Synthesis, structure, and polymerization activity of cyclopentadienylnickel(II) N-heterocyclic carbene complexes: selective cross-metathesis in metal coordination spheres.

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The N-heterocyclic carbene (NHC) complexes [(RC_5H_4)Ni(X)(NHC)] (**2**–**5**) have been prepared by treating nickelocene [or 1,1′-bis(alkenyl)nickelocene] with a suitable carbene precursor. The alkenylcyclopentadienido complexes **4** and **5** undergo chemoselective cross-metathesis with methyl acrylate or methyl vinyl ketone in the presence of the seocnd-generation Grubbs catalyst to yield complexes **6**–**8**, which bear an α,β-unsaturated carbonyl substituent on the cyclopentadienido ligand. The X-ray crystal structure of **2** [monoclinic,$P2_1/n$, Ni–$C_{carbene}$ 1.879(3) Å] and **7** [triclinic, P, Ni–$C_{carbene}$ 1.8874(6) Å] reveal undistorted trigonal-planar Ni coordination. VT-NMR studies of complexes **2** and **3**, which possess an *N*-alkyl substituent, show hindered rotation of the carbene ligand. Complexes [(RC_5H_4)Ni(X)(NHC)], in the presence of an excess of MAO, display high activity in the polymerization of styrene and moderate activity in the oligomerization of phenylacetylene.

Adres publiczny

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