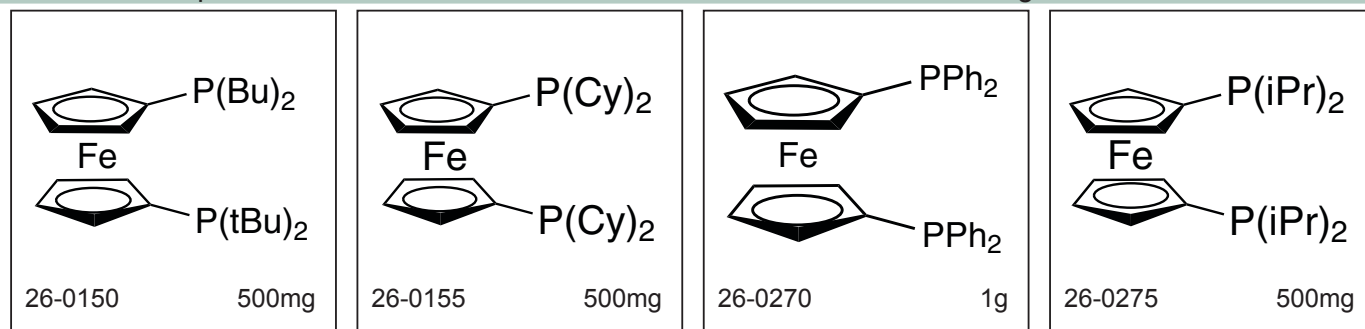


STREM 1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand & Catalyst Kits

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96-3730 1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit

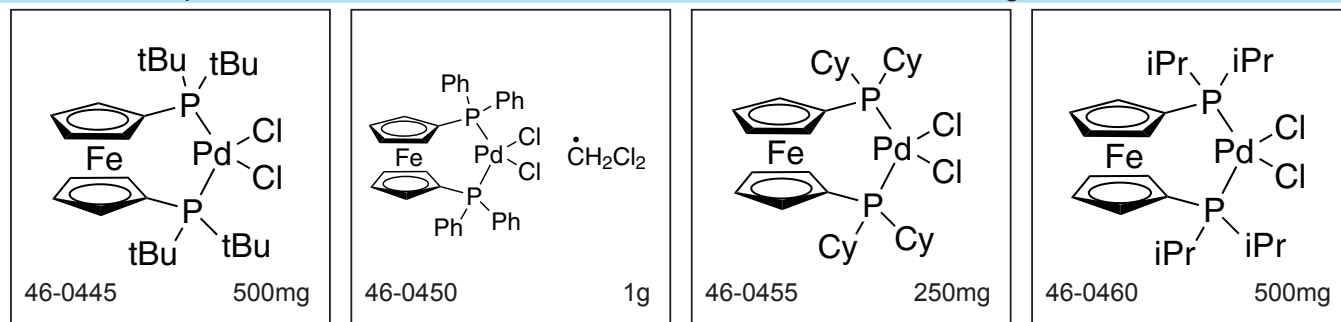
Components also available for individual sale. Contains the following:



26-0150	1,1'-Bis(di-t-butylphosphino)ferrocene, min. 98% DTBPF (84680-95-5)	500mg
26-0155	1,1'-Bis(dicyclohexylphosphino)ferrocene, min. 98% (146960-90-9)	500mg
26-0270	1,1'-Bis(diphenylphosphino)ferrocene, 99% DPPF (12150-46-8)	1g
26-0275	1,1'-Bis(di-i-propylphosphino)ferrocene, min. 98% DiPPF (97239-80-0)	500mg

96-3735 [1,1'-Bis(dialkyl/diarylphosphino)ferrocene]palladium(II) dichloro Catalyst Kit

Components also available for individual sale. Contains the following:



46-0445	Dichloro[1,1'-bis(di-t-butylphosphino)ferrocene]palladium(II), 99% (95408-45-0)	500mg
46-0450	Dichloro 1,1'-bis(diphenylphosphino)ferrocene palladium (II) dichloromethane, 99% (95464-05-4)	1g
46-0455	Dichloro[1,1'-bis(dicyclohexylphosphino)ferrocene]palladium(II), dichloromethane adduct, 99% (917511-90-1)	250mg
46-0460	Dichloro[1,1'-bis(di-i-propylphosphino)ferrocene]palladium(II), 99% (215788-65-1)	500mg

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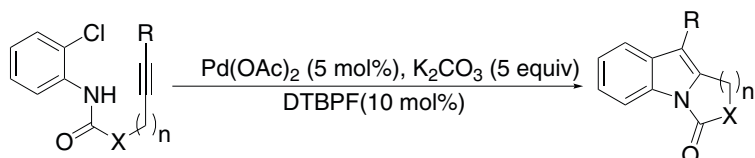
1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit Components

26-0150 1,1'-Bis(di-*t*-butylphosphino)ferrocene, min. 98% DTBPF (84680-95-5)
 $[(C_4H_9)_2PC_5H_4]_2Fe$; FW: 474.42; orange to red xtl.

