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# Supporting Information

# 2-Aminophenolate Ligands for Phosphorus(V): A Lithium Salt Featuring the Chiral $[P(OC_6H_4NR)_3]^-$ Anion

Chuantian Zhan, Zeyu Han, Brian O. Patrick and Derek P. Gates*

*Department of Chemistry, University of British Columbia, 2036 Main Mall, Vancouver, British Columbia, Canada, V6T 1Z1. E-mail: dgates@chem.ubc.ca*

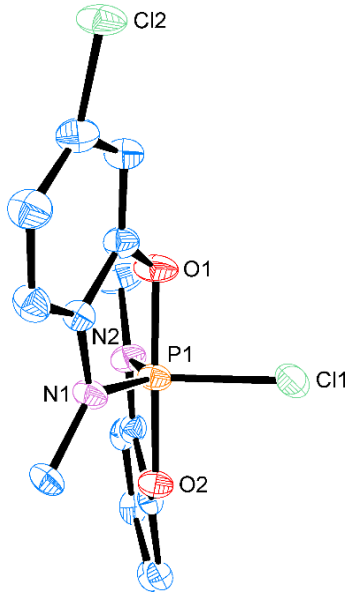


**Fig. S1** The minor component (7 %) in the molecular structure for intermediate **3a** (thermal ellipsoids are displayed at 50% probability level). Hydrogen atoms are omitted for clarity. Bond lengths and angles are similar to those found in the major structure.

