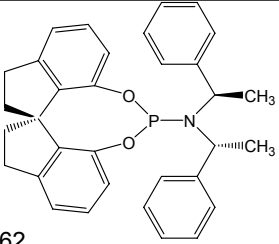
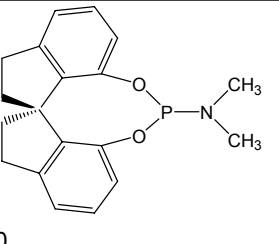
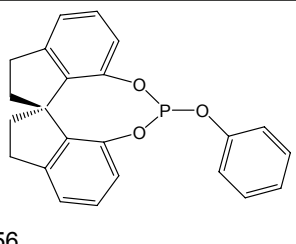
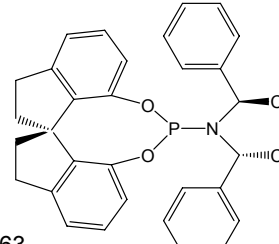
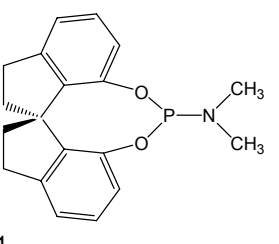
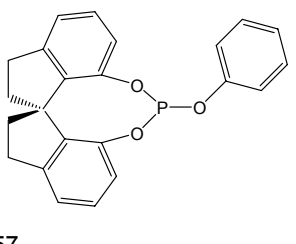


STREM Spiro Monophosphite and Monophosphoramidite Ligand Kit

metals · inorganics · organometallics · catalysts · ligands · custom synthesis · cGMP facilities · nanomaterials

 <p>15-5162</p>	 <p>15-5150</p>	 <p>15-5156</p>
 <p>15-5163</p>	 <p>15-5151</p>	 <p>15-5157</p>

96-0065 Spiro Monophosphite and Monophosphoramidite Ligand Kit – for asymmetric hydrogenations and other transformations
Contains a 100mg unit of each of the items listed below.
Components available for individual sale.

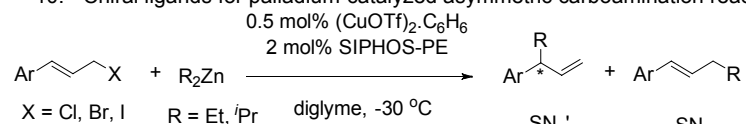
1 kit

15-5162 (11aR)-(+)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-bis[(R)-1-phenylethyl]amine, min. 98% (R)-SIPHOS-PE [500997-69-3]

100mg
500mg

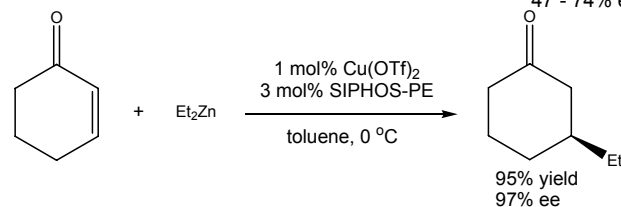
Technical Notes:

1. Chiral ligands for copper-catalyzed asymmetric allylic alkylation with dialkylzincs.
2. Chiral ligands for copper-catalyzed asymmetric conjugate addition of diethylzinc to enones.
3. Chiral ligands for palladium-catalyzed asymmetric hydrosilylation of styrenes
4. Chiral ligands for copper-catalyzed asymmetric ring-opening of oxabicyclic alkenes with Grignard reagents.
5. Chiral ligands for nickel-catalyzed asymmetric hydrovinylation of α -alkyl vinylarenes.
6. Chiral ligands for iridium-catalyzed asymmetric hydrogenation of cyclic enamines.
7. Chiral ligands for iridium-catalyzed asymmetric hydrogenation of cyclic imines.
8. Chiral ligands for gold-catalyzed asymmetric [2 + 2] cycloaddition reaction.
9. Chiral ligands for rhodium-catalyzed asymmetric hydroacylation of salicylaldehydes to homoallylic sulfides.
10. Chiral ligands for palladium-catalyzed asymmetric carboamination reactions.



