

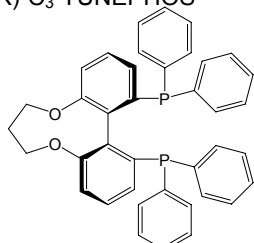
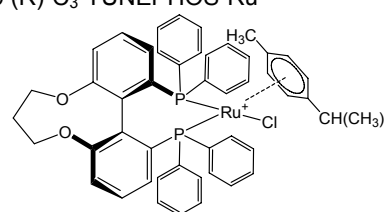
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Cat. # 96-5900

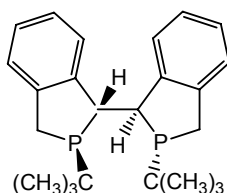
1kit

Chiral Quest Catalyst and Ligand Toolbox Kit for Asymmetric Hydrogenation

Contains 100mg of each of the items listed below.

 Cat. # 15-0175 (R)-C₃-TUNEPHOS

 Cat. # 44-0109 (R)-C₃-TUNEPHOS-Ru

 Cat. # 15-0176 (S)-C₃-TUNEPHOS

Cat. # 15-1060 (R,R,S,S)-DUANPHOS


Available in 100mg and 500mg standard sizes. Kit also available.
15-0175 R-(-)-1,13-Bis(diphenylphosphino)-7,8-dihydro-6H-dibenzo[f,h][1,5]dioxonin, 97% (R)-C₃-TUNEPHOS

 [301847-89-2] C₃₉H₃₂O₂P₂; FW: 594.62; white powdr.

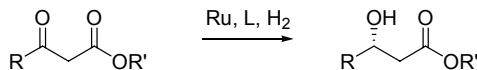
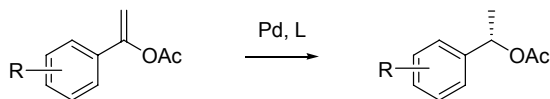
air sensitive

Note: US Patent No. 6,521,769; additional patents pending.

 100mg
 500mg

Technical Notes:

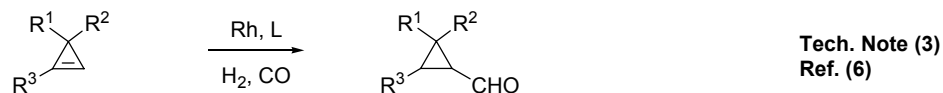
1. New generation of chiral biaryl phosphine ligands with tunable dihedral angles. The ability to modify the dihedral angle allows for the fine tuning of the catalyst system and optimization of enantioselectivity.
2. Ru-C₃-TUNEPHOS complexes are used for asymmetric hydrogenation of β-ketoesters¹, enol acetates², cyclic β-amino acids³, α-phthalimide ketones⁴, and α-keto esters⁵.
3. Rh-catalyzed hydroformylation of cyclopropenes.


Tech. Note (2)
Ref. (1)

Tech. Note (2)
Ref. (2)

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 Email: info@strem.com
Strem Chemicals, Inc.
 15, rue de l'Atome
 Zone Industrielle
 67800 BISCHHEIM France
 Tel.: (33) 03 88 62 52 60
 Fax: (33) 03 88 62 26 81
 Email: info.europe@strem.com
Strem Chemicals, Inc.
 Postfach 1215
 77672 KEHL
 Germany
 Telefon: 0 78 51/ 7 58 79
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 Newton, Cambridge
 England CB22 7ZE
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 Fax: 0845 643 7362
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15-0175 (cont.) **R(-)-1,13-Bis(diphenylphosphino)-7,8-dihydro-6H-dibenzo[f,h][1,5]dioxonin, 97% (R)-C₃-TUNEPHOS**
 [301847-89-2]



References:

1. *J. Org. Chem.*, **2000**, 65, 6223.
2. *Org. Lett.*, **2002**, 4, 4495.
3. *J. Am. Chem. Soc.*, **2003**, 125, 9570.
4. *J. Am. Chem. Soc.*, **2004**, 126, 1626.
5. *Synlett.*, **2006**, 126, 1169.
6. *J. Am. Chem. Soc.*, **2008**, 130, 13804.

15-0176 (S)-(+)-1,13-Bis(diphenylphosphino)-7,8-dihydro-6H-dibenzo[f,h][1,5]dioxonin, 95% (S)-C₃-TUNEPHOS 100mg
 [486429-99-6] C₃₉H₃₂O₂P₂; FW: 594.62; white powdr. 500mg
air sensitive
 Note: US Patent No. 6,521,769; additional patents pending.

