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Catalog # 96-3655 Solvias (R)-MeO-BIPHEP Ligand Kit

Components include 100mg of the nine items listed below:

| | | |
|----------------------------|----------------------------|----------------------------|
| Cat. #15-0178 100mg | Cat. #15-0042 100mg | Cat. #15-0112 100mg |
| Cat. #15-0488 100mg | Cat. #15-0654 100mg | Cat. #15-0156 100mg |
| Cat. #15-0044 100mg | Cat. #15-0158 100mg | Cat. #15-0652 100mg |

96-3656 Solvias (S)-MeO-BIPHEP Ligand Kit - components include 100mg of the nine S-enantiomers of the ligands contained in the (R)-Kit (#96-3655) above.

1 kit

| | | |
|---------|---|-----------------------------|
| 15-0178 | (R)-(+)-2,2'-Bis(diphenylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% (R)-MeO-BIPHEP [133545-16-1] C ₃₈ H ₃₂ O ₂ P ₂ ; FW: 582.53; off-white xtl. | 100mg 500mg 2g 10g |
|---------|---|-----------------------------|

Technical Notes:

In many respects the catalytic profile of the MeOBIPHEP ligands is similar to that of other atropisomeric diphosphines such as binap and its many analogs. The nature of the PR₂ group strongly influences the catalytic performance of the metal complexes. The rhodium and ruthenium MeO-BIPHEP catalysts are highly effective for the hydrogenation of various C=O, C=C and C=N bonds and several synthetically useful CC coupling reactions.

1. Ru catalyzed asymmetric hydrogenation of β-keto esters, β-keto sulfones and α-keto amides.
2. Ru and Ir catalyzed dynamic kinetic resolution for the synthesis of β-hydroxy-α-amino acid derivatives.
3. Ru catalyzed hydrogenation of C=C bonds, especially α,β-unsaturated acids, allylic alcohols and with other activated groups.
4. Ir catalyzed enantioselective hydrogenation of heteroaromatic compounds.
5. Various asymmetric C-C coupling reactions such as Rh catalyzed reductive coupling of acetylene to aldehydes and α-ketoesters, Pt catalyzed intramolecular hydroarylation of unactivated alkenes with indoles and glyoxylate-ene reaction or the Pd catalyzed enantioselective Heck reaction of p-XC₆H₄OTf (X = OMe, H, CO₂Me) with dihydrofuran.

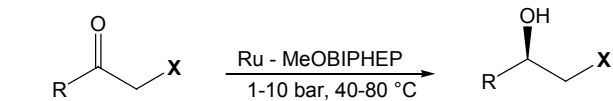
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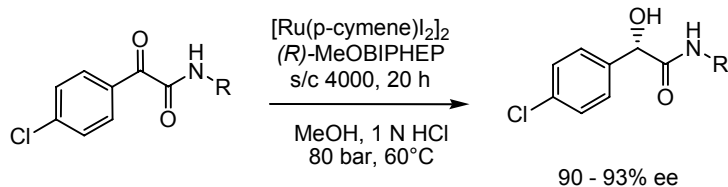
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Tech. Note (1)
Ref. (1-3)

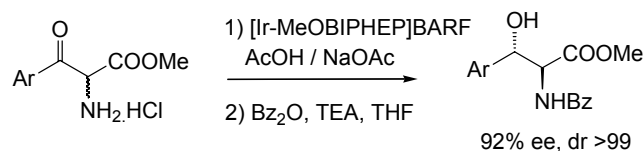
R = alkyl, (subst) Ph, Np
X = COOR', SO₂Ph

88-97% ee



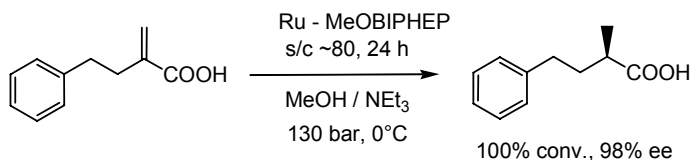
Tech. Note (1)
Ref. (4)

90 - 93% ee



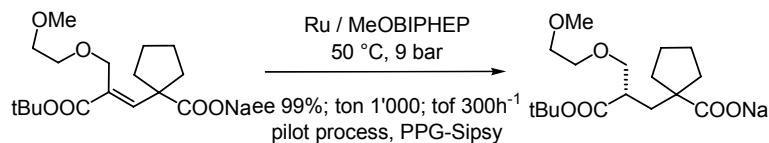
Tech. Note (2)
Ref. (5)