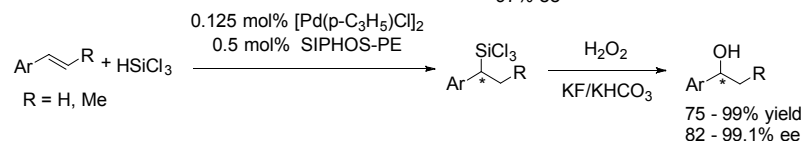
Tech. Note (1)
Ref. (1)

11 - 82% yield of SN₂' + SN₂
SN₂'/SN₂ = 42:58 - 91:9
47 - 74% ee for SN₂'



Tech. Note (2)
Ref. (2)

95% yield
97% ee



Tech. Note (3)
Ref. (3)

75 - 99% yield
82 - 99.1% ee

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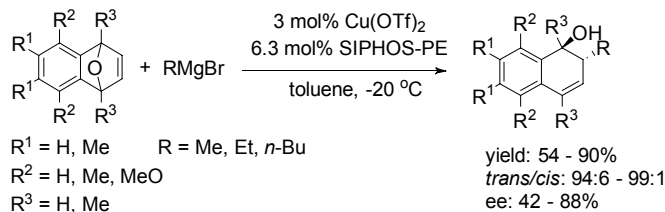
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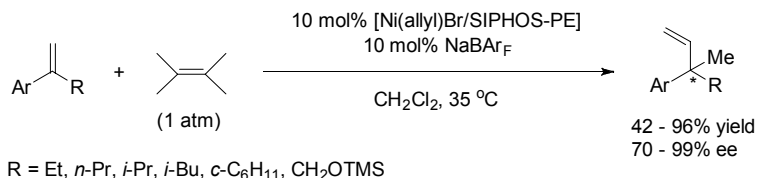
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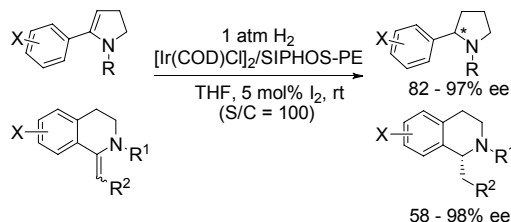
15-5162 (11aR)-(+)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-bis[(R)-1-phenylethyl]amine, min. 98% (cont.) (R)-SIPHOS-PE [500997-69-3]



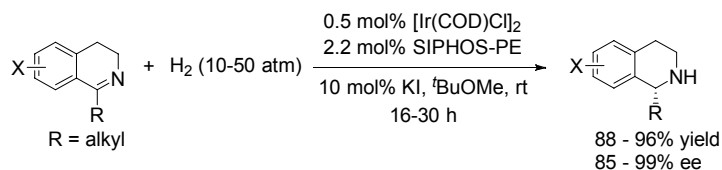
Tech. Note (4)
Ref. (4)



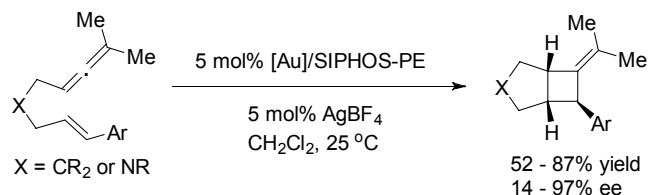
Tech. Note (5)
Ref. (5,6)



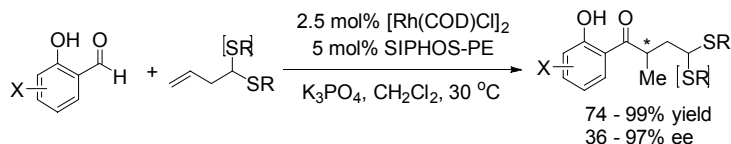
Tech. Note (6)
Ref. (7,8)



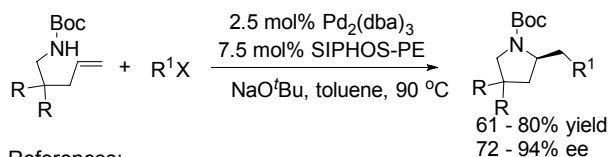
Tech. Note (7)
Ref. (9)



Tech. Note (8)
Ref. (10)



Tech. Note (9)
Ref. (11)



Tech. Note (10)
Ref. (12,13)

References:

1. *Tetrahedron: Asymmetry* **2003**, *14*, 3867.
2. *J. Org. Chem.* **2003**, *68*, 1582.
3. *Tetrahedron: Asymmetry* **2004**, *15*, 2231
4. *J. Org. Chem.* **2005**, *70*, 3734.
5. *J. Am. Chem. Soc.* **2006**, *128*, 2780.
6. *Sci. China Chem.* **2010**, *53*, 1899.
7. *J. Am. Chem. Soc.* **2009**, *131*, 1366.
8. *Adv. Synth. Catal.* **2010**, *351*, 3243.
9. *ACS Catal.* **2012**, *2*, 561.
10. *J. Am. Chem. Soc.* **2011**, *133*, 5500.
11. *J. Am. Chem. Soc.* **2010**, *132*, 16330.
12. *J. Am. Chem. Soc.* **2010**, *132*, 12157.
13. *Org. Lett.* **2011**, *13*, 2932.

