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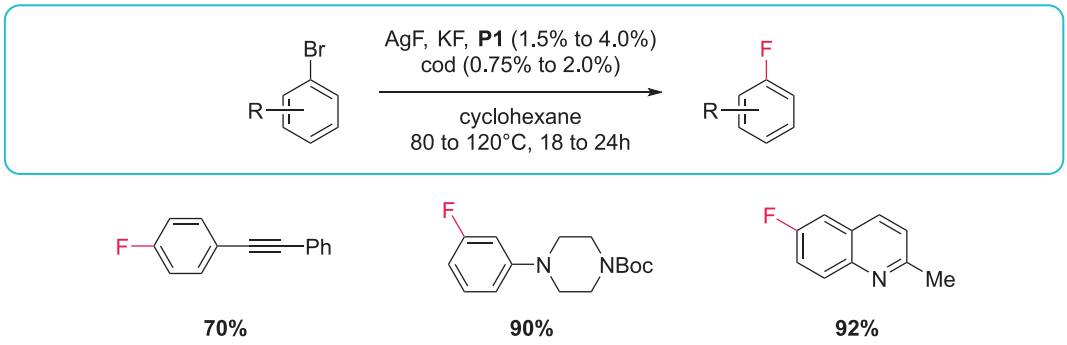
Data Sheet

Buchwald G6 Precatalysts: Oxidative Addition Complexes for Efficient L–Pd(0) Generation

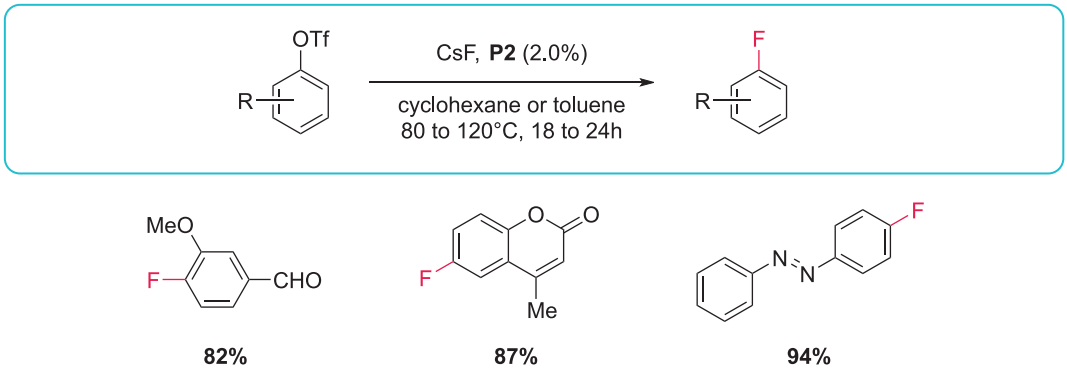
Buchwald G6 precatalysts and other OACs have been applied as effective catalysts for the formation of C–C, C–N, C–O, C–F, and C–S bonds.[1–5] For the following reactions and applications, see **Table 2** for referenced Buchwald G6 and other OAC precatalysts.

Table 1. Reactions and Applications

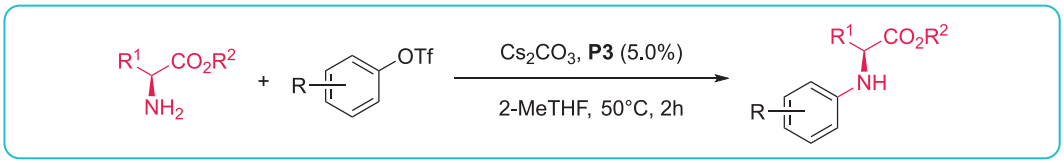
Fluorination of Aryl Bromides[1]

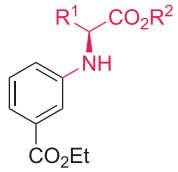


Fluorination of Aryl Triflates[1]