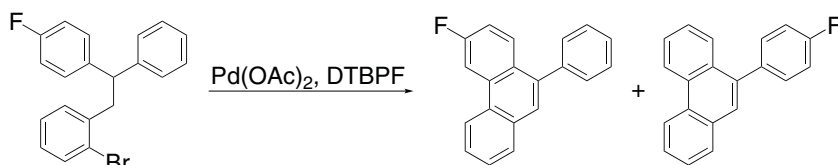
500mg
2g
10g

Technical Notes:

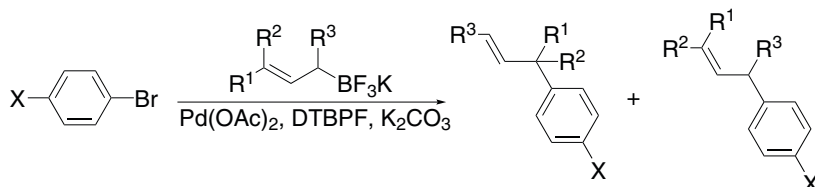
1. Ligand for synthesis of polycyclic indoles via Pd-catalyzed intramolecular heteroannulation.
2. Ligand for the palladium-catalyzed intramolecular arylation of aryl bromides under mild conditions.
3. Ligand for cross-coupling reactions between bromoarenes and potassium allyltrifluoroborates promoted by a catalyst prepared from $Pd(OAc)_2$ and DTBPF selectively providing γ -coupling products.
4. Ligand for the copper-catalyzed system for the β -boration of a variety of α,β -unsaturated amides.
5. Ligand for the synthesis of Paucifloral F and related indanone analogues via palladium-catalyzed α -arylation.
6. Ligand for the Pd-carbon monoxide complex catalyzed hydroxycarbonylation of aryl halides.
7. Ligand for the palladium-catalyzed b-C-glycosylation by decarboxylative allylation to normal pyran systems, and cis-2,6-disubstituted tetrahydropyrans.
8. Pd-catalyzed dearomatative indole bisfunctionalization via a diastereoselective arylation.
9. Ligand for the copper- DTBPF catalyzed C-H activation and carboxylation of terminal alkynes.



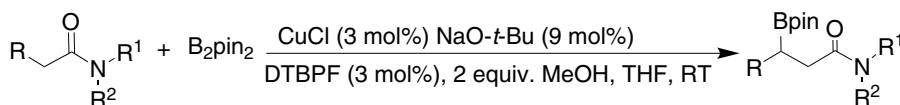
Tech. Note (1)
Ref. (1)



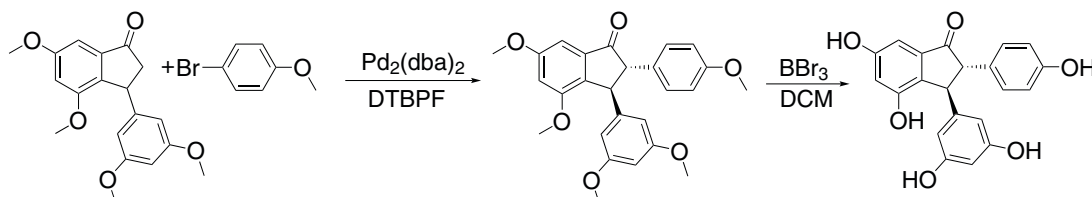
Tech. Note (2)
Ref. (2)



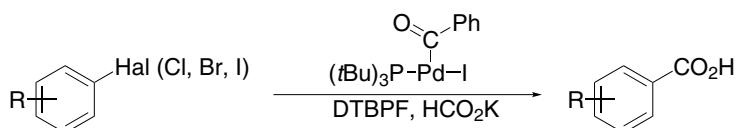
Tech. Note (3)
Ref. (3)



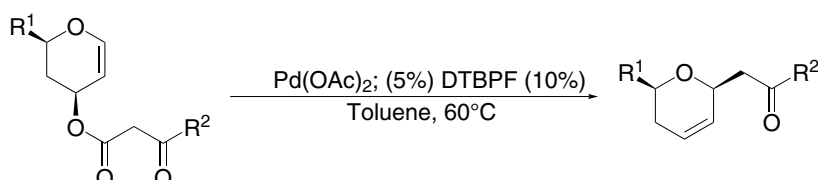
Tech. Note (4)
Ref. (4)



Tech. Note (5)
Ref. (5)



Tech. Note (6)
Ref. (6)



Tech. Note (7)
Ref. (7)