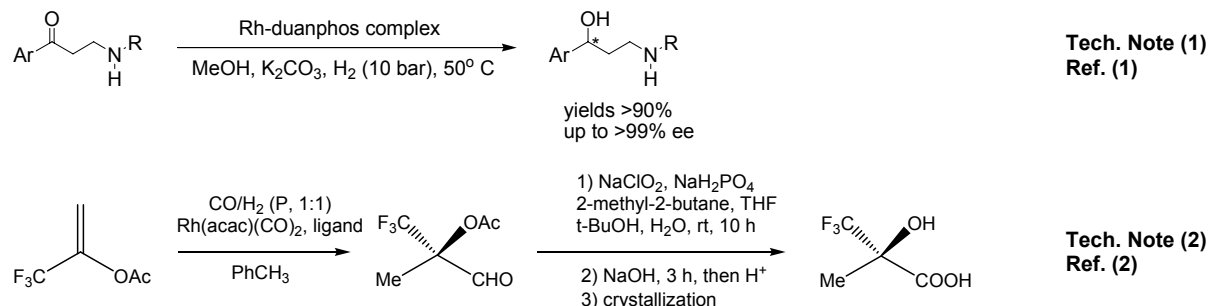
Technical Note:

1. See 15-0175.

15-1060 (1R,1'R,2S,2'S)-(+)-2,2'-Di-t-butyl-2,3,2',3'-tetrahydro-1,1'-bi-1H-isophosphindole, min. 98% (R,R,S,S)-DUANPHOS 100mg
 [528814-26-8] C₂₄H₃₂P₂; FW: 382.46; white xtl.; [α]_D +19.5 500mg
air sensitive
 Note: Patent pending, PCT/US02/35788.

Technical Notes:

1. As a highly electron-donating and conformationally rigid ligand, the rhodium complex of DuanPhos has exhibited remarkably high enantioselectivities and reactivities for the hydrogenation of a variety of functionalized olefins.
2. Rhodium/DUANPHOS catalyst used in the synthesis of 2-trifluoromethyl lactic acid by asymmetric hydroformylation.



References:

1. *Angew. Chem. Int. Ed.*, **2005**, 44, 1687.
2. *J. Org. Chem.*, **2013**, 78, 3429.

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Strem Chemicals, Inc.
 15, rue de l'Atome
 Zone Industrielle
 67800 BISCHHEIM France
 Tel.: (33) 03 88 62 52 60
 Fax: (33) 03 88 62 26 81
 Email: info.europe@strem.com

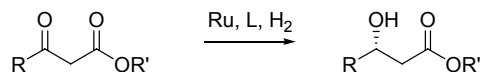
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 Germany
 Telefon: 0 78 51/ 7 58 79
 Email: info.europe@strem.com

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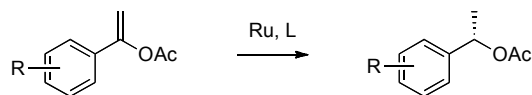
44-0109 Chloro{(R)-(-)-1,13-bis(diphenylphosphino)-7,8-dihydro-6H-dibenzo[f,h][1,5]dioxonin}(p-cymene) ruthenium(II) chloride (R)-C₃-TUNEPHOS-Ru 100mg
500mg
[RuCl(C₃₉H₃₂O₂P₂)(C₁₀H₁₄)]⁺Cl⁻; FW: 900.81; orange to brown powdr.
air sensitive
Note: Patent US 6,521,769.

Technical Notes:

1. New generation of chiral biaryl phosphine ligands with tunable dihedral angles. The ability to modify the dihedral angle allows for the fine tuning of the catalyst system and optimization of enantioselectivity. See 15-0175 (page [1](#)!).
2. Ru-C₃-TUNEPHOS complexes are used for asymmetric hydrogenation of β-ketoesters¹, enol acetates², cyclic β-amino acids³, α-phthalimide ketones⁴, and α-keto esters⁵.



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Tel.: (978) 499-1600
Fax: (978) 465-3104
Email: info@strem.com

Strem Chemicals, Inc.
15, rue de l'Atome
Zone Industrielle
67800 BISCHHEIM France
Tel.: (33) 03 88 62 52 60
Fax: (33) 03 88 62 26 81
Email: info.europe@strem.com

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