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15-5163 (11aS)-(-)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-bis[(R)-1-phenylethyl]amine, min. 98% 100mg
(S)-SIPHOS-PE [500997-70-6] 500mg

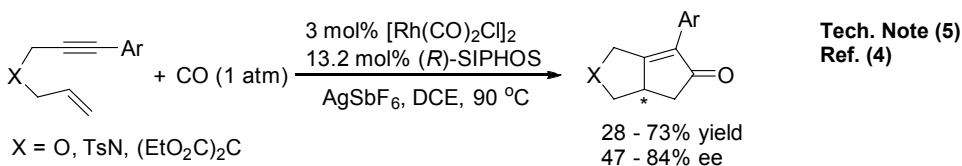
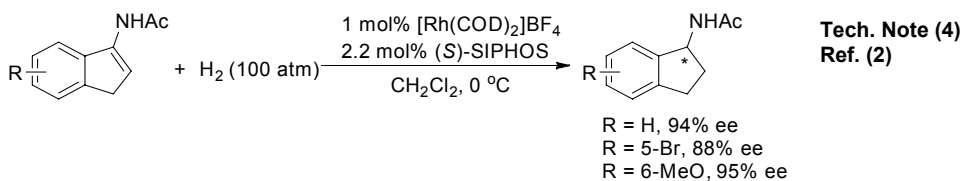
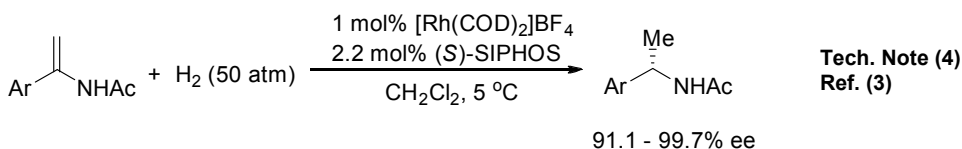
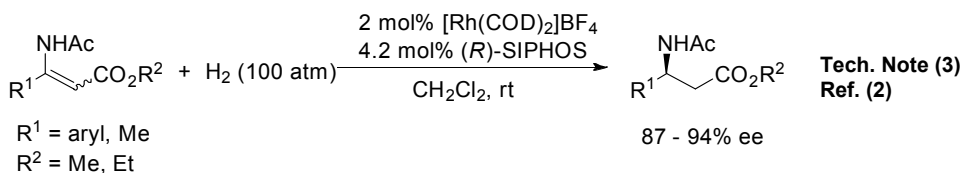
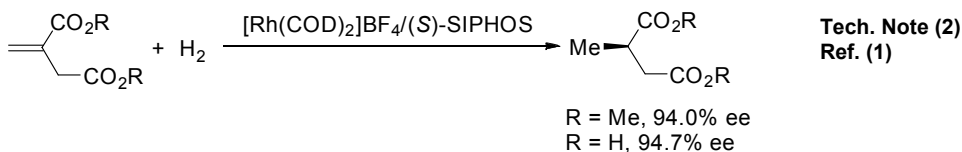
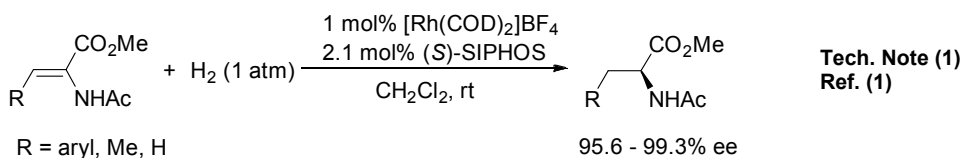
Technical Note:

1. See 15-5162.

15-5150 (11aR)-(+)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-dimethylamine, min. 98% 100mg
(R)-SIPHOS [443965-14-8] 500mg

Technical Notes:

1. Chiral ligands for the rhodium-catalyzed asymmetric hydrogenation of α -dehydroamino esters.
2. Chiral ligands for the rhodium-catalyzed asymmetric hydrogenation of itaconic acid derivatives.
3. Chiral ligands for rhodium-catalyzed asymmetric hydrogenation of β -dehydroaminoesters.
4. Chiral ligands for rhodium-catalyzed asymmetric hydrogenation of enamides.
5. Chiral ligands for rhodium-catalyzed asymmetric Pauson-Khand reaction.
6. Chiral ligands for palladium-catalyzed asymmetric umpolung allylation of aldehydes.



