TABLE 1. CROSS-COUPLINGS OF ALKYLBORON REAGENTS WITH ALKYL ELECTROPHILES

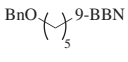
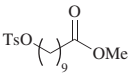
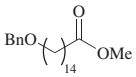
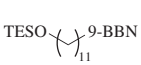
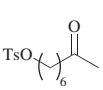
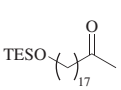
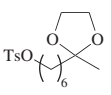
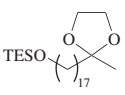
Alkylboron Reagent	Alkyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_5				
 1.2 eq		$Pd(OAc)_2$ (4 mol %), $P(t\text{-}Bu)_2Me$ (16 mol %), NaOH (1.2 eq), dioxane, 50°, 48 h	 (60)	61
C_6				
$n\text{-}C_6H_{13}$—9-BBN 1.2 eq		$Pd(OAc)_2$ (4 mol %), **L1** (5 mol %), $K_3PO_4 \bullet H_2O$ (1.2 eq), THF, rt, 24 h	$n\text{-}C_{12}H_{25}$—CN (62)	185
1.2 eq	Br—$n\text{-}C_{12}H_{25}$	$Pd(OAc)_2$ (4 mol %), **L1** (5 mol %), $K_3PO_4 \bullet H_2O$ (1.2 eq), THF, rt, 24 h	$n\text{-}C_{18}H_{38}$ (93)	185
$n\text{-}C_6H_{13}$—$B(OH)_2$ 1.5 eq	Br—$n\text{-}C_{12}H_{25}$	$Pd(OAc)_2$ (5 mol %), $P(t\text{-}Bu)_2Me$ (10 mol %), KO*t*-Bu (3 eq), *t*-amyl alcohol, rt, 24 h	$n\text{-}C_{18}H_{38}$ (66)	186
C_{11}				
 1.2 eq		$Pd(OAc)_2$ (4 mol %), $P(t\text{-}Bu)_2Me$ (16 mol %), NaOH (1.2 eq), dioxane, 50°, 48 h	 (55)	61
1.2 eq		$Pd(OAc)_2$ (4 mol %), $P(t\text{-}Bu)_2Me$ (16 mol %), NaOH (1.2 eq), dioxane, 50°, 46 h	 (67)	61

TABLE 2. CROSS-COUPLINGS OF ALKYLBORON REAGENTS WITH ALKENYL ELECTROPHILES

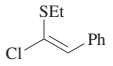
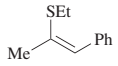
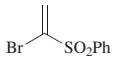
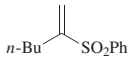
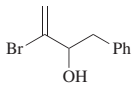
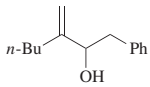
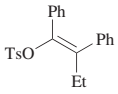
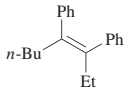
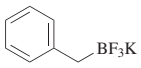
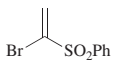
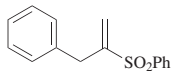
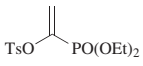
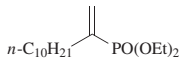
Alkylboron Reagent	Alkenyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_1				
$Me-B(OH)_2$ 1.3 eq		$Pd(OAc)_2$ (5 mol %), PPh_3 (10 mol %), Cs_2CO_3 (1.5 eq), THF, 40°, 5 h	 (66)	187
C_4				
n-Bu—BF_3K 1.5 eq		$Pd(OAc)_2$ (5 mol %), SPhos (10 mol %), Cs_2CO_3 (2 eq), toluene/water (4:1), 50°, 15 h	 (71)	188
n-Bu—$B(OH)_2$ 1.5 eq		$Pd(OAc)_2$ (5 mol %), LB-Phos•HBF_4 (5 mol %), K_2CO_3 (4.5 eq), toluene, 110°, 5.7 h	 (80)	189
1.1 eq	 $(E)/(Z)$ = 100:0	$Pd(OAc)_2$ (1 mol %), RuPhos (2 mol %), K_3PO_4•H_2O (1.5 eq), toluene/water (3:1), 70°, 24 h	 (98) $(E)/(Z)$ = 99:1	122
C_7				
 1.5 eq		$Pd(OAc)_2$ (5 mol %), SPhos (10 mol %), Cs_2CO_3 (2 eq), toluene/water (4:1), 50°, 15 h	 (60)	188
C_{10}				
n-$C_{10}H_{21}$—BF_3K 2 eq		$Pd(OAc)_2$ (7 mol %), SPhos (15 mol %), Cs_2CO_3 (2.5 eq), toluene/water (4:1), 60°, 20 h	 (99)	190

