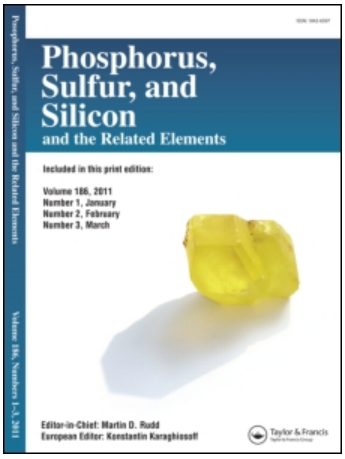

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Reactions of Sulfur with Some Unusual Organophosphorus Compounds in Low Coordination States

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REACTIONS OF SULFUR WITH SOME UNUSUAL ORGANO-PHOSPHORUS COMPOUNDS IN LOW COORDINATION STATES

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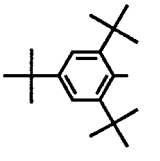
Abstract Reactions of sulfur with some unusual organophosphorus compounds in low coordination states such as diphosphenes, phosphaallenes, and diphosphaallenes were carried out.

INTRODUCTION

We have been successful in isolation and characterization of several organophosphorus compounds in low coordination states by utilizing the 2,4,6-tri-t-butylphenyl moiety (here abbreviated to the Ar group) as a protective group.[1] Such unusual organophosphorus compounds as diphosphene (**1**),[2] 1-phosphaallene (**2**),[3] and 1,3-diphosphaallene (**3**)[4] having low coordinated phosphorus atom(s) of coordination number 2 were isolated and characterized as sterically protected stable compounds.

ArP=PAr (**1**) ArP=C=CPh$_2$ (**2**) ArP=C=PAr (**3**)

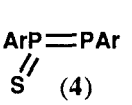
Ar = 

We report here the reactions of sulfur with such unusual organophosphorus compounds.

REACTIONS OF SULFUR WITH DIPHOSPHENES, PHOSPHA-ALLENES, AND DIPHOSPHAALLENES

The reaction of sulfur with **1** in triethylamine resulted in the formation of a phosphorus and sulfur analog of azoxy compound **4**,[5]

which was further converted to thiadiphosphirane **5** as a very stable small-ring compound.[6]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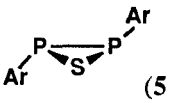
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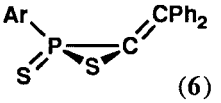
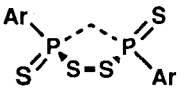

(6)

The reaction of sulfur with **2** gave methylenethiaphosphirane sulfide **6**,[7] the structure of which was determined by the X-ray analysis.

The reaction of sulfur with **3** in the presence of DBU gave several new heterocyclic compounds containing phosphorus and sulfur or oxygen, **7**,[8] **8**,[9] and **9**.[10] The structures of these reaction products have been analyzed by the X-ray crystallography.


(7)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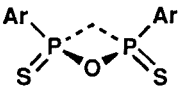
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