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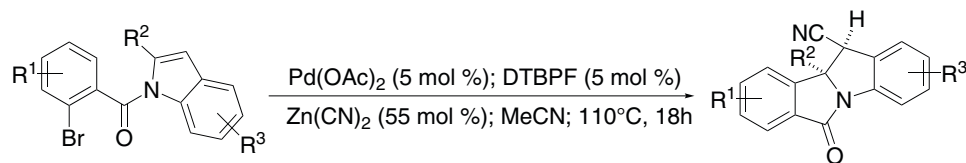
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1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit Components



Tech. Note (8)
Ref. (8)



Tech. Note (9)
Ref. (9)

References:

1. *Org. Lett.*, **2006**, 8, 3573.
2. *Tetrahedron*, **2008**, 64, 6021.
3. *Organometallics*, **2009**, 28, 152.
4. *Adv. Synth. Catal.*, **2009**, 351, 855.
5. *J. Org. Chem.*, **2011**, 76, 1902.
6. *J. Am. Chem. Soc.*, **2013**, 135, 2891.
7. *Chem. Eur. J.*, **2014**, 20, 405.
8. *Org. Lett.*, **2015**, 17, 4838.
9. *Dalton Trans.*, **2015**, 44, 20874.

26-0155 1,1'-Bis(dicyclohexylphosphino)ferrocene, min. 98% (146960-90-9)

[(C₆H₁₁)₂P(C₅H₄)₂]₂Fe; FW: 578.57; orange powdr.; m.p. 138°

air sensitive

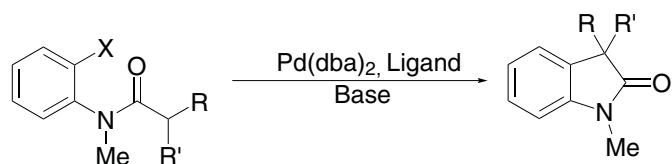
500mg

2g

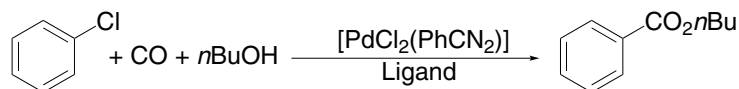
10g

Technical Notes:

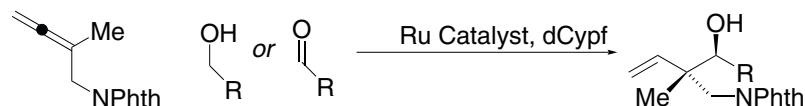
1. Ligand for palladium-catalyzed synthesis of oxindoles by amide α -arylation
2. Ligand for palladium-catalyzed alkoxyacylation of aryl chlorides.
3. Ligand for ruthenium-catalyzed alcohol-allene C-C coupling reaction via hydrohydroxyalkylation of 1,1-disubstituted allenes employing alcohols.
4. Ligand for nickel-catalyzed cross-coupling reaction of arylboronic acids with aryl carbonates.
5. Ligand for palladium-catalyzed regiodivergent hydroesterification of aryl olefins with phenyl formate to form linear structured phenyl arylpropanoates.
6. Ligand for palladium-catalyzed direct borylation of benzyl alcohol and its analogues in the absence of bases.



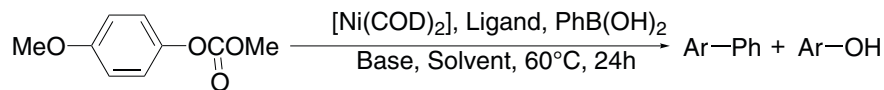
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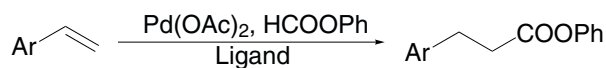
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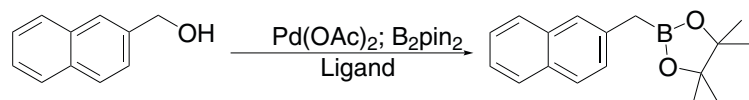
Tech. Note (3)
Ref. (3)



Tech. Note (4)
Ref. (4)



Tech. Note (5)
Ref. (5)



Tech. Note (6)
Ref. (6)

References:

1. *J. Org. Chem.*, **2001**, 66, 3402.
2. *J. Organometal. Chem.*, **2002**, 641, 30.
3. *J. Am. Chem. Soc.*, **2011**, 133, 1141.
4. *Chem. Lett.*, **2011**, 40, 913.
5. *Org. Chem. Front.*, **2015**, 2, 1505.
6. *Org. Lett.*, **2015**, 17, 3544.