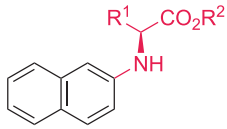


Amino Acid Ester Arylation[1]

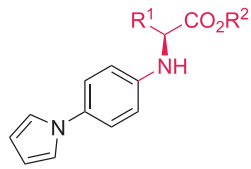




75%
94% ee

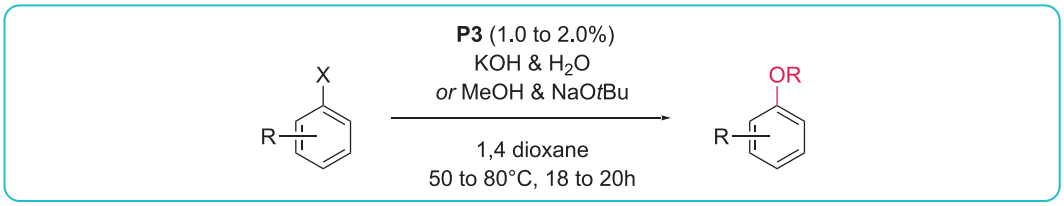


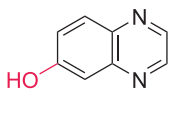
86%
97% ee



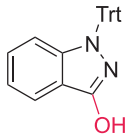
85%
98% ee

Alcohol and Hydroxide Coupling[1]

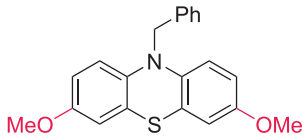




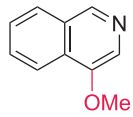
90%



71%

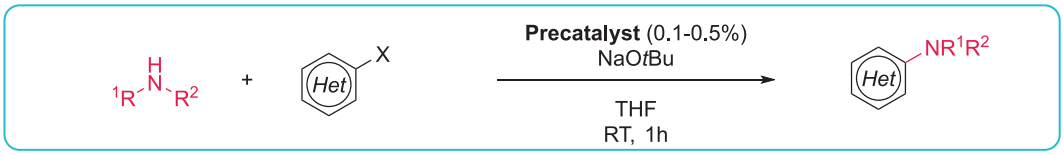


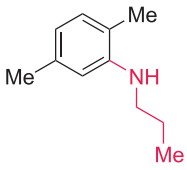
84%



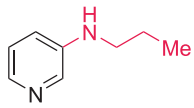
92%

Buchwald Hartwig Aminations with Primary Aliphatic Amines[2]

