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2,4,6-Triphenylpyridinium-Substituted Neutral Nickel Catalysts: Ethylene Polymerization, Influence of Activator, Catalyst Decomposition, and End-Group Analysis

Autorzy

Mateusz Janeta

Alberto Feliciano Carmona

Xiqu Wang

Maurice Brookhart

Olafs Daugulis

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Streszczenie

The reactivity of 2,4,6-triphenylpyridinium-substi-tuted nickel(II)-salicyliminato catalysts in ethylene polymerization has been explored. The known catalyst 6a equipped with a 2,6-diisopropylphenyl group affords polyethylene with M_n = 10−12 kDa at 19 °C, while 8a possessing the bulkier 2,6-diphenylphenyl
moiety gives polymer with M_h = 270−310 kDa. The stability of catalyst 6a depends on the borane as activator. If $B(C_6F_5)_3$ is employed, enhanced stability is observed compared with that using $3H_2O{\cdot}B(C_6F_5)_3$ activator. Catalyst 6a decomposes to form a hydroxyl-bridged dimer 14 which may be reactivated, albeit inefficiently, by an excess borane activator. The polymer formed by 6a contains ca. 3−6% of 2-trifluoromethylphenyl, pentafluorophenyl, and 3,5 bis(trifluoromethyl)phenyl end groups combined. The pentafluorophenyl end group originates from the reaction of 6a with the borane activator and from the reactivation of hydroxyl-bridged dimer 14. 3,5-Bis(trifluoromethyl)phenyl end groups are likely formed in a reaction sequence initiated by the protonation of
one aryl group in NaBArF that creates $B[C_6H_3(CF_3)_2]_3$. The triarylborane can then react with 6a or 14, transferring the 3,5-bis(trifluoromethyl)phenyl group to nickel.

Słowa kluczowe

Catalysts, Group 13 compounds, Hydrocarbons, Organic compounds, Polymers

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