A geometrically constrained tricyclic phosphine – coordination, ring expansion by insertion of CO into a P-C bond and Lewis-acid initiated formation of an oligocyclic molecule with a P$_2$C$_{22}$ backbone

Alexander Brand, Philipp Wegener, Alexander Hepp, and Werner Uhl*

Institut für Anorganische und Analytische Chemie der Universität Münster, Corrensstraße 30, D-48149 Münster, Germany

NMR spectra
NMR Spectra of Compound 4

Figure S1: $^1$H NMR spectrum of 4 in C$_6$D$_6$ with THF signals

Figure S2: $^{13}$C($^1$H) NMR spectrum of 4 in C$_6$D$_6$
Figure S3: $^{31}$P($^1$H) NMR spectrum of 4 in C$_6$D$_6$
NMR Spectra of Compound 5

Figure S4: $^1$H NMR spectrum of 5 in C$_6$D$_6$

Figure S5: $^{13}$C[$^1$H] NMR spectrum of 5 in C$_6$D$_6$ **Signal at $\delta = 201.0$ ppm: Mo(CO)$_6$
Figure S6: $^{31}\text{P}^\{1\text{H}\}$ NMR spectrum of 5 in C$_6$D$_6$
NMR Spectra of Compound 6

Figure S7: $^1$H NMR spectrum of 6 in C$_6$D$_6$

Figure S8: $^{13}$C($^1$H) NMR spectrum of 6 in C$_6$D$_6$ Signal at $\delta = 191.1$ ppm: W(CO)$_6$
Figure S9: $^{31}$P($^1$H) NMR spectrum of 6 in C$_6$D$_6$
NMR Spectra of Compound 7

Figure S10: $^1$H NMR spectrum of 7 in C$_6$D$_6$

Figure S11: $^{13}$C($^1$H) NMR spectrum of 7 in C$_6$D$_6$
Figure S12: $^{31}\text{P}[^1\text{H}]$ NMR spectrum of 7 in C$_6$D$_6$
NMR Spectra of Compound 8

Figure S13: $^1$H NMR spectrum of 8 in C$_6$D$_6$

Figure S14: $^{13}$C{$^1$H} NMR spectrum of 8 in C$_6$D$_6$
Figure S15: $^{31}$P{¹H} NMR spectrum of 8 in C₆D₆
NMR Spectra of Compound 8

Figure S16: $^1$H NMR spectrum of 9 in CD$_2$Cl$_2$

Figure S17: $^{13}$C($^1$H) NMR spectrum of 9 in CD$_2$Cl$_2$
Figure S18: $^{31}\text{P}^\text{1H}$ NMR spectrum of 9 in CD$_2$Cl$_2$