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Features of Reaction of 2-(5-Methyl-2-phenyl-2*H*-1,2,3-diazaphosphol-4-yl)-4*H*-benzo[*e*]-1,3,2-dioxaphosphorin-4-one with 1,2-Dicarbonyl Compounds[1]

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Abstract—2-(5-Methyl-2-phenyl-2*H*-1,2,3-diazaphosphol-4-yl)-4*H*-benzo[*e*]-1,3,2-dioxaphosphorin-4-one reacts with perfluorodiacetyl, 3,6-di(*tert*-butyl)-1,2-benzoquinone and phenanthrenequinone only with the participation of a three-coordinated phosphorus atom to form spirophosphoranes containing acyclic 5-methyl-2-phenyl-2*H*-1,2,3-diazaphosphol-4-yl substituent, whereas the interaction with tetrachloro-1,2-benzoquinone proceeds via expanding the six-membered heterocycle to the nine-membered one to form 2-(2-phenyl-2*H*-1,2,3-diazaphosphol-4-yl)-2,9-dioxo-4,5,6,7-tetrachlorodibenzo[*d*,*h*]-1,3,8-trioxaphosphonine.

Keywords: diazaphosphol, tetrachloro-1,2-benzoquinone, phenanthrenequinone, perfluorodiacetyl, phosphorane

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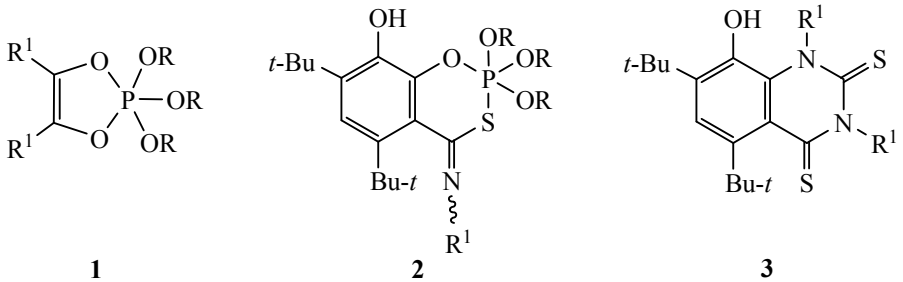
The reaction of 1,2-dicarbonyl compounds with phosphorus(III) derivatives [1–4] is a convenient method for synthesizing derivatives of pentacoordinated phosphorus, important intermediates of phosphorylation and dephosphorylation processes occurring in living cells [5]. On the basis of this reaction, a variety of phospholenes **1** with a pentacoordinated phosphorus atom has been obtained (Scheme 1), the features of their molecular structure have been studied, and the main directions of their chemical transformations into the more stable derivatives of tetracoordinated phosphorus have been determined [6–8].

Among the unusual chemical properties of phospholenes **1** the oxaphosphorane condensation should be mentioned [9, 10]. Recently, it has been shown [11] that the P-pentacoordinated products of the [4+1]-cycloaddition of 3,5-di(*tert*-butyl)-1,2-benzoquinone with

Scheme 1.



1 **2** **3**

R, R^1 = Alk.

[1] Supporting materials are available from authors.