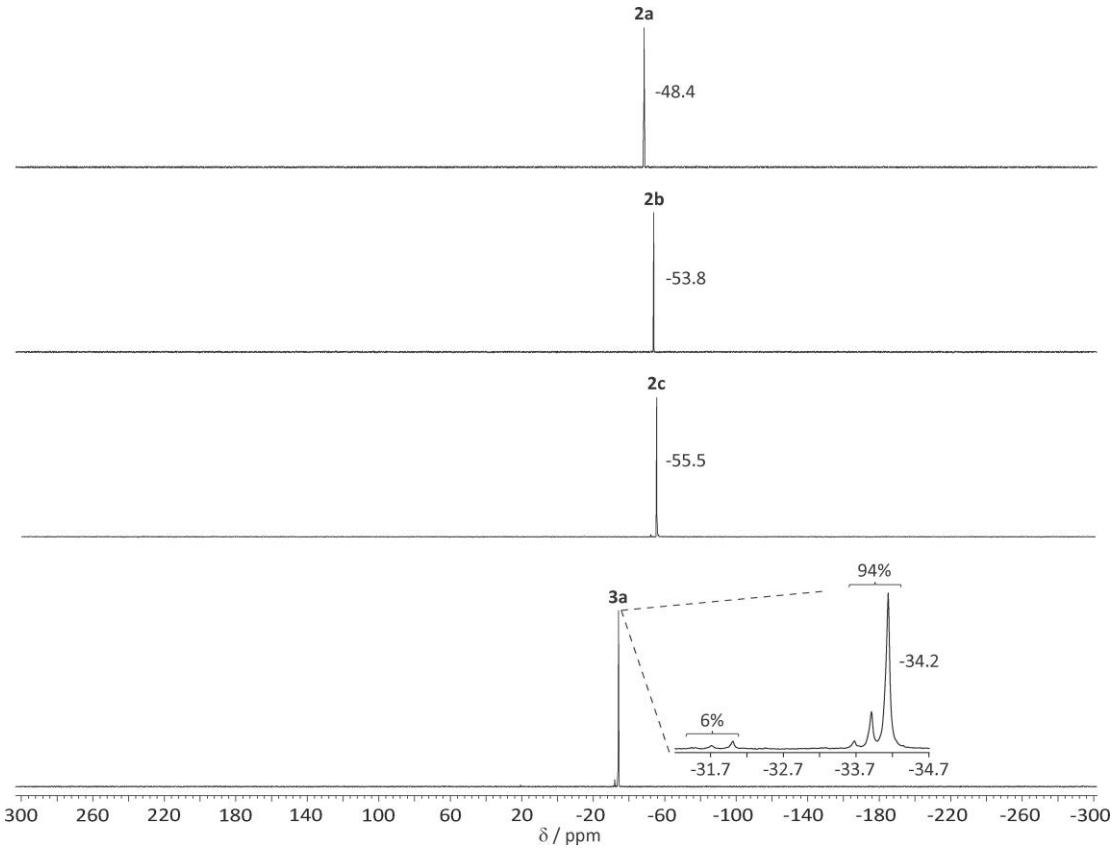


**Fig. S2** $^{31}P\{^{1}H\}$ NMR spectra (121 MHz, $CDCl_3$, 298 K) of phosphoranes **2a–c** and intermediate **3a**.

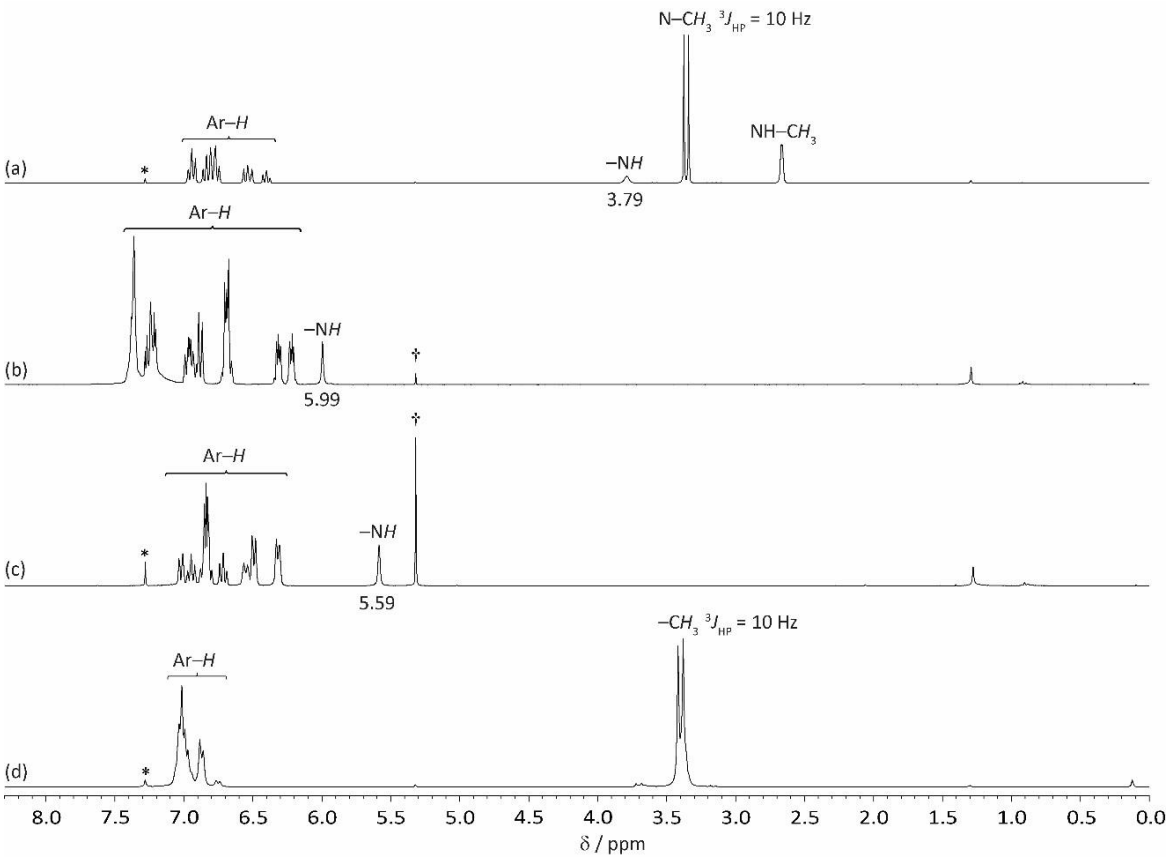


**Fig. S3** $^{1}H$ NMR spectra (300 MHz, $CDCl_3$, 298 K) of phosphoranes: (a) **2a**; (b) **2b**; (c) **2c**; (d) **3a** recrystallized from $CH_2Cl_2$ (* indicates the residual $CHCl_3$ and † indicates the residual $CH_2Cl_2$ solvent).

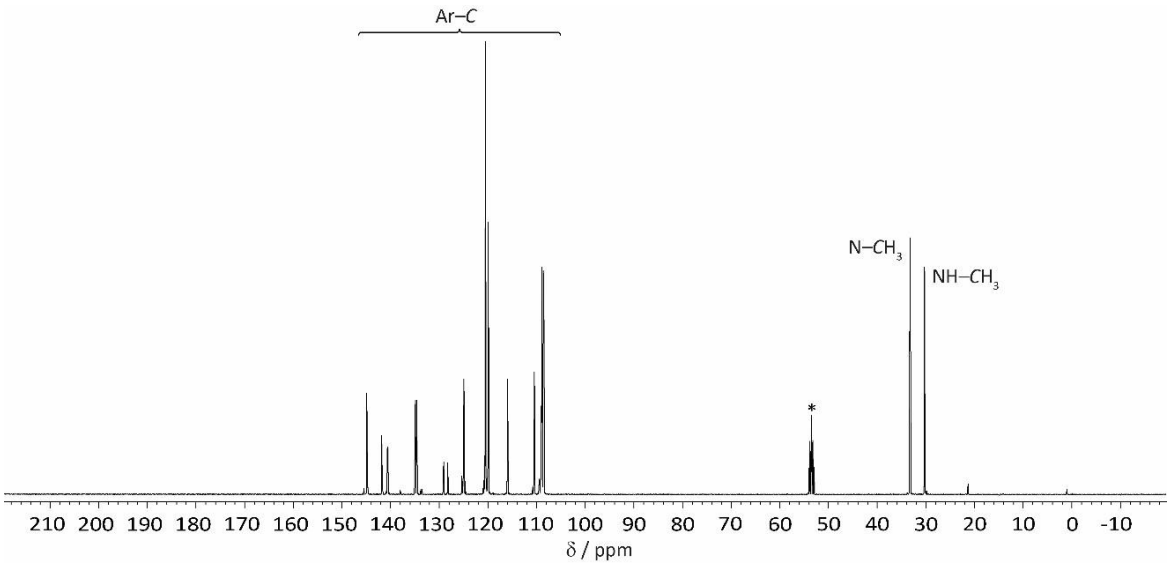


**Fig. S4** $^{13}C\{^{1}H\}$ NMR spectrum (100.5 MHz, $CD_2Cl_2$, 298 K) of phosphorane **2a** (* indicates the solvent).

