Triple C–H bond activation of a nickel-bound methyl group: synthesis and X-Ray structure of a carbide cluster $(NiCp)_6(\mu_6\text{-}C)$.

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Streszczenie

A new hexanuclear cyclopentadienylnickel carbide cluster (NiCp)(6)(μ(6)-C) (1) was obtained through the thermolysis of the alkene complex [NiCp(CH(3))(η(2)-CH(2)═CHC(4)H(9))] (4). The X-ray molecular structure of 1 (monoclinic; P2(1)/c; Ni-C(carbide) = 1.767(4)-2.109(4) Å) reveals a highly deformed octahedral arrangement of nickel atoms with two octahedron edges opened (Ni-Ni bonding distances = 2.410(1)-2.623(1) Å, Ni···Ni nonbonding distances = 3.107(2) and 3.108(2) Å). Cluster 1 is the first example of a homoleptic, cyclopentadienylnickel carbide cluster. Moreover, (13)C-labeling studies proved that the carbido ligand in cluster 1 originated from the Ni-bound methyl group. This transformation requires a triple C-H bond activation in the methyl group, which has not been observed so far for late transition metal compounds.

Adres publiczny

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https://www.acs.org/content/acs/en.html