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## Phosphorus, Sulfur, and Silicon and the Related Elements

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### Complex Formation of $[\text{Ph}_2\text{P}(\text{O})\text{I}_2\text{C}=\text{CH}_2]$ and $[\text{Ph}_2\text{P}(\text{O})\text{I}_2\text{C}=\text{PPh}_3]$ with Phosphorus and Tantalum Pentafluorides

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COMPLEX FORMATION OF  $[\text{Ph}_2\text{P}(\text{O})]_2\text{C}=\text{CH}_2$  AND  
 $[\text{Ph}_2\text{P}(\text{O})]_2\text{C}=\text{PPh}_3$  WITH PHOSPHORUS AND TANTALUM  
PENTAFLUORIDES

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Reactions of  $\text{PF}_5$  and  $\text{TaF}_5$  with  $[\text{Ph}_2\text{P}(\text{O})]_2\text{C}=\text{CH}_2$  (I) and  
 $[\text{Ph}_2\text{P}(\text{O})]_2\text{C}=\text{PPh}_3$  (II) in MeCN and  $\text{CH}_2\text{Cl}_2$  were studied by  
means of  $^{19}\text{F}$ ,  $^{31}\text{P}$ ,  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectroscopy. It has  
become evident, that one or two phosphoryl groups in (I)  
and (II), as well as in cis- and trans- $\text{Ph}_2\text{P}(\text{O})\text{CH}=\text{CHP}(\text{O})\text{Ph}_2$ ,  
are involved in complex formation. The formation of tetra-  
fluoro cations  $\text{PF}_4\text{L}$  and  $\text{TaF}_4\text{L}$  along with pentafluorocom-  
plexes  $\text{PF}_5\text{L}$  and  $\text{TaF}_5\text{L}$  was found. Ligands are coordinated  
with central ions of complexes as chelates. The trans-atoms  
 $\text{F}_1$  of  $\text{TaF}_5\text{L}$  are nonequivalent because of nonsymmetric posi-  
tion to the  $\text{Ph}_3\text{P}$ -group. The  $\text{F}_1$ -atoms in  $\text{PF}_4\text{L}$  are supposed  
to be symmetric to the  $\text{Ph}_3\text{P}$ -group. The formation of tri-  
fluorocomplexes  $\text{TaOF}_3\text{L}$  was also observed. Since the posi-  
tion of  $^{19}\text{F}$  NMR resonance lines of  $\text{TaOF}_3\text{L}$  is near to that  
of pentafluorocomplexes, it can be supposed that either the  
change of Ta coordination number takes place, either oxygen  
atom comes into complex with inner sphere in the reaction  
with ligand or during hydrolysis.