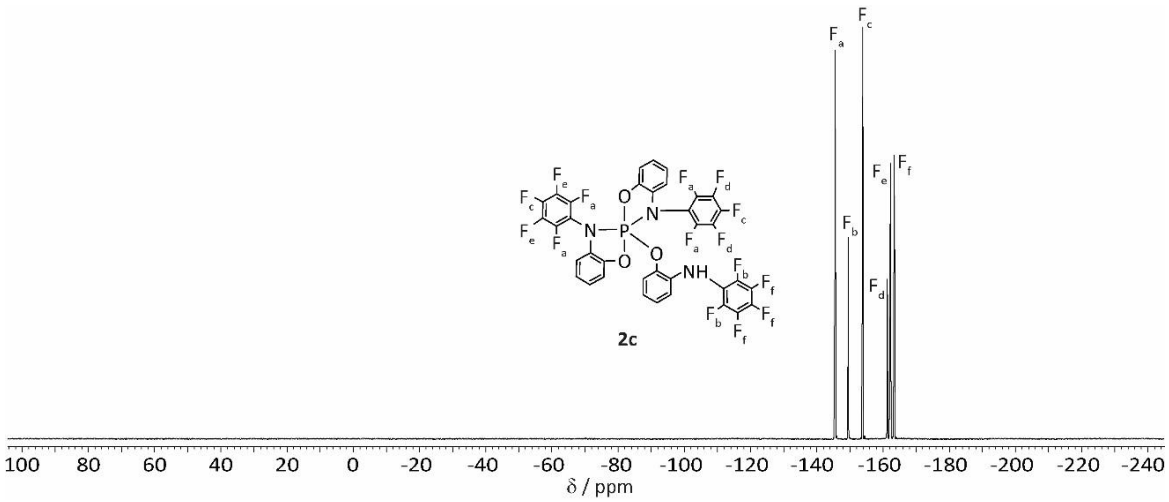


**Fig. S5** $^{19}F\{^{1}H\}$ NMR spectrum (282 MHz, $CDCl_3$, 298 K) of phosphorane **2c**.

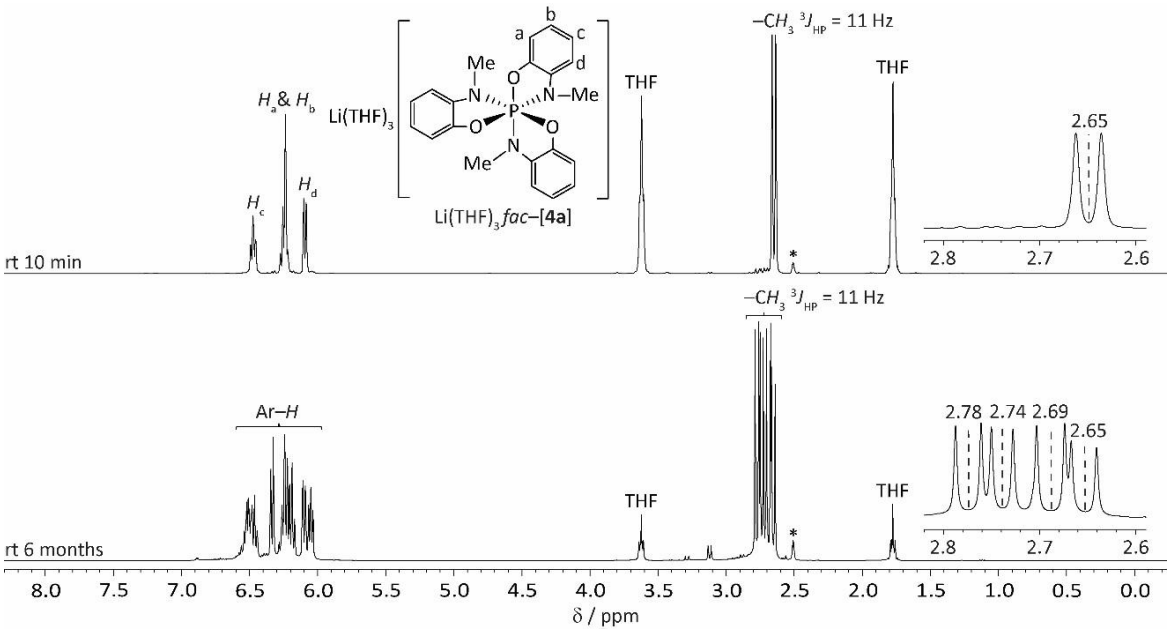


**Fig. S6** $^{1}H$ NMR spectra (400 MHz, DMSO-$d_6$, 298 K) of $Li(THF)_3$ *fac*-[**4a**] (* indicates the solvent).

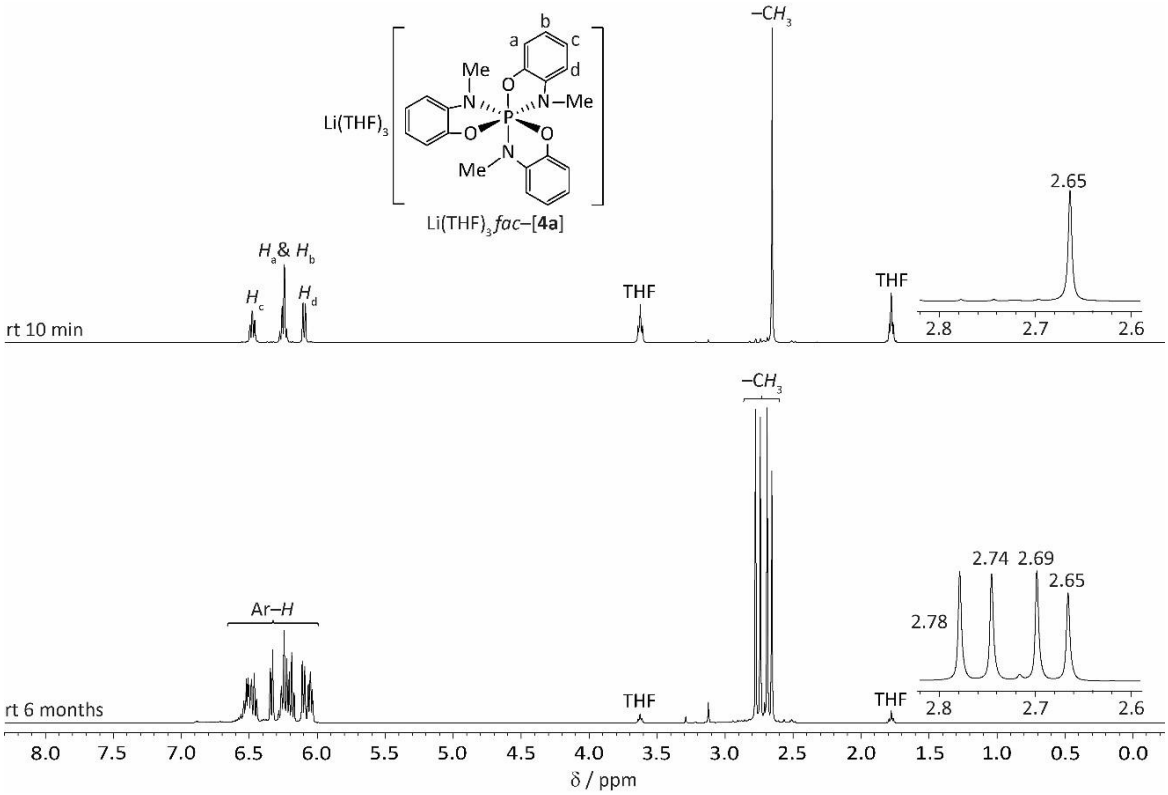


