

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

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Rok wydania

2025

Czasopismo

Organometallics

Numer woluminu

44

Strony

672-683

DOI

10.1021/acs.organomet.4c00512

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The reactivity of 2,4,6-triphenylpyridinium-substituted nickel(II)-salicyliminato catalysts in ethylene polymerization has been explored. The known catalyst 6a equipped with a 2,6-diisopropylphenyl group affords polyethylene with $M_n = 10\text{--}12$ kDa at 19°C , while 8a possessing the bulkier 2,6-diphenylphenyl moiety gives polymer with $M_n = 270\text{--}310$ kDa. The stability of catalyst 6a depends on the borane as activator. If $\text{B}(\text{C}_6\text{F}_5)_3$ is employed, enhanced stability is observed compared with that using $3\text{H}_2\text{O}\cdot\text{B}(\text{C}_6\text{F}_5)_3$ 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 $\text{B}[\text{C}_6\text{H}_3(\text{CF}_3)_2]_3$. 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

Adres publiczny

<http://dx.doi.org/10.1021/acs.organomet.4c00512>

Strona internetowa wydawcy

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

