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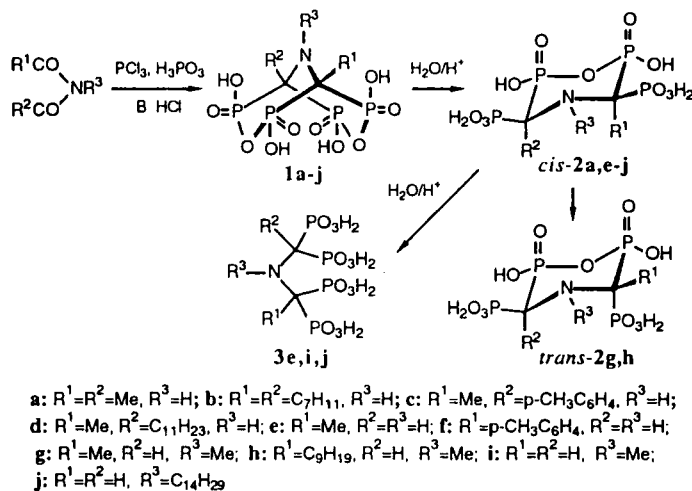
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Cyclic Oligophosphonic Anhydrides in Phosphonation of Diacylamides

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Diacylamides (10 compounds) were reacted with the system $\text{H}_3\text{PO}_3 - \text{PCl}_3$ in the media of amine hydrochlorides (conditions as in [1], $\text{B} = \text{Py}$, Bu_3N) and formed bicyclic dianhydrides **1** in high yields. The reaction failed when none of R was H and when R^1 and R^2 were a part of cycle. Less sterically hindered **1** were opened to monocyclic anhydrides **2** and to acyclic acids **3** using mild acidic hydrolysis.



As a rule, only one of the two possible diastereomers of **2** formed in the hydrolysis (probably having the *cis*-structure). In two cases *cis*-isomers (**2g,h**) were labile, and transformed into the stable *trans*-**2g,h** under the conditions of hydrolysis. The compounds **1b,c**, **2a,e,f** (most likely - *cis*-isomers), *trans*-**2g,h**, *cis*-**2h** and **3e,i,j** were isolated from the reaction mixtures as pyridine or aniline salts. In addition to ^{31}P NMR, the structures of isolated compounds were demonstrated by ^1H NMR and elemental analysis. Both **1** and **2** are stable in alkaline and neutral media. Most of **1**, **2** and **3** decompose in hot acidic aqueous solutions with elimination of a half of phosphorus in the form of H_3PO_3 .

References

- [1] I.S. Alferiev and S.Yu. Bobkov, *Z. Naturforsch.*, **47b**, 1213 (1992).