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Solution Structure and Reactions of Lithium-Organophosphido Complexes

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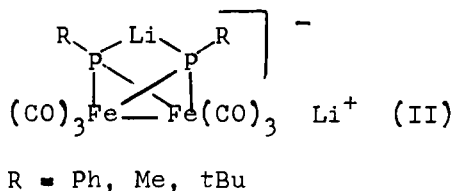
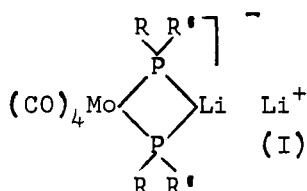
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Solution Structure and Reactions of Lithium-Organophosphido Complexes

G. Hasselkuß and O. Stelzer*

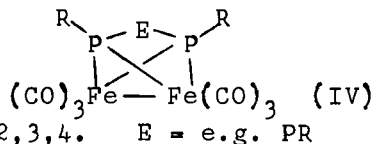
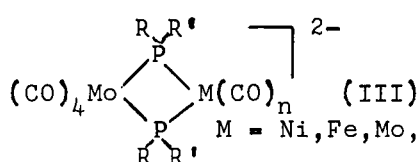
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Transition metal carbonyl complexes of phosphine (PH_3), primary and secondary phosphines may be deprotonated with methyllithium to give the lithiated derivatives (I, II) which were shown to be useful intermediates in template synthesis of unusual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



$\text{R, R}' = \text{H, Me, Ph, tBu, iPr, -CH}_2\text{CH}_2\text{-}$

Using ^1H -, ^7Li -, ^{13}C - and ^{31}P -nmr spectroscopy these complexes could be assigned to an ionic four-membered mono- or bicyclic $\text{MP}_2\text{Li-}$ or $\text{M}_2\text{P}_2\text{Li-}$ 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.



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

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