TABLE 3. CROSS-COUPLINGS OF ALKYLBORON REAGENTS WITH ARYL ELECTROPHILES

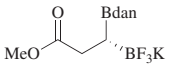
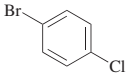
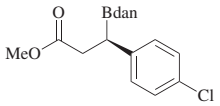
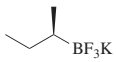
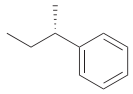
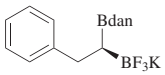
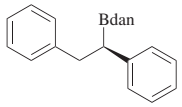
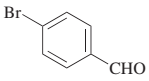
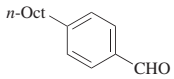
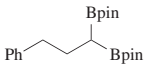
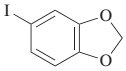
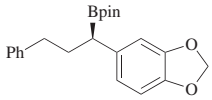
Alkylboron Reagent	Aryl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_2				
BEt_3 0.4 eq		$Pd(OAc)_2$ (2.5 mol %), (*n*-Bu)Ad_2P (5 mol %), K_3PO_4 (2 eq), toluene/water (10:1), 100°	 (90)	191
C_3				
 er 99.5:0.5 1.2 eq		$Pd(OAc)_2$ (10 mol %), XPhos (20 mol %), K_2CO_3 (3 eq), toluene/water (10:1), 80°, 6 h	 (85) er 99.5:0.5	68
C_4				
 er 99.0:1.0 1.5 eq		**Cat1** (10 mol %), K_2CO_3 (3 eq), toluene/water (2:1), 100°, 24 h	 (93) er 98.0:2.0	65
C_8				
 er 97.0:3.0 1.5 eq		$Pd(OAc)_2$ (10 mol %), XPhos (20 mol %), K_2CO_3 (3 eq), toluene/water (10:1), 80°, 6 h	 (15) er 90.5:9.5	69
n-Oct—$B(OH)_2$ 2 eq		**L2**[$PdCl(C_3H_5)$] (0.01 mol %), K_2CO_3 (2 eq), xylene, 130°, 20 h	 (74)	192
C_9				
 1.1 eq		$Pd(OAc)_2$ (5 mol %), **L3** (10 mol %), KOH (15 eq), dioxane/water (1:1), rt, 12 h	 (88) er 92.0:8.0	67

TABLE 4. CROSS-COUPLINGS OF ALKENYLBORON REAGENTS WITH ALKENYL ELECTROPHILES

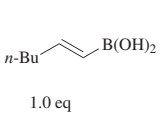
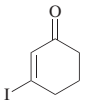
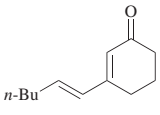
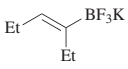
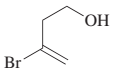
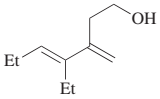
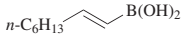
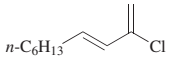
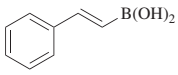
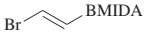
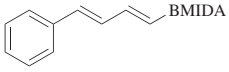
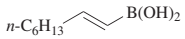
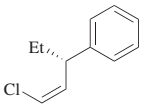
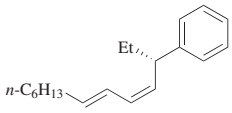
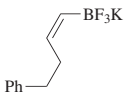
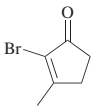
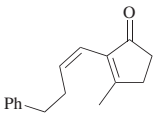
Alkenylboron Reagent	Alkenyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_6				
 1.0 eq		$Pd(OAc)_2$ (2.5 mol %), TPPTS (5 mol %), *i*-Pr_2NH (2.5 eq), MeCN/water (3:1), rt	 (95)	193
 1.1 eq		$Pd(OAc)_2$ (5 mol %), PPh_3 (10 mol %), Cs_2CO_3 (3 eq), THF/water (10:1), 70°, 2 h	 (66)	194
C_8				
	 4 eq	$Pd_2(dba)_3$ (0.5 mol %), XPhos (2 mol %), K_3PO_4 (2 eq), toluene, 100°, 4 h	 (92)	195
 1.5 eq		$Pd(OAc)_2$ (2.5 mol %), SPhos (5 mol %), KF (2 eq), toluene, rt, 24 h	 (92)	196
 1.5 eq	 pure (*Z*) isomer er 98.0:2.0	$Pd_2(dba)_3$ (5 mol %), XPhos (10 mol %), CsF (3 eq), dioxane, 100°, 16 h	 (*Z*)/(*E*) > 99:1 er 98.0:2.0 (77)	197
C_{10}				
 1.1 eq		$Pd(OAc)_2$ (5 mol %), PPh_3 (10 mol %), Cs_2CO_3 (3 eq), THF/water (10:1), 70°, 12 h	 (95)	194

