# Synthesis and Reactivity of a Nickel-Carbonyl Complex Bearing *N*-Phosphine-Oxide-Substituted Imidazolinylidenes

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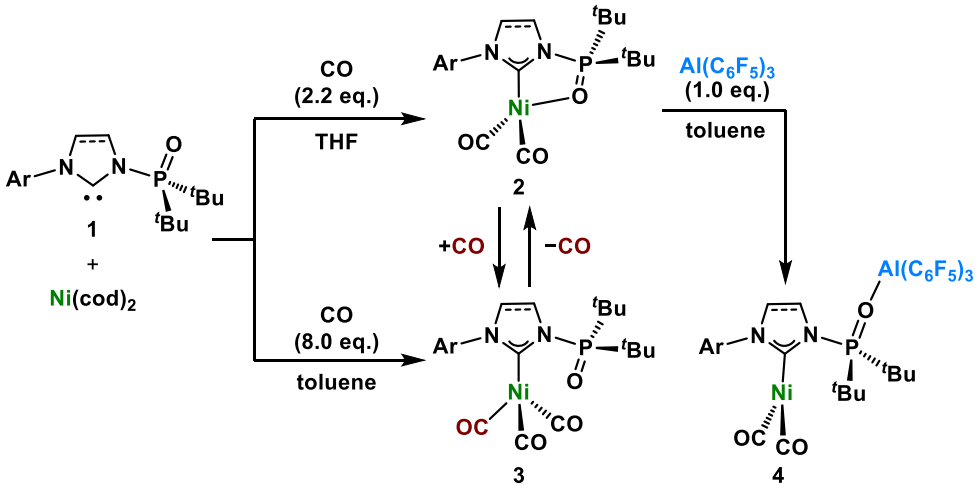
A variety of Ni(0) carbonyl complexes bearing *N*-heterocyclic carbenes (NHCs), namely (NHC)Ni(CO)$_n$ ($n$ = 2 or 3), have been synthesized for the comparison of the steric and electronic properties of NHCs.[1] However, there have been no reports on NHCs that can afford both di- and tri-carbonyl complexes. Herein, we report a selective synthesis of both nickel di- and tri-carbonyl complexes bearing *N*-phosphine-oxide-substituted imidazolinylidenes[2] as well as their interconversion under the ambient conditions.[3]

Treatment of a solution of **1** and Ni(cod)$_2$ with CO afforded either ($\kappa$-*C*,*O*-**1**)Ni(CO)$_2$ (**2**) or ($\kappa$-*C*-**1**)Ni(CO)$_3$ (**3**) quantitatively depending on the reaction conditions. Stirring **2** under the CO atmosphere resulted in the formation of **3** in excellent yields. In addition, complex **3** was again converted to **2** under the reduced pressure.

Reaction of **2** with Al(C$_6$F$_5$)$_3$ yielded heterobimetallic Ni/Al complexes (**4**), in which the carbene moiety coordinates to the nickel as well as the oxygen atom coordinates to the aluminum.




**Scheme 1.** Synthesis and reactivity of ($\kappa$-*C*,*O*-**1**)Ni(CO)$_2$ (**2**) or ($\kappa$-*C*-**1**)Ni(CO)$_3$ (**3**).

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