

HOMOGENEOUS CATALYSIS

Precursors

Johnson Matthey offers an extensive range of rhodium, iridium and ruthenium precursors for asymmetric and synthetic organic transformations. These products are manufactured to stringent specifications to ensure lot reproducibility and are available in gram to multi-kilo scale.

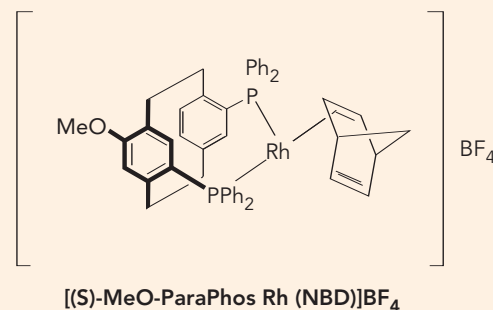
General Applications

Chiral Synthesis

- general asymmetric hydrogenation and transfer hydrogenation
- specific catalysts for imine and ketone hydrogenation

Non Chiral Synthesis

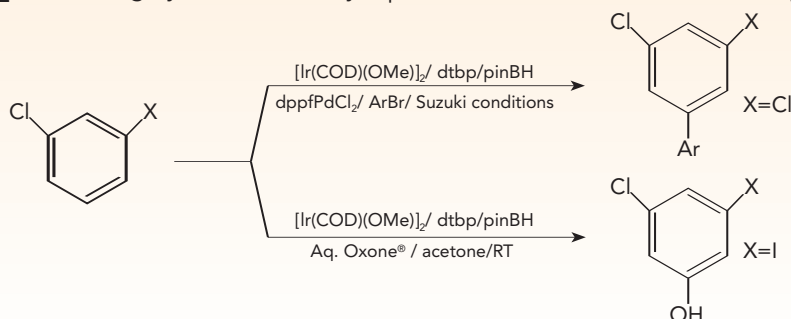
- hydroformylation
- C-H activation
- oxidation
- borylation



Precursor Applications

Ir-92

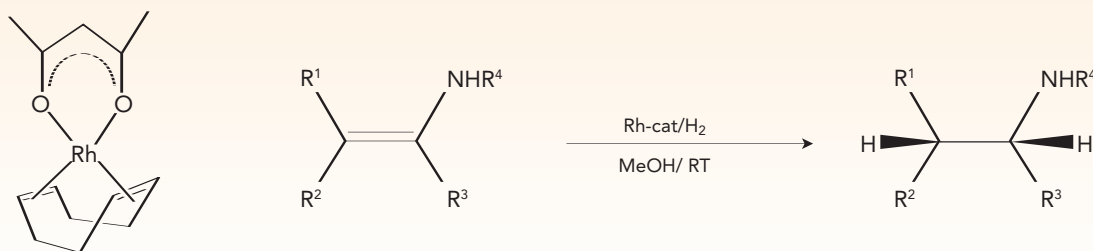
[Ir(COD)(OMe)₂] | A highly efficient catalyst precursor for C-H Activation / Borylation



Ref: Miyaura, et. al., *Chem. Commun.*, **2003**, 2924; R. E. Maleczka, et. al., *J. Am. Chem. Soc.*, **2003**, 125, 7792

Rh-95

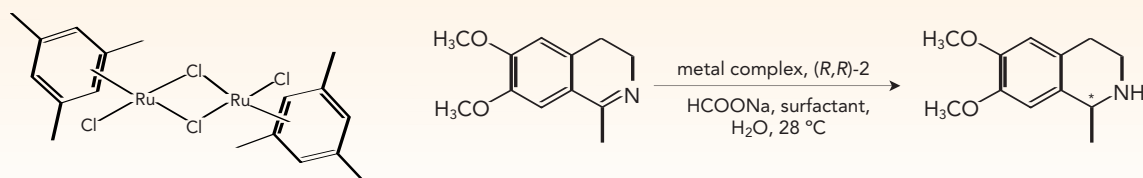
Rh(COD)acac | A highly efficient catalyst precursor for chiral hydrogenation



Ref: U. Berens, et. al., *Eur. J. Org. Chem.*, **2006**, 9, 2100-2109; Y. Ito, et. al., *Tetrahedron: Asymmetry*, **2006**, 17 (4), 521-535

Ru-122

RuCl₂(mesitylene) | An excellent asymmetric transfer hydrogenation catalyst



Ref: J. Wu, et. al., *Chem. Commun.*, **2006**, (16), 1766-1768



Johnson Matthey Catalysts

Catalysis & Chiral Technologies

Catalyst Precursors - Rhodium

Rh-92	chloro(norbornadiene)rhodium(I) dimer	12257-42-0
Rh-93	chloro(1,5-cyclooctadiene)rhodium(I) dimer	12092-47-6
Rh-95	(1,5-cyclooctadiene)(2,4-pentanedionato)rhodium(I)	12245-39-5
Rh-96	bis(1,5-cyclooctadiene)rhodium(I) tetrafluoroborate	35138-22-8
Rh-97	bis(norbornadiene)rhodium(I) tetrafluoroborate	36620-11-8
Rh-98	bis(1,5-cyclooctadiene)rhodium(I) trifluoromethanesulfonate	99326-34-8
Rh-110	rhodium(II) acetate dimer	15956-28-2
Rh-115	rhodium(II) octanoate dimer	73482-96-9
Rh-120	dichloro(pentamethylcyclopentadienyl)rhodium(III) dimer	12354-85-7
Rh-125	bis(norbornadiene)rhodium(I) trifluoromethanesulfonate	178397-71-2
Rh-126	bis(ethene)(2,4-pentanedionato)rhodium(I)	12082-47-2
Rh-127	(norbornadiene)(2,4-pentanedionato)rhodium(I)	32354-50-0
Rh-128	bis(1,5-cyclooctadiene)rhodium(I) hexafluoroantimonate	130296-28-5

Catalyst Precursors - Iridium

Ir-91	chlorobis(cyclooctene)iridium(I) dimer	12246-51-4
Ir-92	1,5 cyclooctadiene(μ -methoxy)iridium(I) dimer	12148-71-9
Ir-93	chloro(1,5-cyclooctadiene)iridium(I) dimer	12112-67-3
Ir-96	bis(1,5-cyclooctadiene)iridium(I) tetrafluoroborate	35138-23-9
Ir-114	bis(1,5-cyclooctadiene)iridium(I) trifluoromethanesulfonate	413621-65-5
Ir-115	dichloro(pentamethylcyclopentadienyl)iridium(III) dimer	12354-84-6

Catalyst Precursors - Ruthenium

Ru-70	tris(2,4-pentanedionato)ruthenium(III)	14284-93-6
Ru-90	dichloro(1,5-cyclooctadiene)ruthenium(II) polymer	50982-13-3
Ru-100	dichlorotris(triphenylphosphine)ruthenium(II)	15529-49-4
Ru-120	dichloro(p-cymene)ruthenium(II) dimer	52462-29-0
Ru-121	diiodo(p-cymene)ruthenium(II) dimer	90614-07-6
Ru-122	dichloro(mesitylene)ruthenium dimer	52462-31-4
Ru-123	dichloro(benzene)ruthenium(II) dimer	37366-09-9
Ru-124	bis(2-methylallyl)(1,5-cyclooctadiene)ruthenium(II)	12289-94-0

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