TABLE 5. CROSS-COUPLINGS OF ALKENYLBORON REAGENTS WITH ARYL ELECTROPHILES

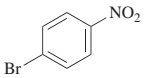
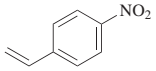
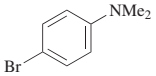
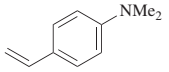
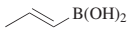
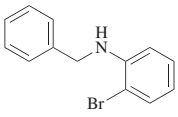
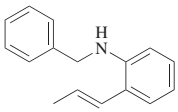
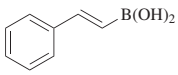
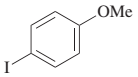
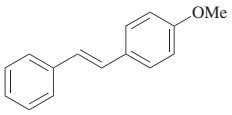
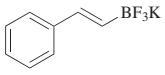
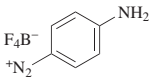
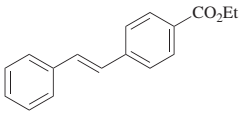
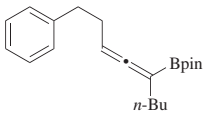
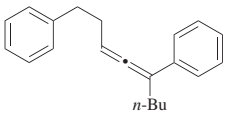
Alkenylboron Reagent	Aryl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_2				
 1.1 eq		5% Pd/C (2 mol %), $NaOAc•3H_2O$ (3 eq), NMP, 100°, 24 h	 (78)	198
1.05 eq		$PdCl_2$ (2 mol %), RuPhos (6 mol %), Cs_2CO_3 (3 eq), THF/water (9:1), 85°, 22 h	 (93)	131
C_3				
 1.25 eq		$Pd(PPh_3)_4$ (5 mol %), Na_2CO_3 (1 eq), DME/water (4:1), reflux, 20 h	 (92)	199
C_8				
 1.5 eq		**Cat3** (0.001 mol %), K_2CO_3 (3 eq), dioxane, 80°, 8 h	 (92)	200
 1.2 eq		$Pd_2(OAc)_2(P(2\text{-}Tol)_3)_2$ (5 mol %), MeOH, 20°, 2 min	 (96)	144
C_{15}				
		$PdCl_2(PPh_3)_2$ (5 mol %), CuCl (2 mol %), Na_2CO_3 (2 eq), MeOH/toluene (4:1), rt, 16 h	 (18)	201

