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A New Approach to Producing Metaphosphates and Phosphorylating in Mild Conditions

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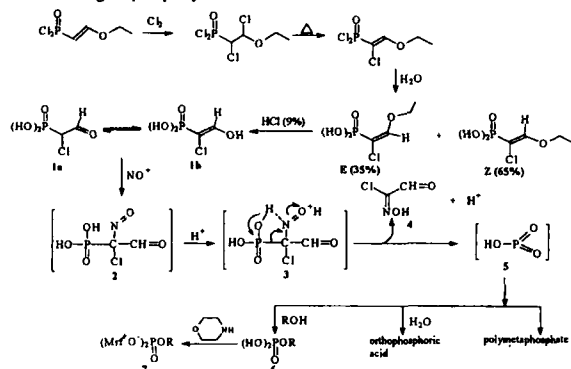
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A New Approach to Producing Metaphosphates and Phosphorylating in Mild Conditions

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The formation of monomeric metaphosphate has been postulated before, mainly in pyrolytic [1,2] or photolytic [3] fragmentation reactions. Meantime, these reactive intermediates are presumed to participate in the processes of electrophilic phosphorylation in living organisms [4]. In this connection it is reasonable that an active interest is being shown in the development of methods of generating metaphosphates in mild conditions [4-7] compatible with biological systems in order to simulate biological phosphoryl-transfer reactions.



We now report a novel means of phosphorylating in mild conditions whereby metaphosphate 5 is evolved under dihydroxyphosphorylacetaldehyde 1 nitrosation. The reaction proceeds with the C-P bond-breaking and leads to the formation of chloroglyoxal monooxime 4 and monomeric metaphosphate 5, which when reacting in water forms orthophosphoric acid and in alcoholic medium it phosphorylates the respective alcohols to the phosphomonoesters 6 isolated as salts 7. Observed fragmentation is probably initiated by acids when oxygen of nitroso group in intermediate 2 is protonated with following cleavage of P-C bond.

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