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Alternative Trends of Organophosphorus Compound Condensation in Triple Systems and Hydride Transfer Reactions

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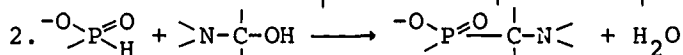
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ALTERNATIVE TRENDS OF ORGANOPHOSPHORUS COMPOUND CONDENSATION IN TRIPLE SYSTEMS AND HYDRIDE TRANSFER REACTIONS

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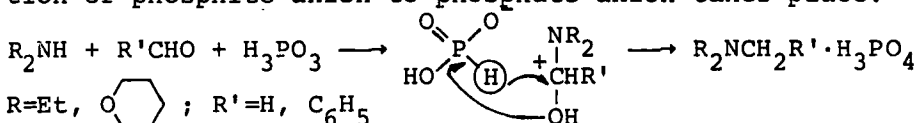
While investigating the reaction mechanism in the triple system $\overset{+}{\text{N}}\text{H}_4\text{X}^- + \text{CH}_2\text{O} + \text{H}_3\text{PO}_3$, much attention was paid to determining the stages of the interaction which can be presented as follows: 1. $\text{>NH} + \text{>C=O} \rightleftharpoons \text{>N}-\overset{|}{\underset{|}{\text{C}}}-\text{OH} \rightleftharpoons [\text{>N}-\overset{|}{\underset{|}{\text{C}}}^+ \longleftrightarrow \text{>}\overset{|}{\underset{|}{\text{N}}}=\overset{|}{\underset{|}{\text{C}}}\text{OH}]$



The mechanism of the stage (2) and the possible alternative processes have not been sufficiently developed. If phosphite-anion is present in the system, one might assume that hydrogen attached to phosphorus can be involved in the hydride transfer reactions:



Indeed, the reactions of ammonium salts of phosphorous acid with aldehydes in aqueous media result in ammonium salts of phosphoric acid, i.e. the reduction of the intermediately formed α -oxymethylamine to tertamine occurs and the oxidation of phosphite-anion to phosphate-anion takes place.



These results are in good agreement with those obtained during the investigation of the condensation in the system:

