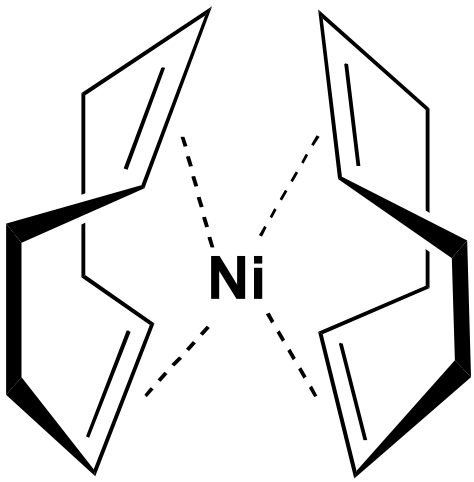
$Ni(COD)_2$

Technical Data



NICHIA CORPORATION

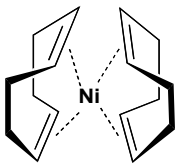
1. Product Guide

Physical and Chemical Properties:

Chemical Name: Bis(1,5-cyclooctadiene)nickel(0)

CAS No.: 1295-35-8

Structural Formula:



Molecular Formula: $C_{16}H_{24}Ni$

Molecular Weight: 275.06

Appearance: Yellow crystalline powder

Purity: 98+% (as Ni)

Solubility: Moderately soluble in aromatic hydrocarbons.
Insoluble in aliphatic hydrocarbons and ethers.

Stability: Air and moisture-sensitive.
Decomposes in halogenated hydrocarbons.
Gradually decomposes in a solution.

Application Examples:

Detailed information is provided on the following pages.

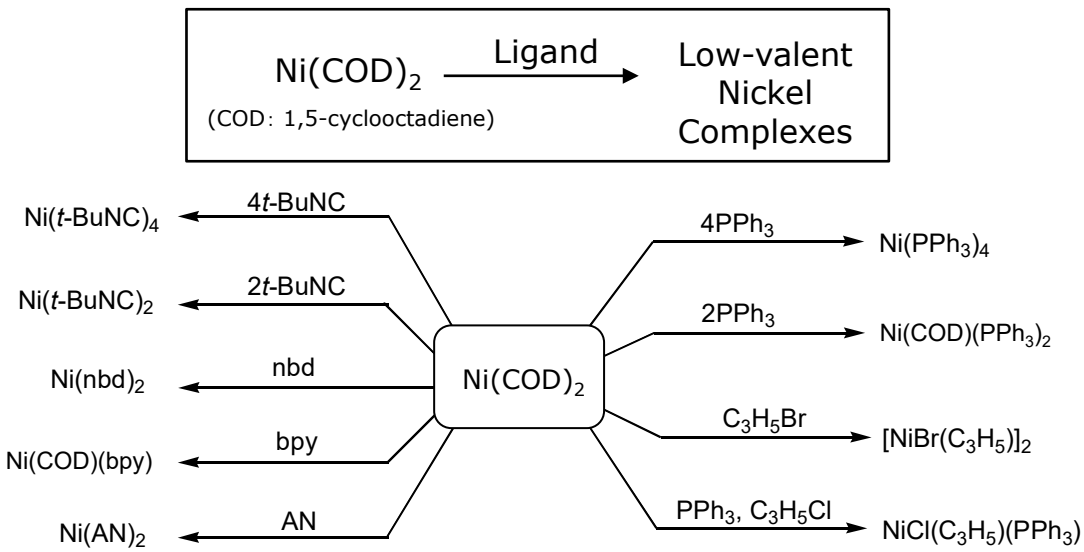
- Synthesis of Low-valent Nickel Complexes
- Olefin Polymerization Reaction
- Coupling Reaction
- Cyclization Reaction
- Additional Reactions

Nichia has its own technical service system.
Nichia can also provide consultation on other nickel complexes.

2. Application in Organic Synthesis

Synthesis of low-valent nickel complexes:

Various low-valent nickel complexes are easily synthesized using $Ni(COD)_2$.



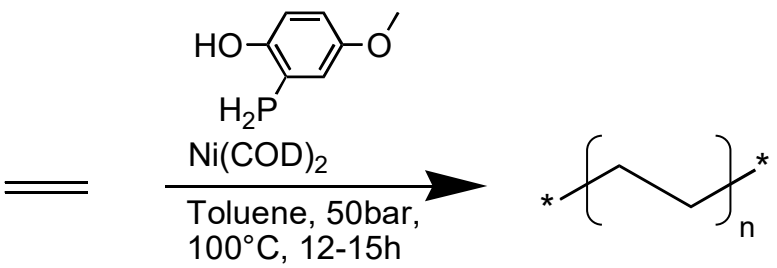
nbd:bicyclo[2.2.1]hepta-2,5-diene, bpy: 2,2'-bipyridyl, AN:acrylonitrile

