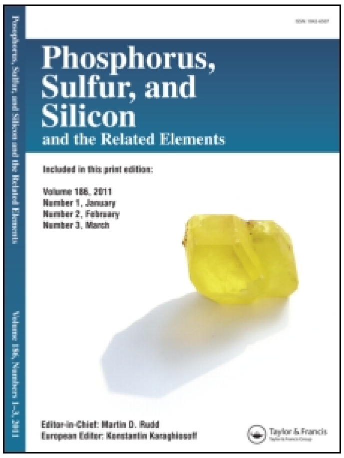

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Perfluoroalkyl Diphosphenes - Synthons for Diphospha Heterocycles

Joseph Grobe[a]; Due Le Van[a]; Joachim Schulze[a]
[a] Anorganisch-Chemisches Institut der Universität Münster, Münster, FRG

To cite this Article Grobe, Joseph , Van, Due Le and Schulze, Joachim(1987) 'Perfluoroalkyl Diphosphenes - Synthons for Diphospha Heterocycles', Phosphorus, Sulfur, and Silicon and the Related Elements, 30: 3, 773
To link to this Article: DOI: 10.1080/03086648708079265
URL: http://dx.doi.org/10.1080/03086648708079265

Perfluoroalkyl Diphosphenes - Synthons for Diphospha Heterocycles

Joseph Grobe*, Duc Le Van and Joachim Schulze
Anorganisch-Chemisches Institut der Universität Münster
Corrensstraße 36, D-4400 Münster, FRG.

Recent successful work in the field of (2p-3p)π (P=C) and (2p-4p)π (As=C) systems with F or R_F substituents led us to search for unsaturated (3p-3p)π compounds using the stabilizing effect of perfluoroalkyl groups.

The result of our attempts is a simple one-pot procedure, in which, according to eq. (1), diphosphenes $R_FP=PR_F$ are formed from R_FPI_2 and $SnCl_2$ as reactive intermediates which can be trapped by 1,3-dienes in Diels-Alder type reactions (eq. 2).

$$2\ R_FPI_2 + 2\ SnCl_2 \longrightarrow R_FP{=}PR_F + 2\ SnCl_2I_2 \qquad (1)$$

$$R_FP{=}PR_F + \text{1,3-diene} \longrightarrow \text{(2+4) cycloadduct} \qquad (2)$$

The cycloadducts obtained are generated in a stereospecific reaction; ^{31}P and ^{19}F NMR spectra establish the exclusive formation of the isomers with trans positions of the R_F groups. The observed stereoselectivity suggests a concerted mechanism for the (2+4) cycloaddition. The Diels-Alder compounds can be used as source for the diphosphenes as demonstrated by the retrodiene cleavage of the adduct of 1,3-cyclohexadiene and $F_3CP=PCF_3$ in the presence of 2,3-dimethylbutadiene.

Facts and arguments in support of the diphosphene intermediates will be presented and discussed on the poster. In addition, recent results with modified $SnCl_2$ reagents and substitutes for the production of phosphinidenes and diphosphenes will be produced.