TABLE 6. CROSS-COUPLINGS OF ALKENYLBORON REAGENTS WITH ALKYNYL ELECTROPHILES

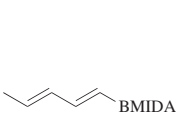
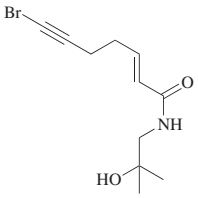
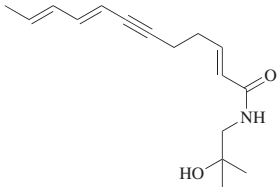
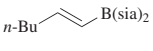
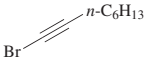
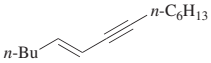
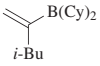
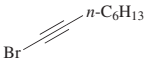
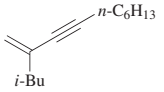
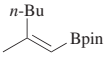
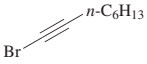
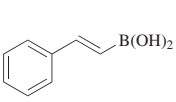
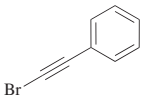
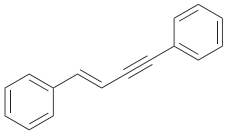
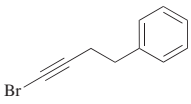
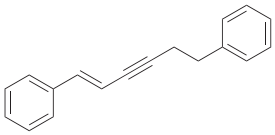
Alkenylboron Reagent	Alkynyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_5  1.4 eq		$Pd(OAc)_2$ (10 mol %), SPhos (20 mol %), NaOH (7.2 eq), THF/water (2:1), 30°, 2 h	 (54)	99
C_6  1.1 eq		$Pd(PPh_3)_4$ (1 mol %), NaOMe (2.2 eq), benzene/methanol (2:1), 80°, 2 h	 (100)	1
 1.13 eq		$Pd(PPh_3)_4$ (6 mol %), NaOH (4.7 eq), THF/water (8:3), reflux, 12 h	 (56)	130
C_7  1.2 eq		$PdCl_2$(DPEPhos) (1 mol %), (n-Bu)$_4$NF (2 eq), THF, 60°, 12 h	 (93)	202
C_8  1.2 eq		$Pd(dba)_2$ (0.1 mol %), Cs_2CO_3 (2 eq), MeOH, rt, 12 h	 (67)	203
 1.5 eq		$Pd(PPh_3)_4$ (5 mol %), KOH (6 eq), dioxane/water (5:1), 90°, 14 h	 (84)	204

TABLE 7. CROSS-COUPLINGS OF ARYLBORON REAGENTS WITH ALKYL ELECTROPHILES

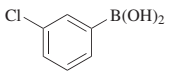
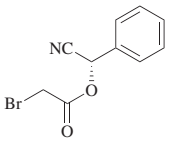
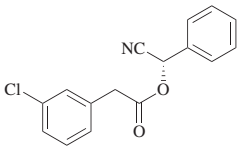
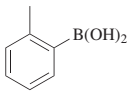
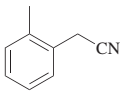
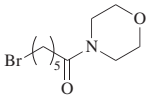
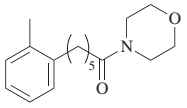
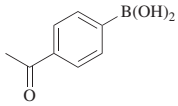
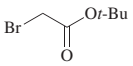
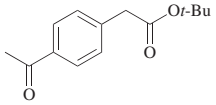
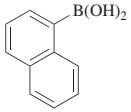
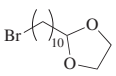
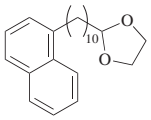
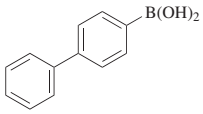
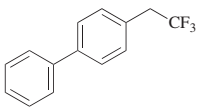
Arylboron Reagent	Alkyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_6				
 1.5 eq		$Pd(OAc)_2$ (3 mol %), $P(2\text{-Tol})_3$ (9 mol %), KF (3 eq), toluene, 60°, 1.5 h	 (73) er 99.5:0.5	205
C_7				
 1.5 eq		$Pd(OAc)_2$ (2.5 mol %), SPhos (5 mol %), Na_2CO_3 (1.5 eq), dioxane/water (10:1), 60°, 12 h	 (89)	206
1.5 eq		$Pd(OAc)_2$ (5 mol %), $(t\text{-Bu})_2MePH^+ BF_4^-$ (10 mol %), KO*t*-Bu (3 eq), *t*-amyl alcohol, rt, 24 h	 (76)	186
C_8				
 1.3 eq		$Pd(OAc)_2$ (3 mol %), $P(2\text{-Tol})_3$ (10 mol %), K_2CO_3 (5.4 eq), THF/water (145:1), rt, 18 h	 (76)	207
C_{10}				
 1.5 eq		$Pd(OAc)_2$ (5 mol %), $P(t\text{-Bu})_2Me$ (10 mol %), KO*t*-Bu (3 eq), *t*-amyl alcohol, rt, 24 h	 (97)	186
C_{12}				
	 2 eq	$Pd_2(dba)_3$ (5 mol %), XantPhos (17 mol %), Cs_2CO_3 (4 eq), dioxane/water (31:1), 80°, 12 h	 (81)	208