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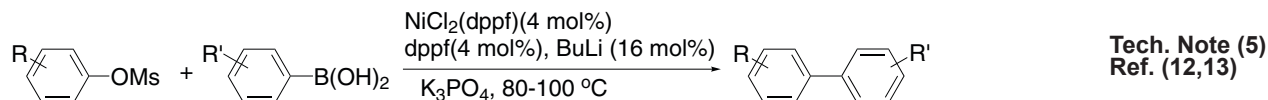
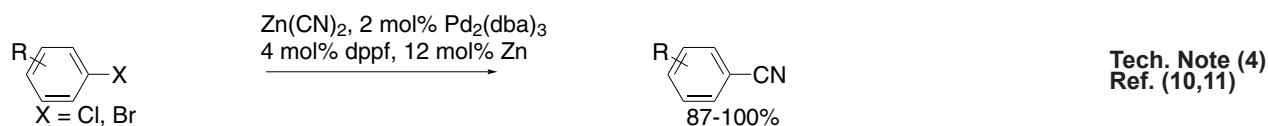
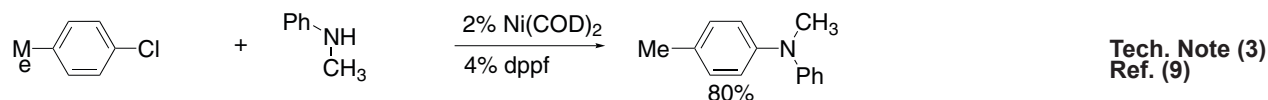
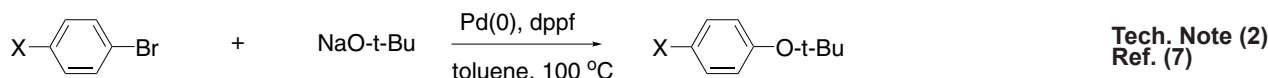
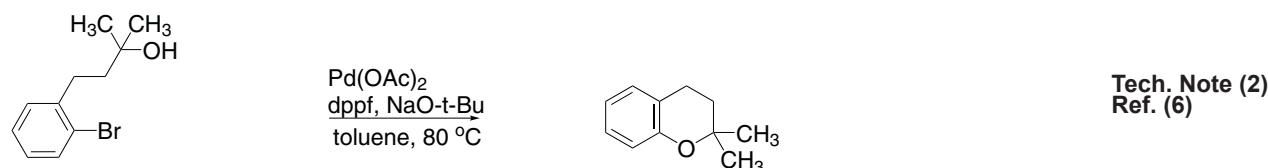
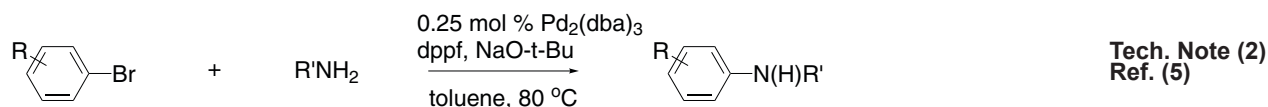
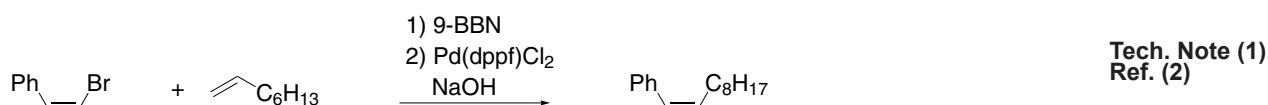
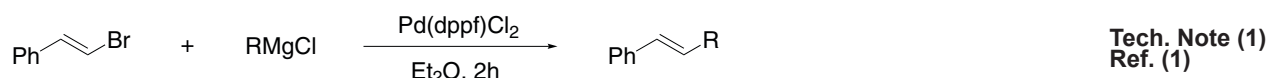
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1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit Components

26-0270 1,1'-Bis(diphenylphosphino)ferrocene, 99% DPPF (12150-46-8) 1g
5g
25g
250g
 $(C_6H_5)_2PC_5H_4FeC_5H_4P(C_6H_5)_2$; FW: 554.39; yellow to orange xtl.; m.p. 180°
 Note: Phosphine Ligand Kit component.

Technical Notes:

1. Ligand for Pd-catalyzed cross-coupling.
2. Useful ligand for Pd-catalyzed carbon-nitrogen and carbon-oxygen bond forming procedures.
3. Ligand for Ni-catalyzed amination of aryl chlorides.
4. Ligand for Pd-catalyzed conversion of aryl halides to aryl nitriles.
5. Ligand for Ni-catalyzed Suzuki reactions.
6. Ni-catalyzed hydroamination of 1,3-dienes.
7. Pd-catalyzed hydrocarbonation and hydroamination of 3,3-dihexylcyclopropene.
8. Pd-catalyzed γ -arylation of β,γ -unsaturated ketones.
9. Ligand for Ru-catalyzed reduction of nitriles to primary amines.
10. Ligand for Rh-catalyzed alkyne head-to-tail dimerization.
11. Ligand for Rh-catalyzed cross-coupling (Ref. 21).
12. Ligand for Rh-catalyzed olefin isomerization (Ref. 22).
13. Ligand for Ni or Rh-catalyzed borylation (Ref. 23, 24)
14. Ligand for regioselective Pd-catalyzed hydrophosphinylation of terminal alkynes to form branched alkenes.



