

Bulletin of the Academy of Sciences of the USSR Division of Chemical Science 1967 vol.16 N10, pages 2185-2192

Structure and properties of the products of the reactions of trialkylphosphites and dialkylphosphorous acids with ethylideneacetylacetone and ethylideneacetoacetic ester

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Abstract

1. Trialkylphosphites react with ethylideneacetylacetone and ethylideneacetoacetic ester under mild conditions (20-40°, dry nitrogen atmosphere) to form 2,2,2-trialkoxy-3,5-dimethyl-4-acetyl-1-oxa-2-phosphacyclopent-4-enes and 2,2,2-trialkoxy-3,5-dimethyl-4-carboethoxy-1-oxa-2-phosphacyclopent-4-enes, respectively. 2. The reaction of the phosphoranes with alcohol, acetic anhydride, and water results in cleavage of the phosphorane ring at the P-O bond. 3. Hydrolysis of the phosphoranes yields esters of 1-methyl-2,2-diacetyl- and 1-methyl-2-acetyl-2-carboethoxyethylphosphonic acids. The keto-enol tautomerism of these compounds was studied by ultra-violet spectroscopy. 4. Distillation of the phosphorane hydrolysis products resulted in the splitting out of alcohol and the formation of 2-oxo-2-alkoxy-3,5-dimethyl-4-acetyl-1-oxa-2-phosphacyclopent-4-enes and 2-oxo-2-alkoxy-3,5-dimethyl-4-carboethoxy-1-oxa-2-phosphacyclopent-4-enes, respectively. These same esters were also obtained from the reaction of ethylideneacetylacetone and ethylideneacetoacetic ester with dialkylphosphorous acids. 5. The structures of all compounds synthesized were confirmed by infrared spectra. © 1968 Consultants Bureau.

<http://dx.doi.org/10.1007/BF00913303>