**Fig. S7** $^{1}H\{^{31}P\}$ NMR spectra (400 MHz, DMSO-$d_6$, 298 K) of $Li(THF)_3$ *fac*-[**4a**].

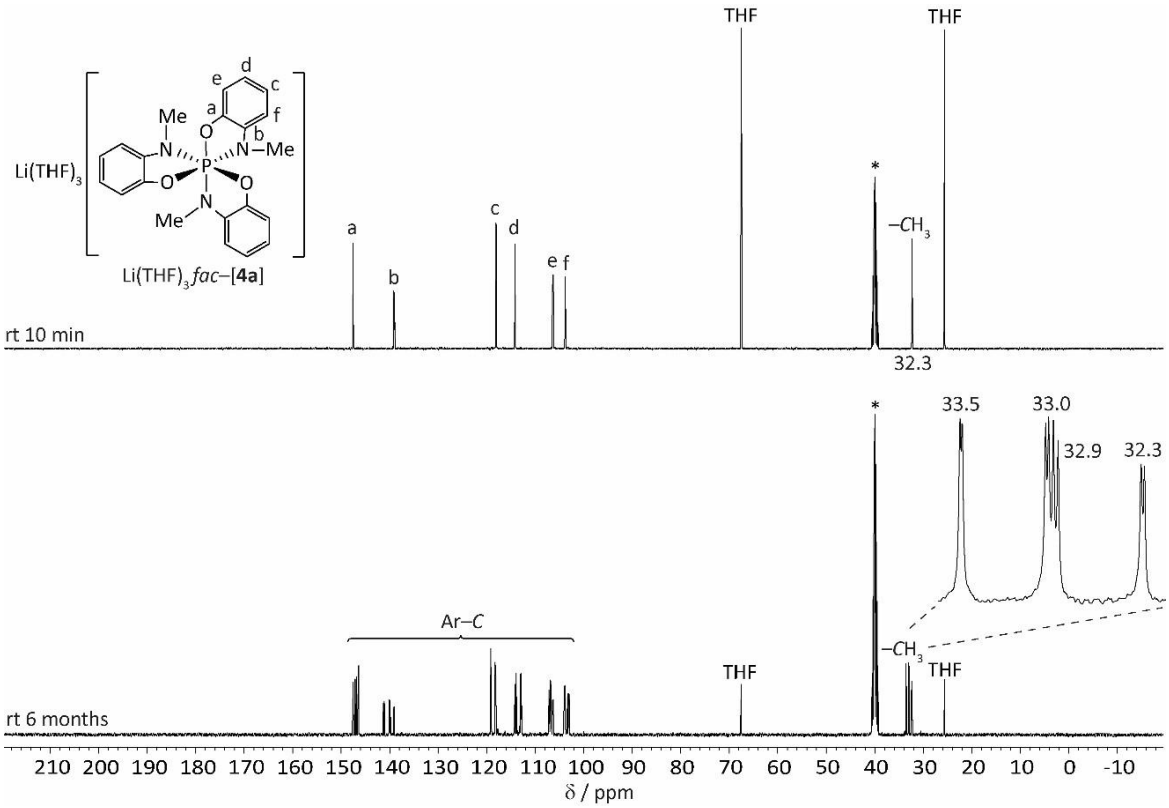


**Fig. S8** $^{13}C\{^{1}H\}$ NMR spectra (100.5 MHz, DMSO-$d_6$, 298 K) of Li(THF)$_3$ *fac*-[**4a**] (* indicates the solvent).

