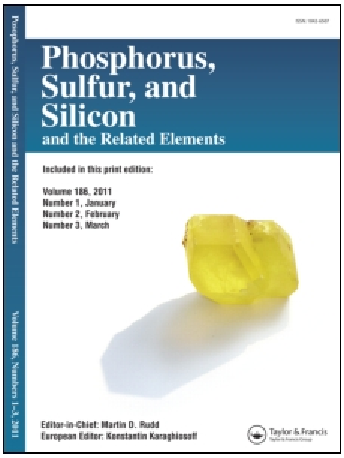

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Solution Structure and Reactions of Lithium-Organophosphido Complexes

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To cite this Article Hasselkuβ, G. and Stelzer, O.(1987) 'Solution Structure and Reactions of Lithium-Organophosphido Complexes', Phosphorus, Sulfur, and Silicon and the Related Elements, 30: 3, 731

To link to this Article: DOI: 10.1080/03086648708079225

URL: http://dx.doi.org/10.1080/03086648708079225

Solution Structure and Reactions of Lithium-Organophosphido Complexes

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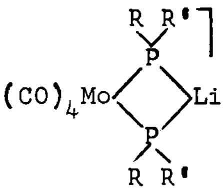
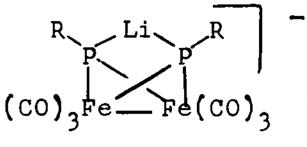
Transition metal carbonyl complexes of phosphine (PH_3), primary and secondary phosphines may be deprotonated with methyllithium to give the lithiated derivatives (I, II) which were shown to be useful intermediates in template synthesis of unusual phosphorus ligands [1].



Li^+ (I)

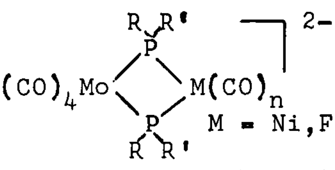


Li^+ (II)

R = Ph, Me, tBu

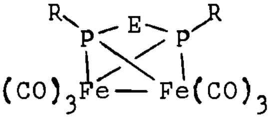
R, R' = H, Me, Ph, tBu, iPr, $-CH_2CH_2-$

Using ^1H-, ^7Li-, ^{13}C- and ^{31}P-nmr spectroscopy these complexes could be assigned to an ionic four-membered mono- or bicyclic MP_2Li- or M_2P_2Li-structure (I or II). Intermolecular Li-exchange at ambient temperature and configurational isomerisation at the P-atoms are responsible for the temperature dependence of their ^7Li- and ^{31}P-nmr spectra.



(III)

M = Ni,Fe,Mo, n = 2,3,4.



(IV)

E = e.g. PR

On reaction with various electrophiles the bridging Li^+ in I or II may be replaced leading to bimetallic or chelate complexes (e.g. III or IV). Exchange reactions of Li^+ in the complexes I and II by other metal cations, e.g. Mg^{2+}, Al^{3+} will be reported.

[1] O. Stelzer, E. Unger and V. Wray, Chem. Ber. 110, 3430 (1977); O. Stelzer and N. Weferling, Z. Naturforsch. 35b, 74 (1980).