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### Intramolecular Phosphoryl Transfer Reaction of N -Phospho- $\alpha$ -alanine

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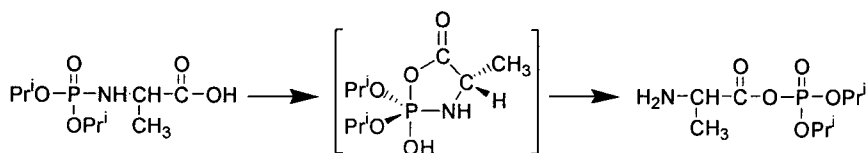
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## INTRAMOLECULAR PHOSPHORYL TRANSFER REACTION OF N-PHOSPHO- $\alpha$ -ALANINE

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N-Phospho- $\alpha$ -amino acids can self-assemble into N-phosphopeptides.<sup>1,2</sup> N-(O, O'-diisopropyl)-phosphoryl  $\alpha$ -alanine, an unknown <sup>31</sup>P NMR signal at -10.08 ppm in pyridine or -9.10 ppm in chloroform was observed. According to the product analysis, this compound must be a mixed phosphoric-carboxylic anhydride, O-(O, O'-diisopropyl)phosphoryl  $\alpha$ -alanine, which is the product of intermolecular P-N to P-O transfer. In chloroform, it reacts with diisopropyl phosphate to yield tetrapropyl pyrophosphate, while in pyridine it is more stable. For comparison, N-(O, O'-diisopropyl)phosphoryl  $\beta$ -alanine and N-(O, O'-diisopropyl)phosphoryl  $\gamma$ -amino butyric acid were synthesized. They give out no reaction at all. Theoretical studies showed that an intermediate with a five-membered ring was preferred for N-(O, O'-diisopropyl)phosphoryl  $\alpha$ -alanine.



SCHEME 1

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