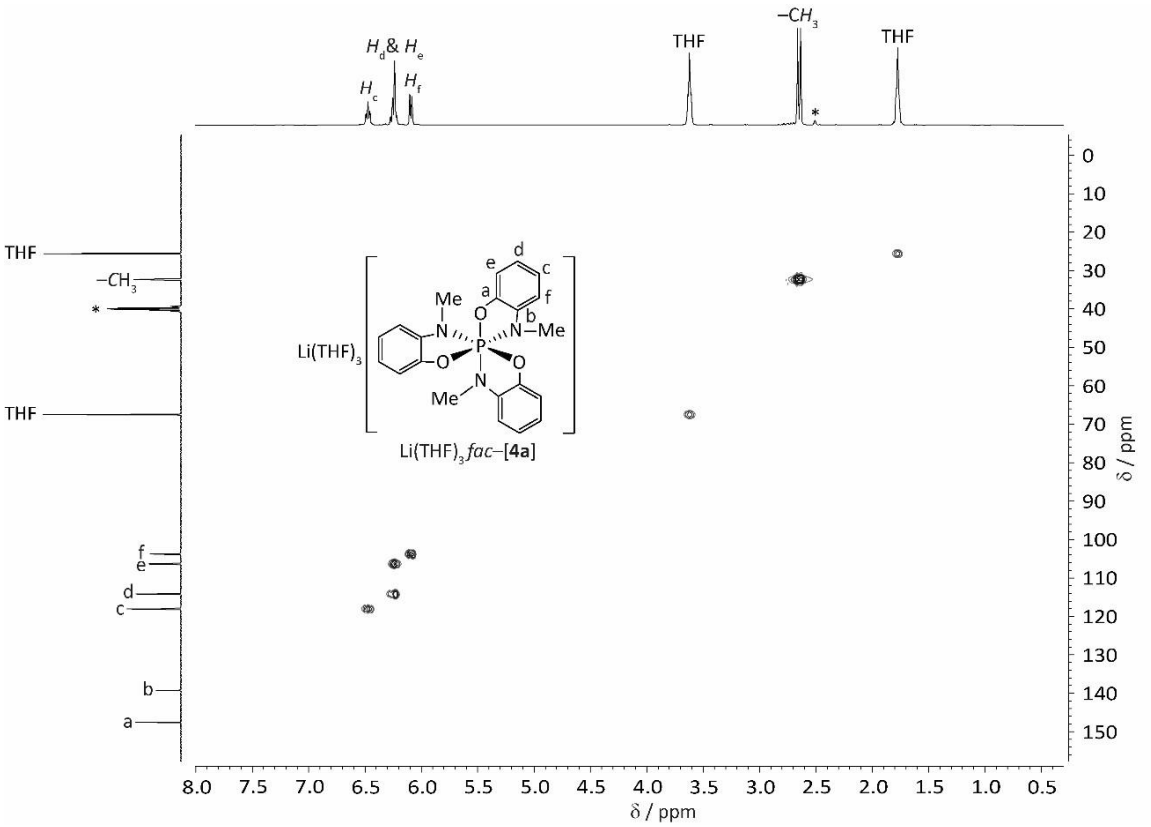


**Fig. S9** $^{1}$H-$^{13}$C HSQC NMR spectrum (400 MHz for $^{1}$H, DMSO-$d_6$, 298 K) of Li(THF)$_3$*fac*-[**4a**] (The ordinate axis shows the $^{13}$C{$^{1}$H} NMR spectrum and the abscissa axis shows the $^{1}$H NMR spectrum; * indicates the solvent).