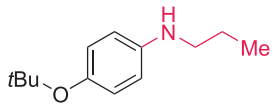




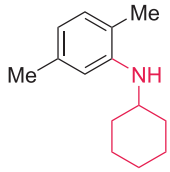
X = Br
P5: 69%
P11: 0%



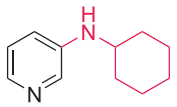
X = Cl
P5: >95%
P11: >90%



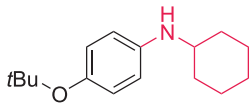
X = Cl
P5: 79%
P11: 81%



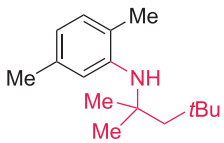
X = Br
P5: 60%
P11: 6%



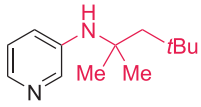
X = Cl
P5: 46%
P11: 46%



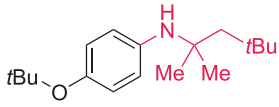
X = Cl
P5: 34%
P11: 39%



X = Br
P5: 17%
P11: 2%

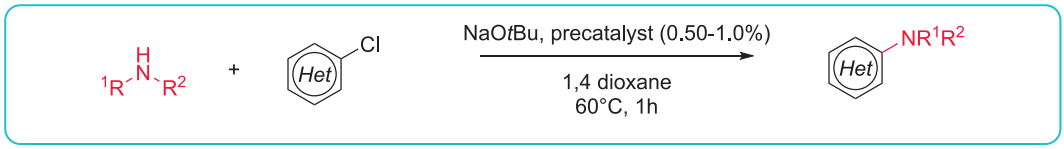


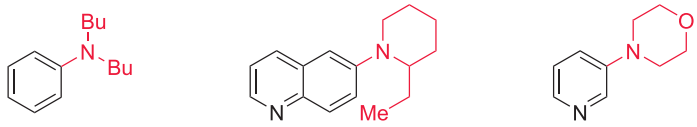
X = Cl
P5: 23%
P11: 15%



X = Cl
P5: 87%
P11: 34%

Buchwald Hartwig Amination with Alkyl Amines and N Heterocycles[3]



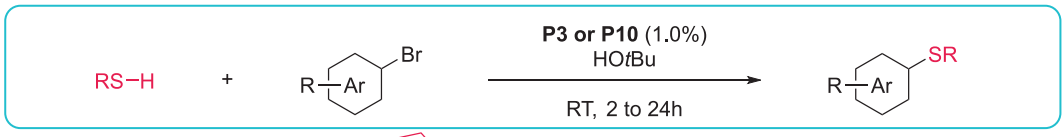


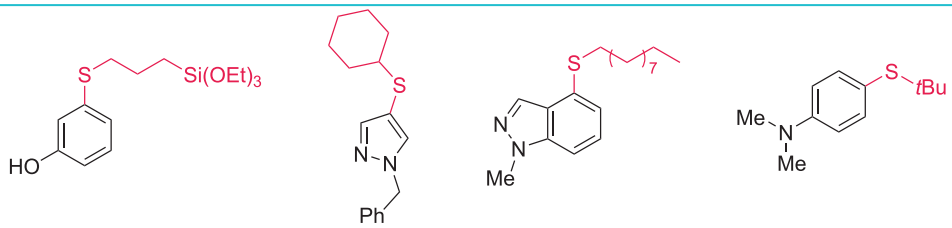
P5: 1%
P12: 10%
P14: 55%
P15: 71%

P5: 24%
P12: 0%
P14 57%
P15: 100%

P5: 21%
P12: 7%
P14 :95%
P15: 73%

Aliphatic Thiol Coupling of Hetero(aryl) Bromides[4]





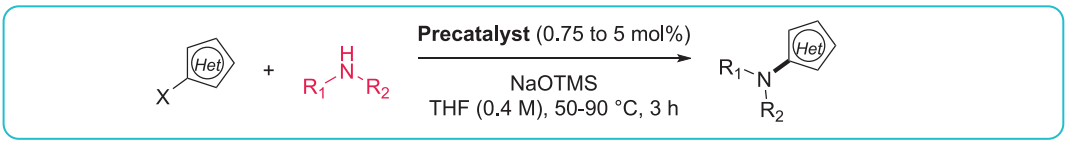
P3: 98%

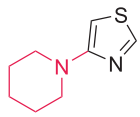
P3: 96%

P10: 97%

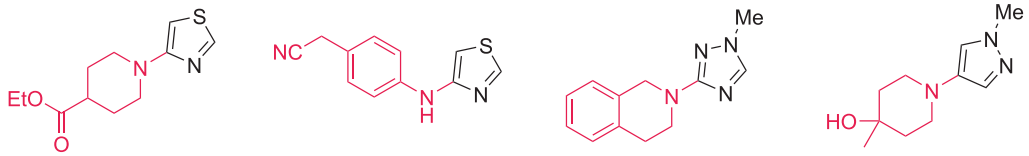
P10: 99%

Buchwald-Hartwig Amination of Base-Sensitive Five-Membered Heteroaryl Halides and Aliphatic Amines[5]





