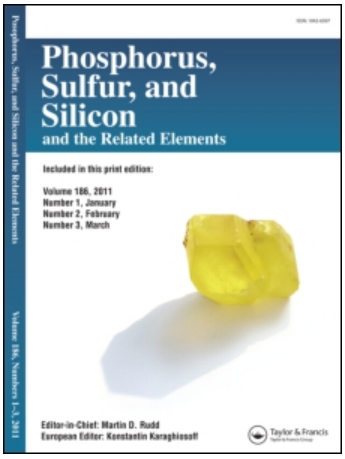

Phosphorus, Sulfur, and Silicon and the Related Elements

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

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

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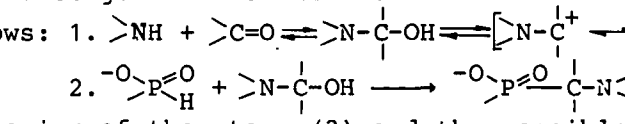
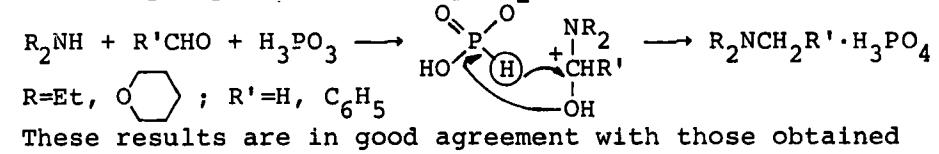
While investigating the reaction mechanism in the triple system $\overset{+}{N}H_4X^- + CH_2O + H_3PO_3$, much attention was paid to determining the stages of the interaction which can be presented as follows:



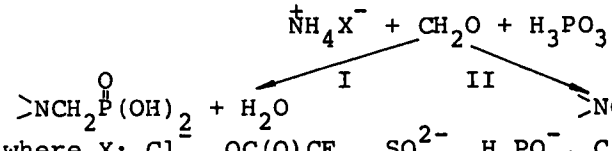
The mechanism of the stage (2) and the possible alternative processes have not been sufficiently developed. If phosphite-anion is present in the system, one might assume that hydrogen attached to phosphorus can be involved in the hydride transfer reactions:

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.



R=Et, ; R'=H, C_6H_5

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



where X: Cl^-, $OC(O)CF_3$, SO_4^{2-}, $H_2PO_3^-$, $C_2O_4^{2-}$, $\bar{O}C(O)CH_3$, ^-OTs.

It has been shown, that for ammonium salts derived from acids weaker than H_3PO_3 the red-ox(II) process is the principal one, whereas for the stronger acids the aminomethylation of H_3PO_3 (I) prevails.