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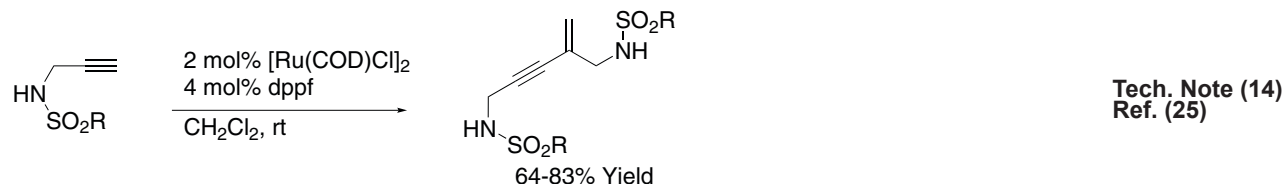
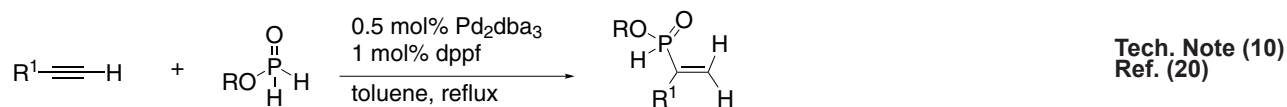
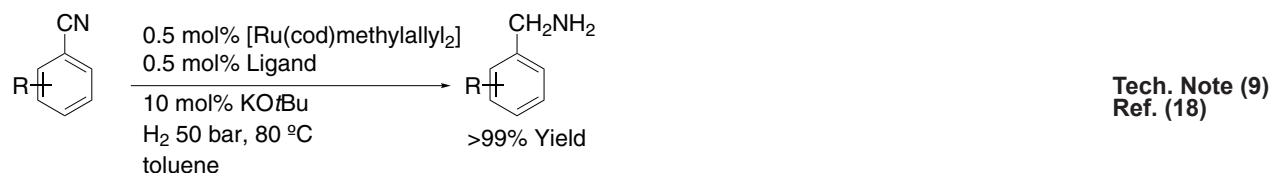
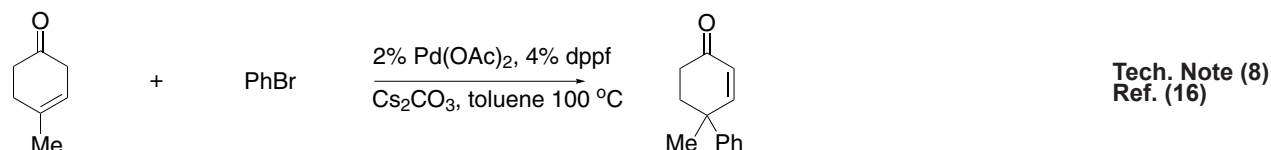
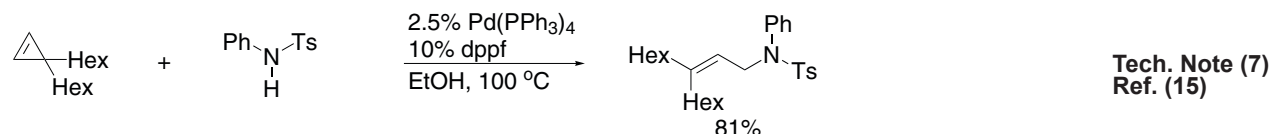
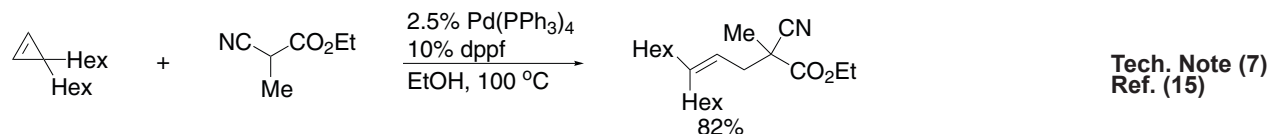
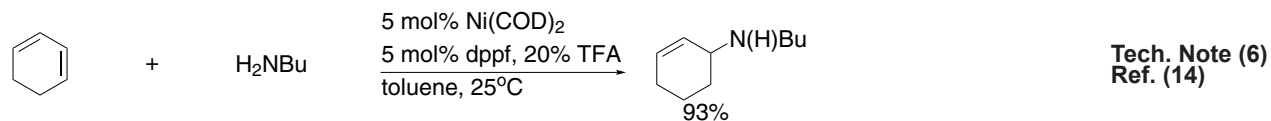
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1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit Components