X = Br
P4: 58%
P5: 91%
P6: 16%
P11: 53%
P12: 0%

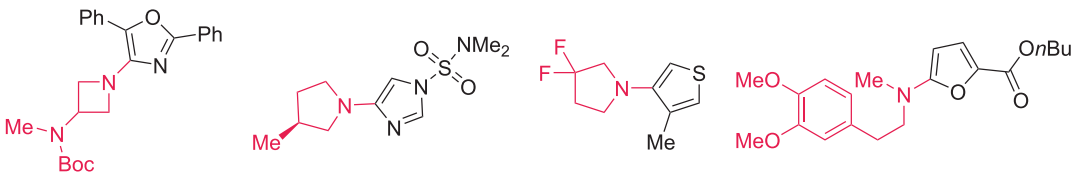


X = Br
P5: 88%

X = Cl
P5: 90%

X = Br
P5: 99%

X = Br
P5: 98%



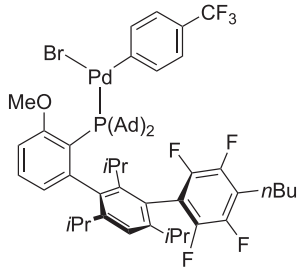
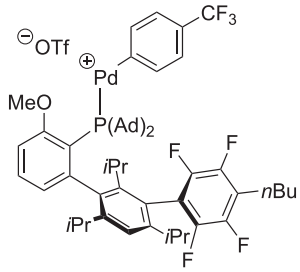
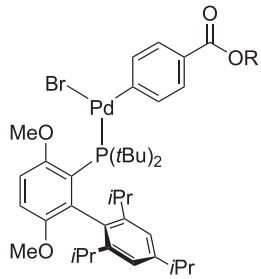
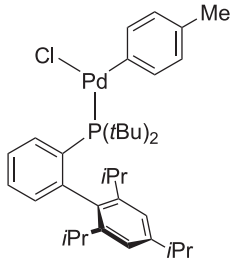
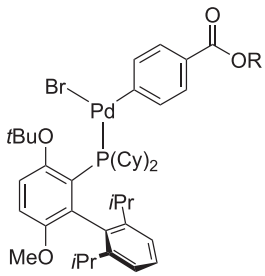
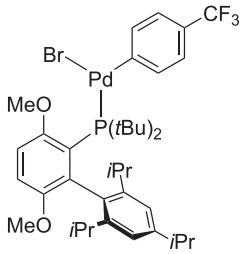
X = Br
P5: 82%

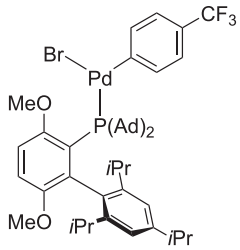
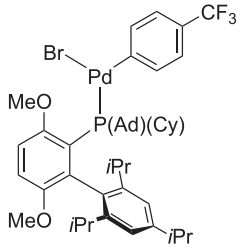
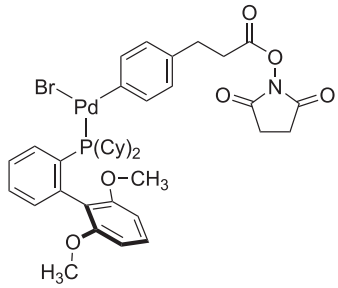
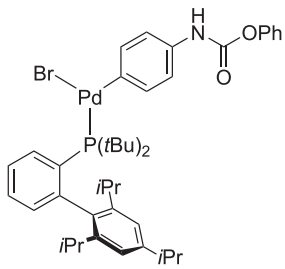
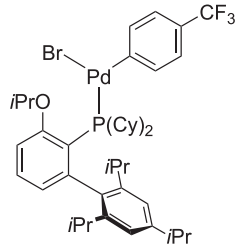
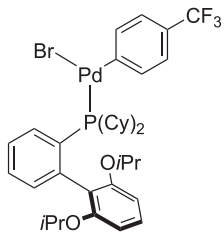
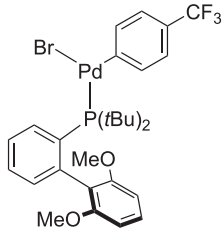
X = I
P5: 94%