92% ee, dr >99



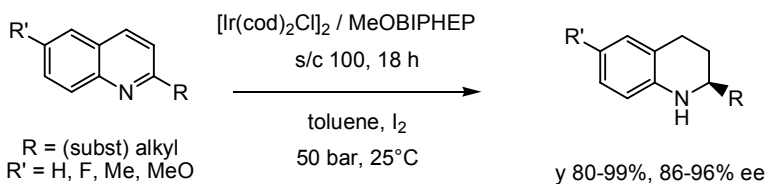
Tech. Note (3)
Ref. (6-9)

100% conv., 98% ee



Tech. Note (3)
Ref. (10)

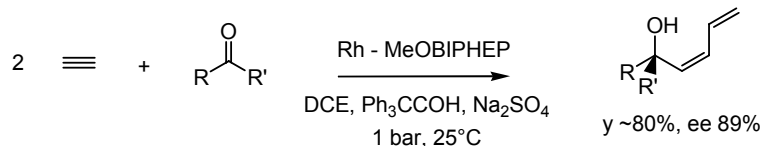
99%; ton 1'000; tof 300h⁻¹
pilot process, PPG-Sipsy



Tech. Note 4)
Ref. (11)

R = (subst) alkyl
R' = H, F, Me, MeO

y 80-99%, 86-96% ee



Tech. Note (5)
Ref. (12)

y ~80%, ee 89%

References:

1. *Adv. Synth. Catal.* **2003**, 345, 261.
2. *J. Organomet. Chem.* **2000**, 603, 128.
3. *Tetrahedron: Asymmetry* **1999**, 10, 1369.
4. *Adv. Synth. Catal.* **2004**, 346, 842.
5. *Org. Lett.* **2006**, 8, 4573.
6. *Tetrahedron Lett.* **2006**, 47, 9261.
7. *Comprehensive Asymmetric Catalysis*, **1999**, 1439.
8. *Chimia* **1997**, 51, 303.
9. *J. Am. Chem. Soc.* **2003**, 125, 8779.
10. *Org. Process Res. Devel.* **2001**, 5, 438.
11. *J. Am. Chem. Soc.* **2003**, 125, 10536.
12. *J. Am. Chem. Soc.* **2006**, 128, 16040.

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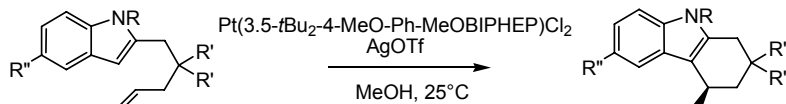
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|---------|---|-----------------------------|
| 15-0042 | (R)-(-)-2,2'-Bis[di(3,5-di- <i>t</i> -butyl-4-methoxyphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [352655-61-9] C ₇₄ H ₁₀₄ O ₆ P ₂ ; FW: 1151.60; white xtl. | 100mg 500mg 2g 10g |
|---------|---|-----------------------------|

Technical Note:

- Various asymmetric C-C coupling reactions such as Rh catalyzed reductive coupling of acetylene to aldehydes and α -ketoesters, Pt catalyzed intramolecular hydroarylation of unactivated alkenes with indoles and glyoxylate-ene reaction or the Pd catalyzed enantioselective Heck reaction of *p*-XC₆H₄OTf (X = OMe, H, CO₂Me) with dihydrofuran.
- See 15-0178.



Reference:

- Org. Lett.* **2006**, *8*, 3801.

| | | |
|---------|--|-----------------------------|
| 15-0112 | (R)-(+)-2,2'-Bis(di-2-furanylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [145214-57-9] C ₃₀ H ₂₄ O ₆ P ₂ ; FW: 542.47; off-white powdr. | 100mg 500mg 2g 10g |
|---------|--|-----------------------------|

Technical Note:

- See 15-0178.

| | | |
|---------|---|-----------------------------|
| 15-0488 | (R)-(+)-2,2'-Bis(di(3,5-xylyl)phosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [394248-45-4] C ₄₆ H ₄₈ O ₂ P ₂ ; FW: 694.84; white powdr. | 100mg 500mg 2g 10g |
|---------|---|-----------------------------|

Technical Note:

- See 15-0178.

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|---------|--|-----------------------------|
| 15-0654 | (R)-(+)-2,2'-Bis(di- <i>i</i> -propylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [150971-45-2] C ₂₆ H ₄₀ O ₂ P ₂ ; FW: 446.56; white powdr. | 100mg 500mg 2g 10g |
|---------|--|-----------------------------|

Technical Note:

- See 15-0178.