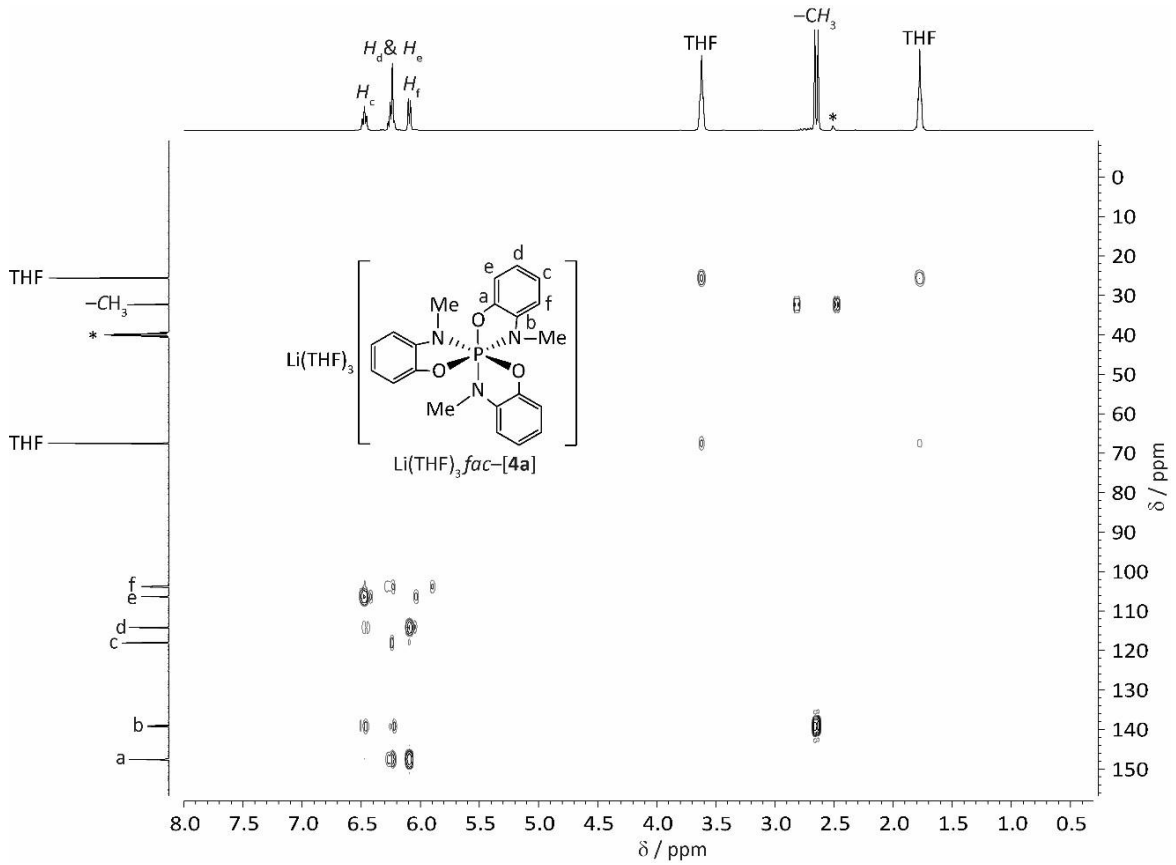


**Fig. S10** $^{1}$H-$^{13}$C HMBC NMR spectrum (400 MHz for $^{1}$H, DMSO-$d_6$, 298 K) of Li(THF)$_3$ *fac*-[**4a**] (The ordinate axis shows the $^{13}$C{$^{1}$H} NMR spectrum and the abscissa axis shows the $^{1}$H NMR spectrum; * indicates the solvent).