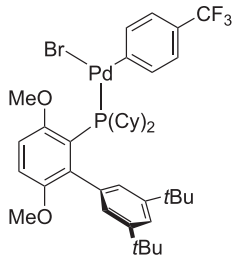
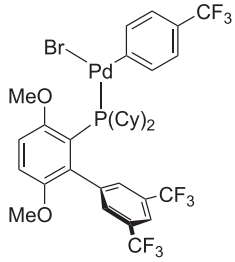
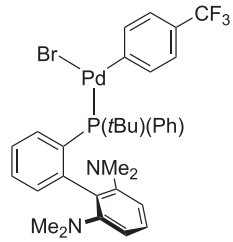
X = Br
P5: 90%

X =Br
P5: 84%

Table 2. Buchwald G6 and Other OAC Precatalysts.

Precatalyst Reference ID	Product Number	Name	Structure
P1	**915602**	(AlPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	
P2	**916455**	(AlPhos)Pd(*p*-$CF_3C_6H_4$)(OTf)	
P3	**912883**	(*t*BuBrettPhos)Pd(*p*-$TMSCH_2CH_2CO_2C_6H_4$)(Br)	 R = CH_2CH_2TMS
P4	**937398**	(*t*BuXPhos)Pd(*p*-MeC_6H_4)(Cl)	
P5	**922900**	(GPhos)Pd(*p*-$TMSCH_2CH_2CO_2C_6H_4$)(Br)	 R = CH_2CH_2TMS
P6	**912646**	(*t*BuBrettPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	

Precatalyst Reference ID	Product Number	Name	Structure
P7	915378	(AdBrettPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	
P8	925454	(AdCyBrettPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	
P9	931853	(SPhos)Pd(*p*-$C_4H_4NO_2CO_2CH_2CH_2C_6H_4$)(Br)	
P10	936103	(*t*BuXPhos)Pd(*p*-$C_6H_5OC(O)NHC_6H_4$)(Br)	
P11	938734	(EPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	
P12	938742	(RuPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	
P13	944319	(*t*BuSPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	

Precatalyst Reference ID	Product Number	Name	Structure
P14	**945625***	(3,5-*t*Bu-CyFPhos)Pd(*p*-$CF_3C_6H_4$)(Br)	
P15	**946230***	CyFPhos Pd(*p*-$CF_3C_6H_4$)(Br)	
P16	**937452***	((*t*Bu)PhCPhos)Pd(p-$CF_3C_6H_4$)(Br)	

*Coming Soon

Reference

1. Ingoglia BT, Buchwald SL. 2017. Oxidative Addition Complexes as Precatalysts for Cross-Coupling Reactions Requiring Extremely Bulky Biarylphosphine Ligands. Org. Lett.. 19(11):2853-2856. **https://doi.org/10.1021/acs.orglett.7b01082**
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3. Feng K, Reichert E, Raguram J, Howard JR, Peters E, Liu C, Sigman MS, Buchwald SL. 2024. Development of a Deactivation-Resistant Dialkylbiarylphosphine Ligand for Pd-Catalyzed Arylation of Secondary Amines. J. Am. Chem. Soc.. 146(39):26609–26615. **https://doi.org/10.1021/jacs.4c09667**
4. Xu J, Liu RY, Yeung CS, Buchwald SL. 2019. Monophosphine Ligands Promote Pd-Catalyzed C-S Cross-Coupling Reactions at Room Temperature with Soluble Bases. ACS Catal.. 9(7):6461-6466. **https://doi.org/10.1021/acscatal.9b01913**
5. Reichert EC, Feng K, Sather AC, Buchwald SL. 2023. Pd-Catalyzed Amination of Base-Sensitive Five-Membered Heteroaryl Halides with Aliphatic Amines. J. Am. Chem. Soc.. 145(6):3323-3329. **https://doi.org/10.1021/jacs.2c13520**

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