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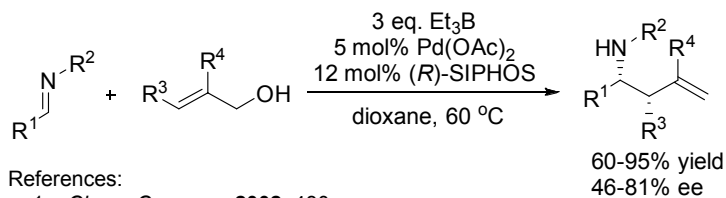
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15-5150 (11aR)-(+)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-dimethylamine, min. 98%
(cont.) (R)-SIPHOS [443965-14-8]



Tech. Note (6)
Ref. (5)

References:

1. *Chem. Commun.* **2002**, 480.
2. *J. Org. Chem.* **2004**, 69, 4648.
3. *Angew. Chem., Int. Ed.* **2002**, 41, 2348.
4. *Adv. Synth. Catal.* **2005**, 347, 759.
5. *Tetrahedron: Asymm.* **2010**, 21, 1216.

15-5151 (11aS)-(-)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-dimethylamine, min. 98% (S)-SIPHOS 100mg
[443965-10-4] 500mg

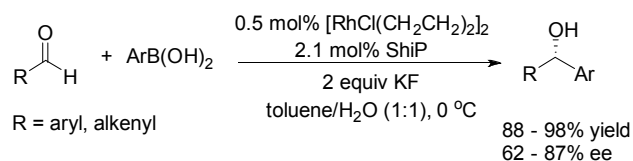
Technical Note:

1. See 15-5150.

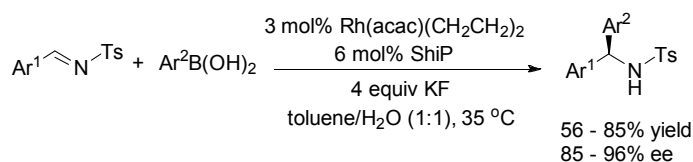
15-5156 (11aR)-(+)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-phenoxy, min. 98% (R)-ShiP [656233-53-3] 100mg
500mg

Technical Notes:

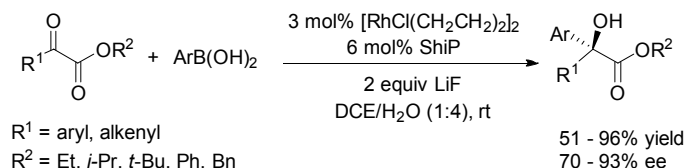
1. Chiral ligands for rhodium-catalyzed arylation of aldehydes with arylboronic acids.
2. Chiral ligands for rhodium-catalyzed arylation of imines with arylboronic acids.
3. Chiral ligands for rhodium-catalyzed arylation of α -ketoesters with arylboronic acids.
4. Chiral ligands for palladium-catalyzed asymmetric umpolung allylation of aldehydes.
5. Chiral ligands for rhodium-catalyzed asymmetric hydrogenation of (Z)- β -arylenamides.



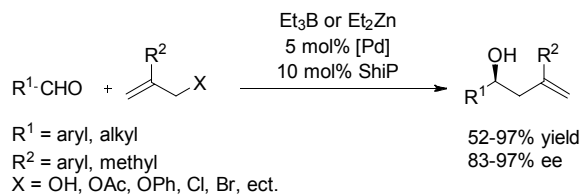
Tech. Note (1)
Ref. (1)



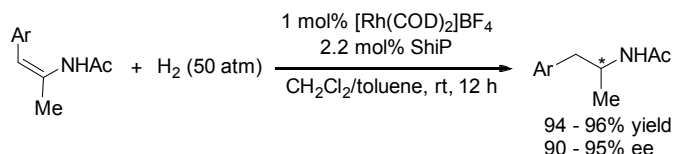
Tech. Note (2)
Ref. (2)



Tech. Note (3)
Ref. (3)



Tech. Note (4)
Ref. (4)



Tech. Note (5)
Ref. (5)

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15-5156 (11aR)-(+)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-phenoxy, min. 98%
(cont.) (R)-ShiP [656233-53-3]

References:

1. *Org. Lett.* **2006**, *8*, 1479.
2. *Org. Lett.* **2006**, *8*, 2567.
3. *Angew. Chem. Int. Ed.* **2008**, *47*, 4351.
4. *Chem. Sci.* **2011**, *2*, 1135.
5. *Tetrahedron* **2012**, *68*, 7685.

15-5157 (11aS)-(-)-10,11,12,13-Tetrahydroindeno[7,1-de:1',7'-fg][1,3,2]dioxaphosphocin-5-phenoxy, min. 98% (S)-ShiP 100mg
[885701-71-3] 500mg

Technical Note:

1. See 15-5156.
-

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