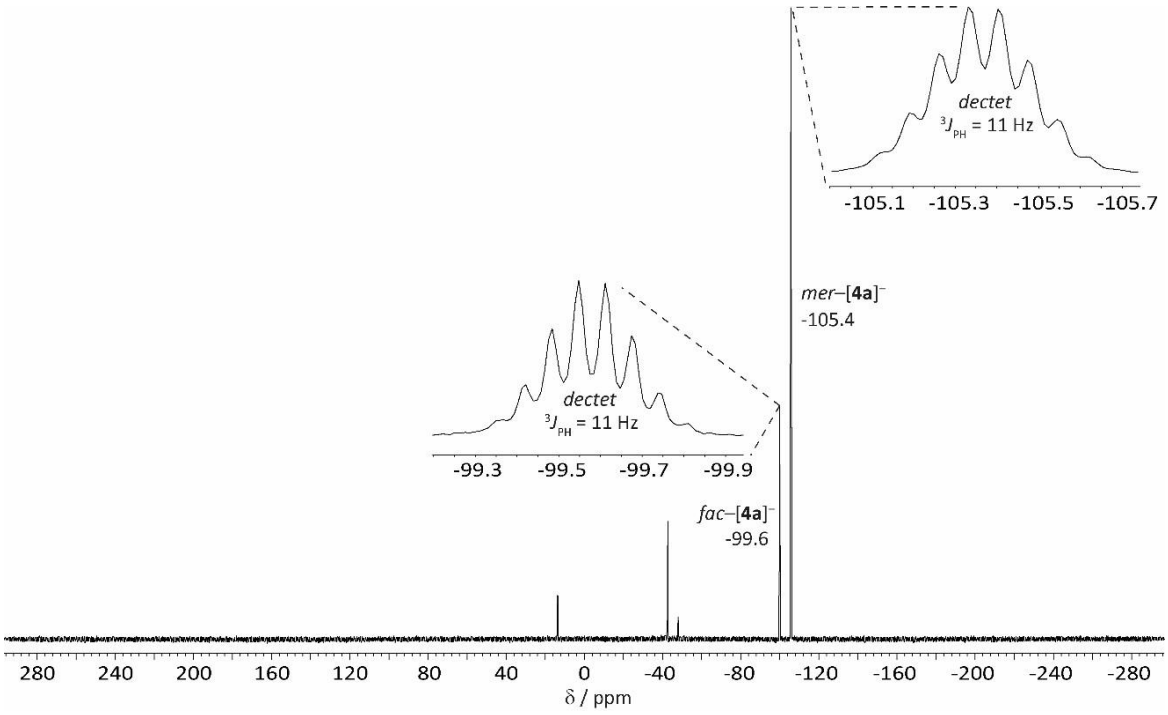


**Fig. S11** $^{31}$P NMR spectrum (121 MHz, 298 K) of Li(THF)$_3$ *fac*-[**4a**] in DMSO-$d_6$ over 6 months.

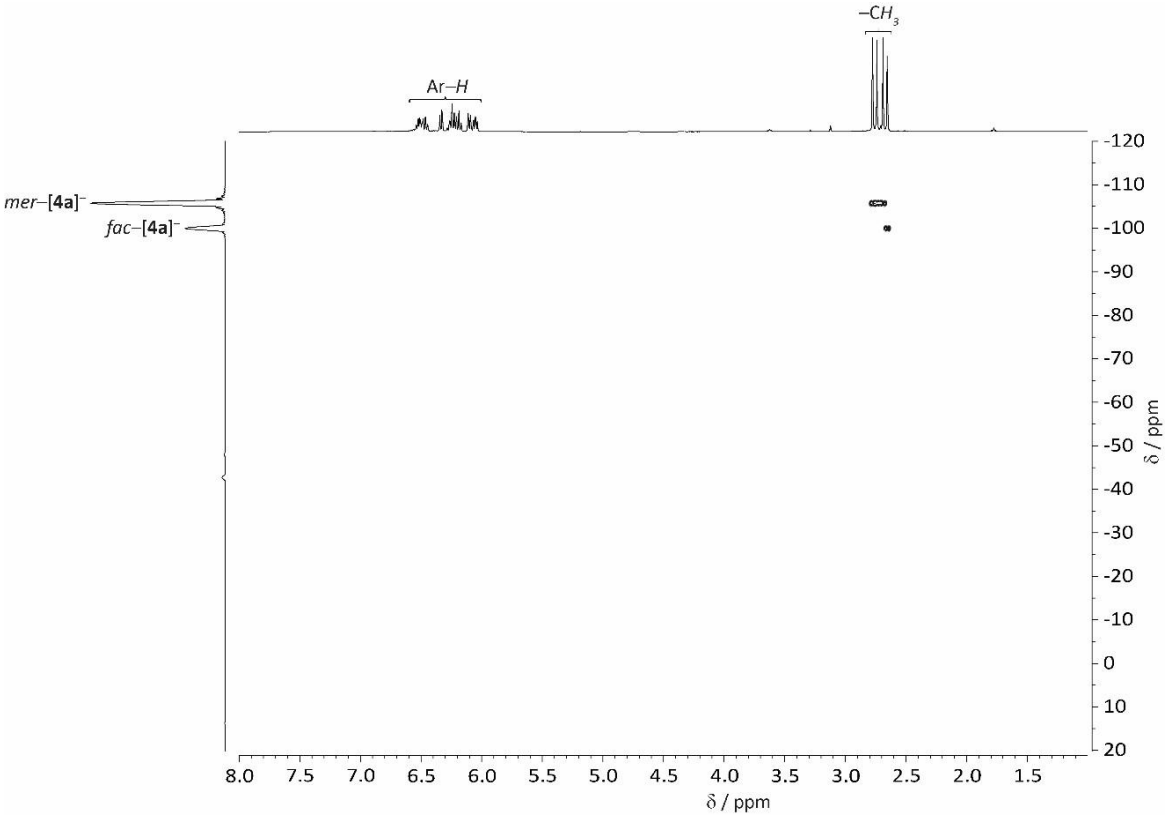


**Fig. S12** $^1$H-$^{31}$P HMBC NMR spectrum (400 MHz for $^1$H, DMSO-$d_6$, 298 K) of Li(THF)$_3$ *fac*-[**4a**] (The ordinate axis shows the $^{31}$P{$^1$H} NMR spectrum and the abscissa axis shows the $^1$H NMR spectrum).