References:

1. *Pure Appl. Chem.*, **1980**, 52, 669.
2. *J. Am. Chem. Soc.*, **1989**, 111, 314.
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6. *J. Am. Chem. Soc.*, **1996**, 118, 10333.
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8. *Encyclopedia of Reagents for Organic Synthesis*, **1995**, Vol. 1, 518.
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12. *Tetrahedron Lett.*, **1998**, 54, 13079.
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19. *Dalton T.*, **2009**, 36, 4926.
20. *Anv. Synth. Catal.*, **2009**, 9, 1371.
21. *J. Org. Chem.*, **2009**, 74, 2794.
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23. *J. Am. Chem. Soc.*, **2012**, 134, 115.
24. *J. Am. Chem. Soc.*, **2010**, 132, 1800.
25. *J. Organomet. Chem.*, **2011**, 1, 106.

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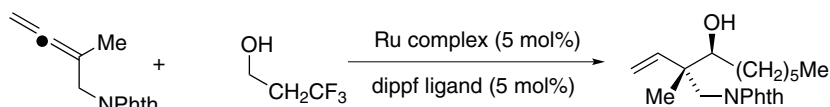
1,1'-Bis(dialkyl/diarylphosphino)ferrocene Ligand Kit Components

26-0275 1,1'-Bis(di-i-propylphosphino)ferrocene, min. 98% DiPPF (97239-80-0)
 $[(C_3H_7)_2PC_5H_4]_2Fe$; FW: 418.33; orange-yellow powdr.

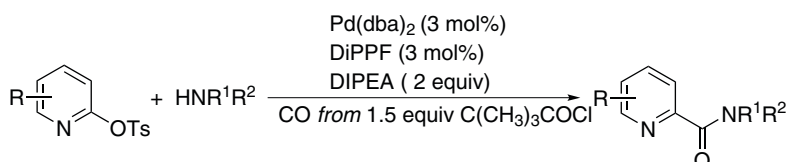
500mg
2g
10g

Technical Notes:

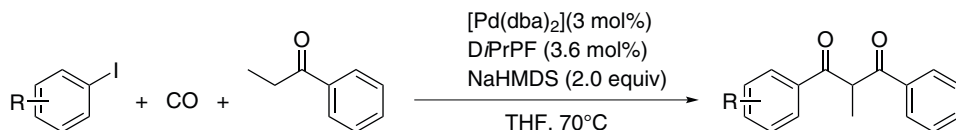
1. Ruthenium- catalyzed hydrohydroxyalkylation of 1,1-disubstituted allenes
2. Ligand for palladium-catalyzed aminocarbonylation of Pyridyl Tosylates by means of ex situ generation of CO.
3. Pd-catalyzed carbonylative α -arylation of ketones with aryl iodides
4. Ligand for palladium-catalyzed alkoxy carbonylation of aryl bromides for the preparation of tertiary esters
5. Ligand for stereoselective palladium-catalyzed decarboxylative allylation β -C-glycosylation
6. Ligand for ruthenium-catalyzed C—C coupling reactions of fluorinated alcohols with allenes.
7. Ligand for cobalt-catalyzed intermolecular formal hydroacylation reaction of olefins using N-3-picolin-2-yl aldimines as aldehyde equivalents.



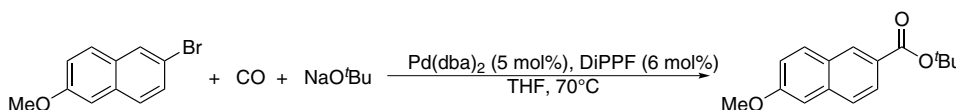
Tech. Note (1)
Ref. (2)



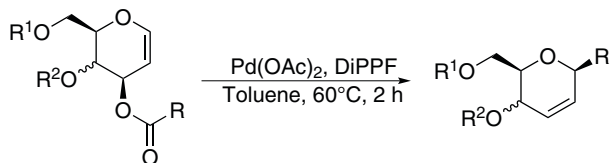
Tech. Note (2)
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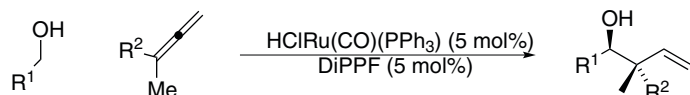
Tech. Note (2)
Ref. (3)



Tech. Note (2)
Ref. (4)

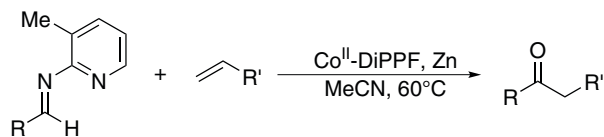


Tech. Note (3)
Ref. (5)