The 4th series of Experimental Chemistry 18, 371

3. Reaction Examples

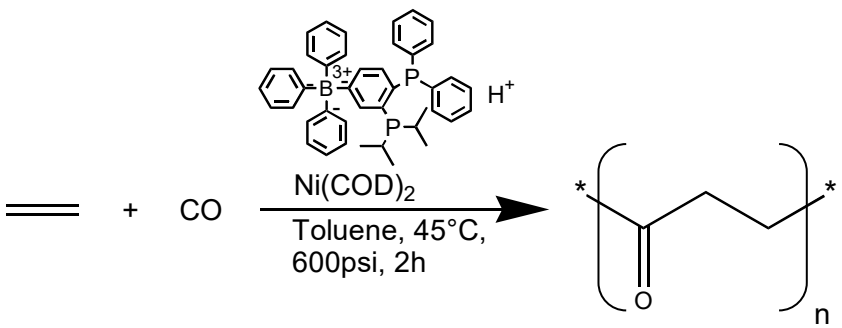
A. Olefin Polymerization Reaction

Ethylene polymerization reaction:



Z. Anorg. Allg. Chem., 633, 1995 (2007)

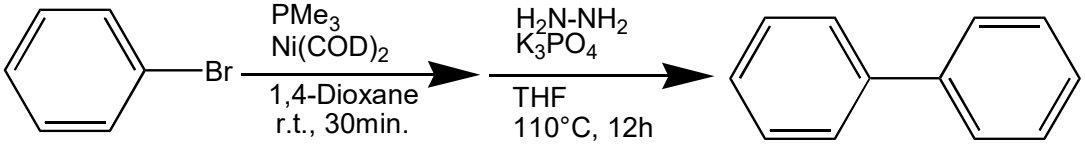
Olefin polymerization reaction using ethylene and carbon monoxide:



Organometallics., 34, 4798 (2015)

B. Coupling Reaction

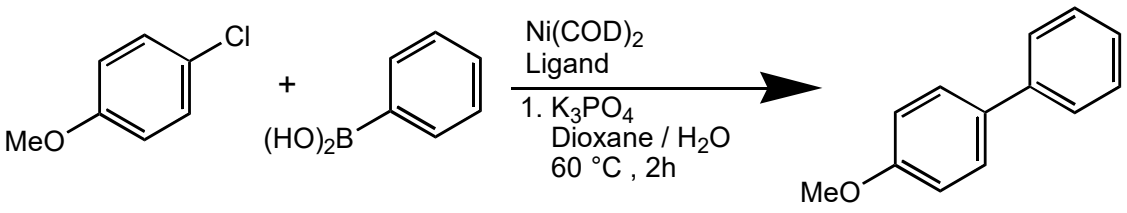
- Homo-coupling reaction of aryl bromide:



Yield : 92%

Nat. Commun., 9, 1-11 (2018)

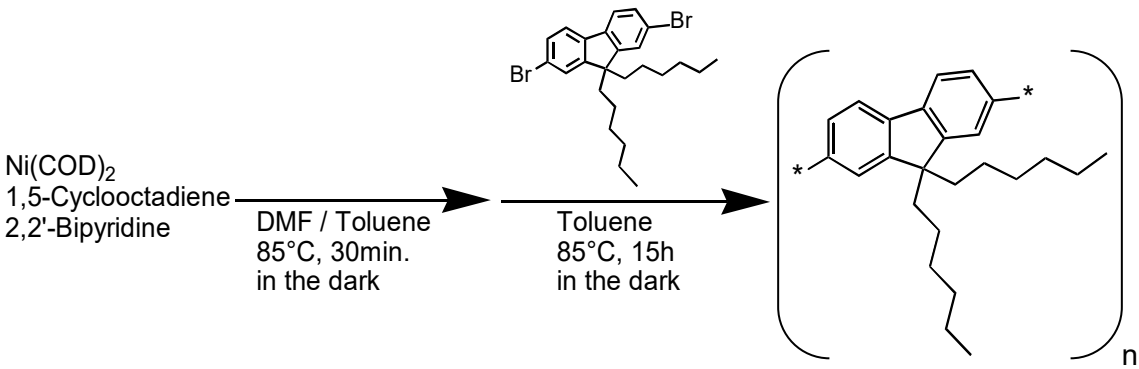
- Cross-coupling reaction of aryl chloride and arylboronic acid:



1. Yield : 100% (Ligand : CyJohnPhos)
2. Yield : 92% (Ligand : PPh_3)

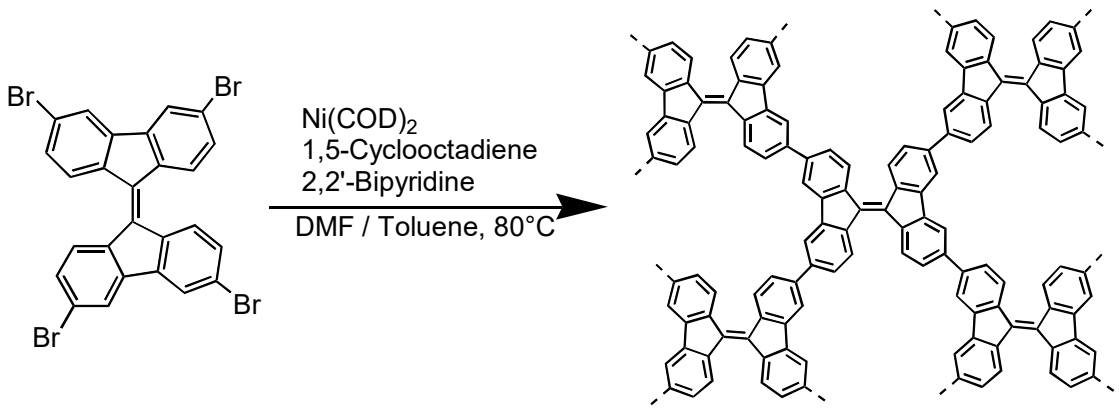
1. *J. Am. Chem. Soc.*, 144, 19635 (2022)
2. *J. Org. Chem.*, 71, 2167 (2006)

