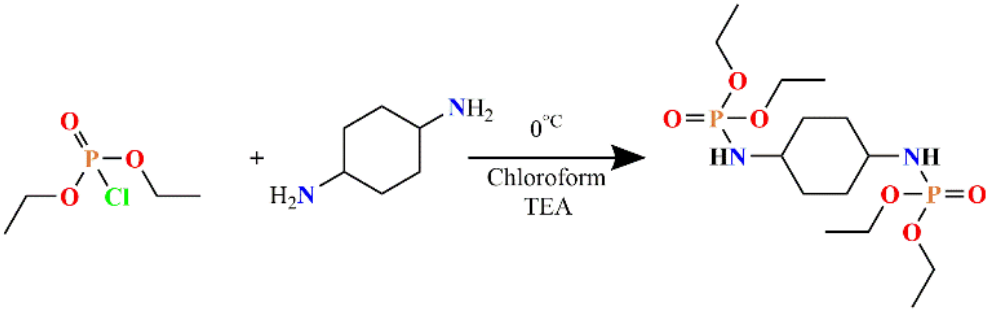
The phosphoramide compounds have been the focus of researchers for a long time, due to manifold applications, especially in medicine, agriculture, and preparation of flame retardants[1]. According to the different applications of these compounds, synthesis methods have been developed, including the reaction of amines with phosphoryl halides[2].

A new amidophosphoester, $(CH_3CH_2O)_2P(O)NH(C_6H_{10})NHP(O)(OCH_2CH_3)_2$, was prepared from the reaction of $(CH_3CH_2O)_2P(O)Cl$ reagent and trans1,4-diaminocyclohexane (2:1 mole ratio, in the presence of $N(C_2H_5)_3$) in dry chloroform (Scheme). The product was characterized by IR, ^{1}H-NMR, ^{13}C-NMR, and ^{31}P-NMR spectroscopies.

In the IR spectrum, the bands centered at 3201 and 1211 cm^{-1} are attributed to the NH and P=O stretching frequencies. The phosphorus signal appears at 8.84 ppm, which is in the range of analogous compound[3]. The phosphorus-hydrogen and phosphorus-carbon coupling constants of the title compound are reported.



Scheme: Synthesis route of tetraethyl cyclohexane-1,4-diylbis(phosphoramidate).

References

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