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|---------|---|-----------------------------|
| 15-0156 | (R)-(+)-2,2'-Bis(di- <i>p</i> -tolylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [133545-24-1] C ₄₂ H ₄₀ O ₂ P ₂ ; FW: 638.73; white powdr. | 100mg 500mg 2g 10g |
|---------|---|-----------------------------|

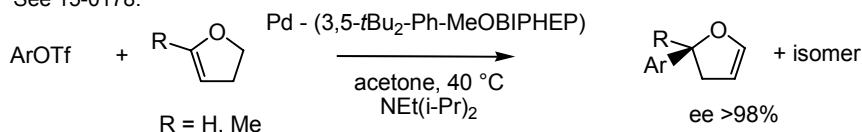
Technical Note:

- See 15-0178.

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|---------|--|-----------------------------|
| 15-0044 | (R)-(+)-2,2'-Bis[di(3,5-di- <i>t</i> -butylphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [192138-05-9] C ₇₀ H ₉₆ O ₂ P ₂ ; FW: 1031.49; white powdr. | 100mg 500mg 2g 10g |
|---------|--|-----------------------------|

Technical Notes:

- Various asymmetric C-C coupling reactions such as Rh catalyzed reductive coupling of acetylene to aldehydes and α -ketoesters, Pt catalyzed intramolecular hydroarylation of unactivated alkenes with indoles and glyoxylate-ene reaction or the Pd catalyzed enantioselective Heck reaction of *p*-XC₆H₄OTf (X = OMe, H, CO₂Me) with dihydrofuran.
- See 15-0178.



Reference:

- Organometallics* **1999**, *18*, 670.

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|-------------------------------------|---|-----------------------------|
| 15-0158 | (R)-(+)-2,2'-Bis[di(3,4,5-trimethoxyphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [256390-47-3] C ₅₀ H ₅₆ O ₁₄ P ₂ ; FW: 942.94; off-white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| 15-0652 | (R)-(-)-2,2'-Bis[di(3,5-di-i-propyl-4-dimethylaminophenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [352655-40-4] C ₇₀ H ₁₀₀ N ₄ O ₂ P ₂ ; FW: 1091.55; white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| (S)-enantiomers listed below | | |
| 15-0179 | (S)-(-)-2,2'-Bis(diphenylphosphino)-6,6'-dimethoxy-1,1'-biphenORyyl, min. 97% (S)-MeO-BIPHEP [133545-17-2] C ₃₈ H ₃₂ O ₂ P ₂ ; FW: 582.53; white xtl. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| 15-0043 | S-(+)-2,2'-Bis[di(3,5-di-t-butyl-4-methoxyphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [910134-30-4] C ₇₄ H ₁₀₄ O ₆ P ₂ ; FW: 1151.60; white xtl. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0042. | | |
| 15-0113 | (S)-(-)-2,2'-Bis(di-2-furanylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [145214-59-1] C ₃₀ H ₂₄ O ₆ P ₂ ; FW: 542.47; off-white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| 15-0489 | (S)-(-)-2,2'-Bis[di(3,5-xylyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [362634-22-8] C ₄₆ H ₄₈ O ₂ P ₂ ; FW: 694.84; white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| 15-0655 | (S)-(-)-2,2'-Bis(di-i-propylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [150971-43-0] C ₂₆ H ₄₀ O ₂ P ₂ ; FW: 446.56; white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| 15-0157 | (S)-(-)-2,2'-Bis(di-p-tolylphosphino)-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [133545-25-2] C ₄₂ H ₄₀ O ₂ P ₂ ; FW: 638.73; white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0178. | | |
| 15-0045 | (S)-(-)-2,2'-Bis[di(3,5-di-t-butylphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [167709-31-1] C ₇₀ H ₉₆ O ₂ P ₂ ; FW: 1031.49; white powdr. | 100mg 500mg 2g 10g |
| Technical Note: 1. See 15-0044. | | |

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|---------|--|-----------------------------|
| 15-0159 | (S)-(-)-2,2'-Bis[di(3,4,5-trimethoxyphenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [256235-61-7] $C_{50}H_{56}O_{14}P_2$; FW: 942.94; off-white powdr. | 100mg 500mg 2g 10g |
|---------|--|-----------------------------|

Technical Note:
1. See 15-0178.

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|---------|--|-----------------------------|
| 15-0653 | (S)-(+)-2,2'-Bis[di(3,5-di-i-propyl-4-dimethylaminophenyl)phosphino]-6,6'-dimethoxy-1,1'-biphenyl, min. 97% [919338-66-2] $C_{70}H_{100}N_4O_2P_2$; FW: 1091.55; white powdr. | 100mg 500mg 2g 10g |
|---------|--|-----------------------------|

Technical Note:
1. See 15-0178.

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