Tech. Note (6)
Ref. (6)

$R^1 = CH_2F, CH_2CF_3, (CH_2)_2CF_3, HC=CHCF_3$
 $R^2 = Ph, CH_2NPhth, 4-MeOC_6H_4, 3,5-Cl_2C_6H_3$



Tech. Note (7)
Ref. (7)

References:

1. *J. Am. Chem. Soc.* **2011**, 133, 1141
2. *J. Am. Chem. Soc.* **2011**, 133, 6061
3. *Angew. Chem. Int. Ed.* **2012**, 51, 798
4. *Org. Lett.*, **2012**, 14, 284
5. *Angew. Chem. Int. Ed.* **2013**, 52, 5134
6. *Angew. Chem. Int. Ed.* **2015**, 54, 5465
7. *ACS Catal.* **2015**, 5, 3054

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1,1'-Bis(dialkyl/diarylphosphino)ferrocene Catalyst Kit Components

46-0445	Dichloro[1,1'-bis(di-<i>t</i>-butylphosphino) ferrocene]palladium(II), 99% (95408-45-0) [[C ₅ H ₄ P(C ₄ H ₉) ₂] ₂ Fe]PdCl ₂ ; FW: 651.75; brown to purple xtl	100mg 500mg 2g 10g
46-0455	Dichloro[1,1'-bis(dicyclohexylphosphino)ferrocene]palladium(II), dichloromethane adduct, 99% (917511-90-1) [[C ₅ H ₄ P(C ₆ H ₁₁) ₂] ₂ Fe]PdCl ₂ ; FW: 755.89; red-orange microxtl.	250mg 1g

Technical Note:

- Air-stable catalyst useful in the arylation of various ketones with aryl chlorides and aryl bromides.

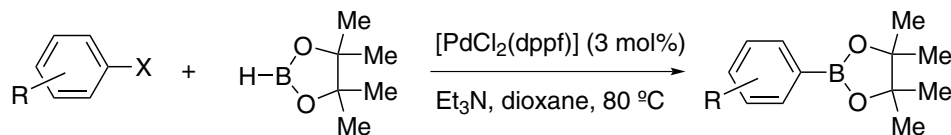
References:

- Org. Proc. Res. Dev.*, **2008**, *12*, 522

46-0450	Dichloro 1,1'-bis(diphenylphosphino)ferrocene palladium (II) dichloromethane, 99% (95464-05-4) [[C ₅ H ₄ P(C ₆ H ₅) ₂] ₂ Fe]PdCl ₂ ·CH ₂ Cl ₂ ; FW: 731.77 (816.65); orange-red powdr.	1g 5g 25g
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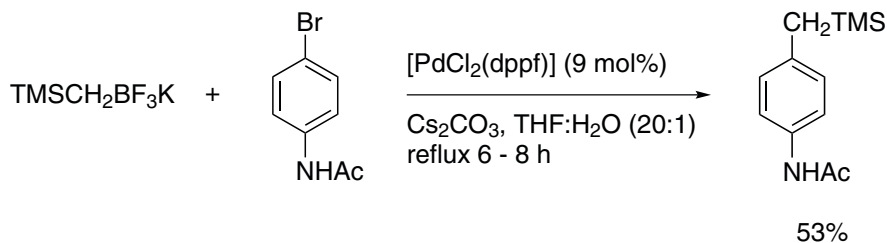
Technical Notes:

- See 26-0270.
- Catalyst for the borylation of aryl halides.
- β-Alkyl Suzuki-Miyaura cross-coupling reactions with potassium alkyltrifluoroborates.
- Catalyst for modified Negishi coupling.
- Synthesis of polyheterocycles by a Pd-catalyzed intramolecular N-arylation/C-H bond activation/aryl-aryl bond-forming domino process.
- Catalyst for Stille allylation.
- Catalyst for the amination of aryl bromides.

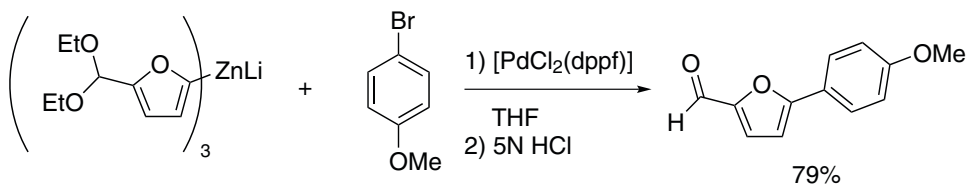


Tech. Note (2)
Ref. (1)