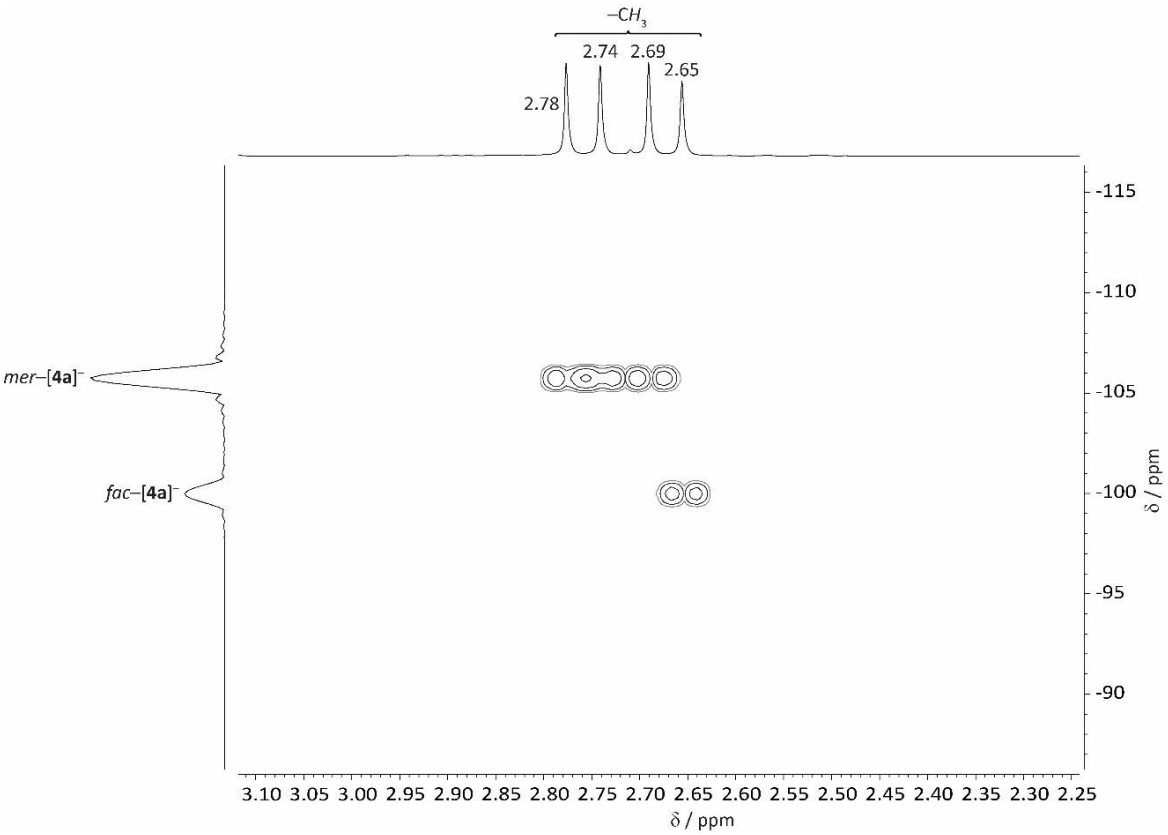


**Fig. S13** Partial $^{1}H$-$^{31}P$ HMBC NMR spectrum (400 MHz for $^{1}H$, DMSO-$d_6$, 298 K) of Li(THF)$_3$ *fac*-[**4a**] (The ordinate axis shows the $^{31}P\{^{1}H\}$ NMR spectrum and the abscissa axis shows the $^{1}H$ NMR spectrum).

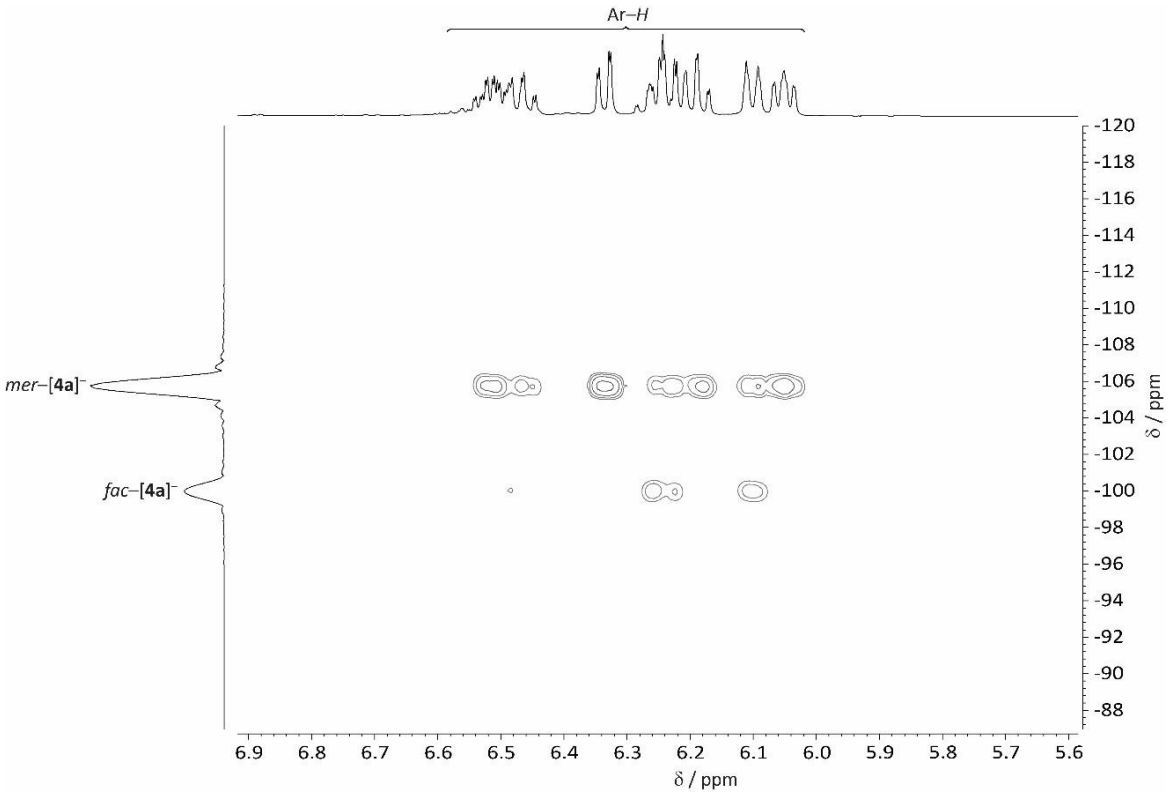


**Fig. S14** Partial $^{1}H$-$^{31}P$ HMBC NMR spectrum (400 MHz for $^{1}H$, DMSO-$d_6$, 298 K) of $Li(THF)_3$ *fac*-[**4a**] (The ordinate axis shows the $^{31}P\{^{1}H\}$ NMR spectrum and the abscissa axis shows the $^{1}H$ NMR spectrum).