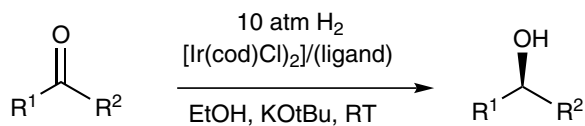


96-0445 Chiral SpiroPAP Ligand Kit 1 kit
This kit contains 25mg of each of the products shown above.

15-5148 **(R)-(+)-7-Bis(3,5-di-t-butylphenyl)phosphino-7'-[(6-methylpyridine-2-ylmethyl)amino]-2,2',3,3'-tetrahydro-1,1'-spirobiindane, min. 98% (>99% ee) (R)-DTB-SpiroPAP-6-Me** [CAS# 1298133-26-2] 25mg
100mg
 $C_{52}H_{65}N_2P$; FW: 749.06; white solid; m.p. 153-155°C; spec. rotation: +191° (c 1.0, CH_2Cl_2); *air sensitive*

Technical Notes:

- Extremely efficient chiral iridium catalyst used for the asymmetric hydrogenation of ketones



R¹ = aryl, alkyl
 R² = Me, Et, nBu

95-99% yields
 88-99.9% ee
 TON up to 4550000

Tech Note (1)
 Ref. (1)

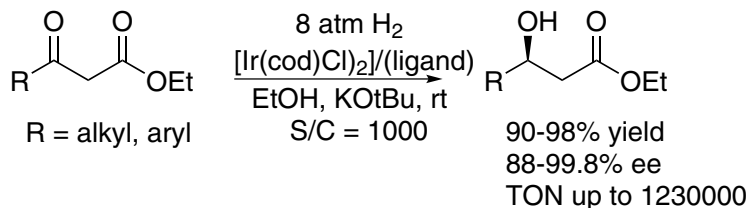
References:

- Angew. Chem. Int. Ed.*, **2011**, *50*, 7329.

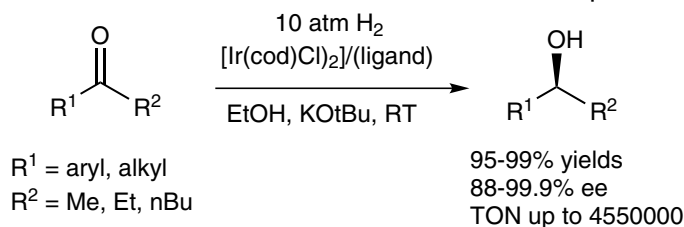
15-5158 (R)-(+)-7-Bis(3,5-di-*t*-butylphenyl)phosphino-7'-[(3-methylpyridine-2-ylmethyl)amino]-2,2',3,3'-tetrahydro-1,1'-spirobiindane, min. 98% (>99% ee) (R)-DTB-SpiroPAP-3-Me [CAS# 1298133-36-4] 25mg
100mg
C₅₂H₆₅N₂P; FW: 749.06; white solid; m.p. 160-161°C; spec. rotation +213 (c 0.5, CH₂Cl₂); *air sensitive*

Technical Notes:

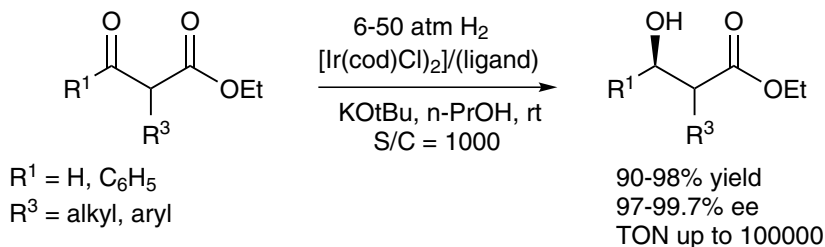
1. Iridium/ligand catalyst for the highly efficient, asymmetric hydrogenation of β-aryl and β-ketoesters.
2. Extremely efficient chiral iridium catalyst used for the asymmetric hydrogenation of ketones.
3. Iridium/ligand catalyst for the highly efficient, asymmetric hydrogenation of β-aryl and β-ketoesters.



Tech Note (1)
Ref. (1)



Tech Note (2)
Ref. (2)



Tech Note (3)
Ref. (3)

References:

1. *Angew. Chem. Int. Ed.*, **2011**, *50*, 7329.
2. *Angew. Chem. Int. Ed.*, **2012**, *51*, 201.
3. *Org. Lett.*, **2012**, *14*, 6158.

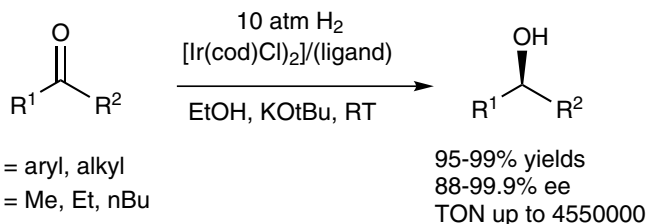
15-5159 (S)-(-)-7-Bis(3,5-di-*t*-butylphenyl)phosphino-7'-[(3-methylpyridine-2-ylmethyl)amino]-2,2',3,3'-tetrahydro-1,1'-spirobiindane, min. 98% (>99% ee) (S)-DTB-SpiroPAP-3-Me 25mg
100mg
C₅₂H₆₅N₂P; FW: 749.06; off-white solid; m.p. 162-164°C; spec. rotation -216° (c 0.5, CH₂Cl₂); *air sensitive*

Technical Notes:

1. See 15-5158.

15-5166 (R)-(+)-7-Bis(3,5-di-*t*-butylphenyl)phosphino-7'-[(pyridine-2-ylmethyl)amino]-2,2',3,3'-tetrahydro-1,1'-spirobiindane, min. 98% (>99% ee) (R)-DTB-SpiroPAP [CAS# 1298133-21-7] 25mg
100mg
C₅₁H₆₃N₂P; FW: 735.03; white solid; m.p. 172-174°C; spec. rotation +172° (c 0.5, CH₂Cl₂); *air sensitive*

Technical Notes:



Tech Note (1)
Ref. (1)

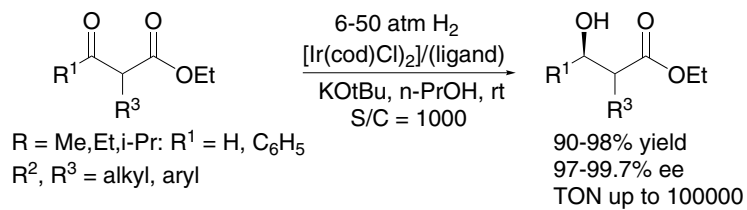
References:

1. *Angew. Chem. Int. Ed.*, **2011**, *50*, 7329.

15-5167 (S)-(-)-7-Bis(3,5-di-*t*-butylphenyl)phosphino-7'-[(pyridine-2-ylmethyl)amino]-2,2',3,3'-tetrahydro-1,1'-spirobiindane, min. 25mg
98% (>99% ee) (S)-DTB-SpiroPAP [CAS# 1415636-82-6] 100mg
C₅₁H₆₃N₂P; FW: 735.03; white solid; m.p. 170-171°C, spec. rotation -175° (c 0.5, CH₂Cl₂); *air sensitive*

Technical Notes:

1. Iridium/ligand catalyst for the highly efficient, asymmetric hydrogenation of β-aryl and β-ketoesters



Tech Note (1)
Ref. (1)

References:

1. *Org. Lett.*, **2012**, *14*, 6158.