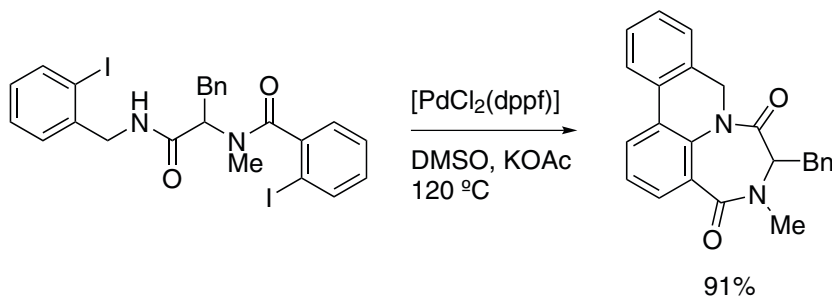
X=Br, I, OTf, ONF



Tech. Note (3)
Ref. (2)



Tech. Note (4)
Ref. (3)



Tech. Note (5)
Ref. (4)

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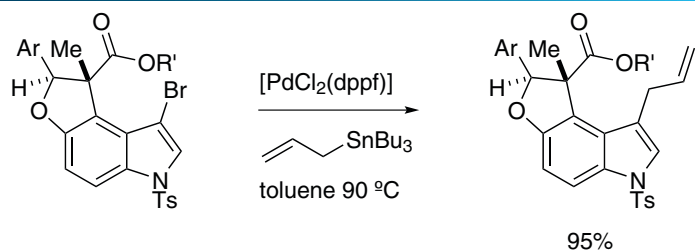
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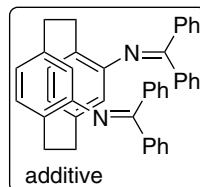
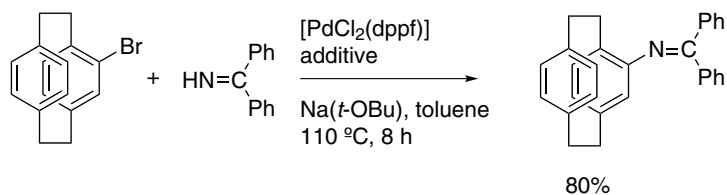
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Tech. Note (6)
Ref. (5)



Tech. Note (7)
Ref. (6)

References:

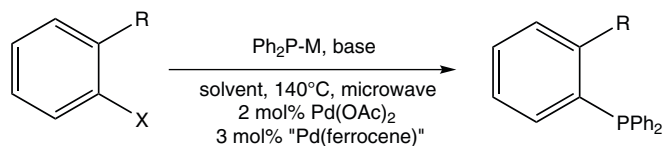
1. *J. Org. Chem.*, **2000**, 65, 164
2. *J. Org. Chem.*, **2003**, 74, 5534
3. *Org. Lett.*, **2002**, 4, 375
4. *Angew. Chem. Int. Ed.*, **2003**, 42, 4774
5. *J. Am. Chem. Soc.*, **2008**, 130, 16854
6. *J. Org. Chem.*, **2009**, 74, 6867

46-0460 Dichloro[1,1'-bis(di-*i*-propylphosphino)ferrocene]palladium(II), 99% (215788-65-1)
 $[(C_5H_4P(C_3H_7)_2)_2Fe]PdCl_2$; FW: 595.64; yellow-orange solid

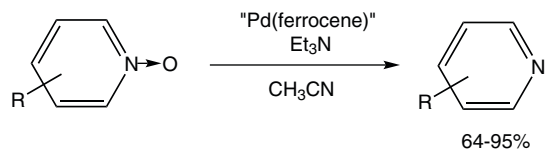
500mg
2g

Technical Notes:

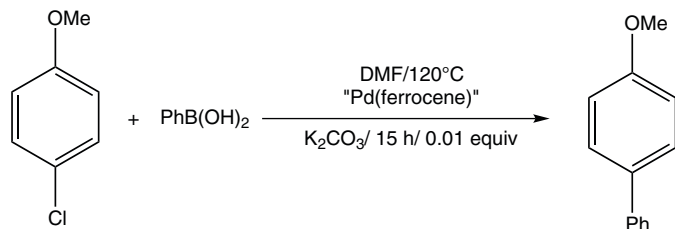
1. Palladium-catalyzed P-C bond formation between diphenylphosphine and ortho-substituted aryl bromides.
2. Deoxygenation of pyridine N-oxides by palladium-catalyzed oxidation of trialkylamines
3. Air-stable catalyst useful in challenging Suzuki coupling reactions.



Tech. Note (1)
Ref. (1)



Tech. Note (2)
Ref. (2)



Tech. Note (3)
Ref. (3)

References:

1. *Appl. Organomet. Chem.*, **2009**, 23, 272.
2. *Synlett.*, **2008**, 2579.
3. *Org. Lett.*, **2004**, 6, 3731.

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