- Sequential coupling reactions of fluorene compounds:



Yield : 96%

Macromolcules. 51, 6865 (2018)

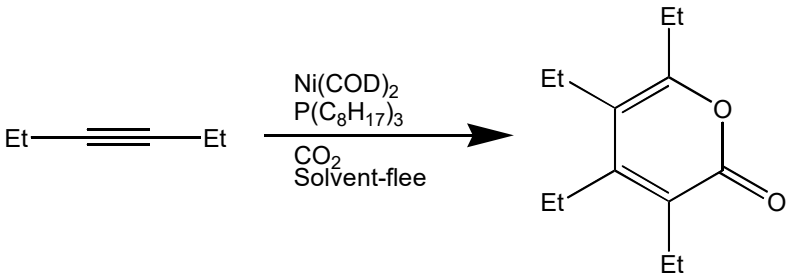


Conjugated microporous polymer (CMPs)

New J. Chem., 46, 17374 (2022)

C. Cyclization Reaction

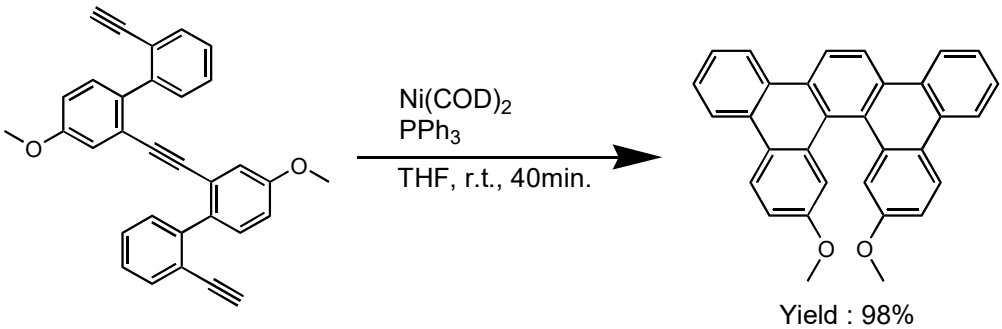
- Synthesis of 2-pyrone derivatives using carbon dioxide:



Yield : 95%

JP2006213687 (A)

- (2+2+2) Cyclization Reaction:

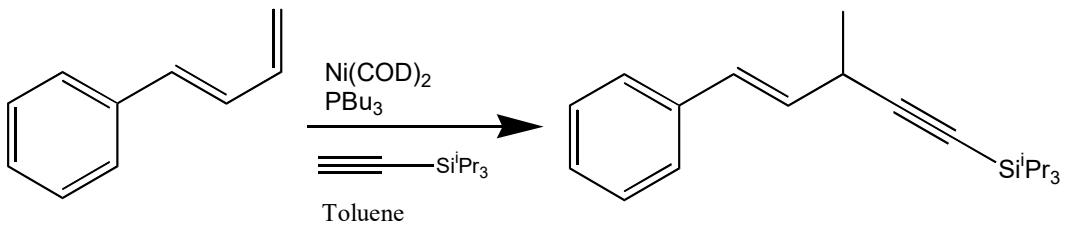


Yield : 98%

Angew. Chem. int. ed., 52, 9970 (2013)

D. Additional Reactions

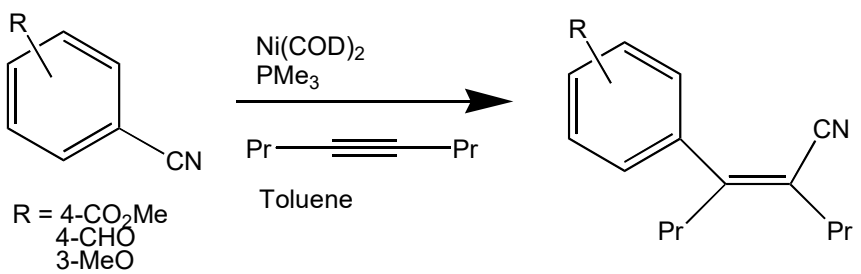
- Addition of terminal alkyne:



Yield : 96%

J. Am. Chem. Soc., 130, 5410 (2008)

- Addition of nitrile:



R = 4-CO_2Me
4-CHO
3-MeO

Yield : 96% (R = CO_2Me)
67% (R = CHO)
70% (R = MeO)

JP2006206548 (A)

■ The information in this document is as of December 2023.

■ Contact:

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