TABLE 8. CROSS-COUPLINGS OF ARYLBORON REAGENTS WITH ALKENYL ELECTROPHILES

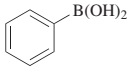
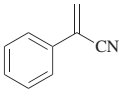
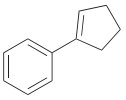
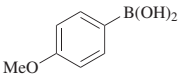
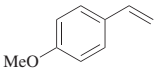
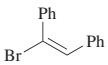
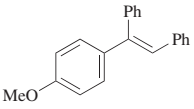
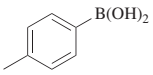
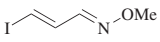
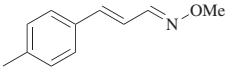
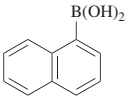
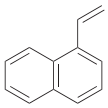
Arylboron Reagent	Alkenyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_6				
	 2 eq	$Pd_2Cl_2(allyl)_2$ (1 mol %), **L2** (2 mol %), K_2CO_3 (2 eq), xylene, 100°, 20 h	 (79)	209
1.2 eq		$Pd(OAc)_2$ (2 mol %), **L4** (4 mol %), KF (1.5 eq), 18-crown-6 (1.5 eq), THF, 50°, 16 h	 (87)	210
 1.5 eq	 Generated from 1,2-dibromoethane and KOH in situ	$Pd(OAc)_2$ (4 mol %), PPh_3 (8 mol %), KOH (3 eq), MeOH/THF (1:1), sealed tube, 100°, 1 h	 (87)	211
1.2 eq		$Pd(OAc)_2$ (0.5 mol %), PPh_3 (1 mol %), KOH (2 eq), MeOH/THF (1:1), 25°, 1 h	 (98)	212
C_7				
	 2 eq	$Pd(PPh_3)_4$ (5 mol %), K_3PO_4 (2 eq), dioxane, 60°, 10 h	 (59)	213
C_{10}				
 1.5 eq	 Generated from 1,2-dibromoethane and KOH in situ	$Pd(OAc)_2$ (2 mol %), PPh_3 (4 mol %), KOH (3 eq), MeOH/THF (1:1), 100°, 1 h	 (87)	209

TABLE 9. CROSS-COUPLINGS OF ARYLBORON REAGENTS WITH ARYL ELECTROPHILES

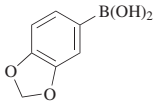
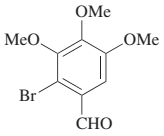
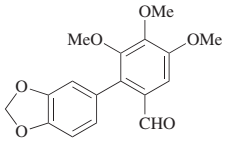
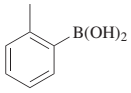
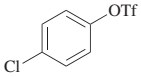
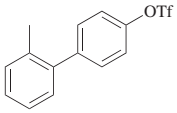
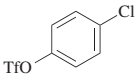
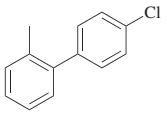
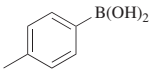
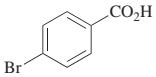
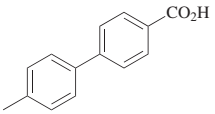
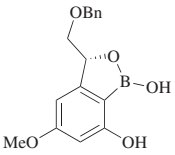
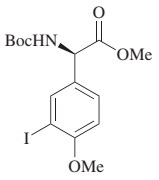
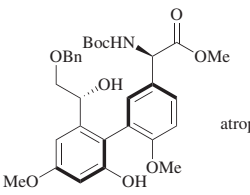
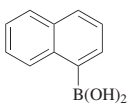
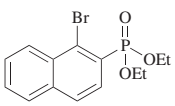
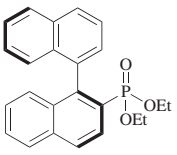
Arylboron Reagent	Aryl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_6				
		$PdCl_2(PPh_3)_2$ (4 mol %), KF (2 eq), toluene/water (10:1)	 (79)	214
C_7				
 1.0 eq		$Pd_2(dba)_3$ (1.5 mol %), P(*t*-Bu)$_3$ (3 mol %), KF (3 eq), THF, rt, 24 h	 (95)	46
1.0 eq		$Pd(OAc)_2$ (3 mol %), PCy_3 (6 mol %), KF (3 eq), THF, rt, 48 h	 (87)	46
 1.3 eq		**Cat2** (0.1 mol %), K_3PO_4 (2 eq), water, 80°, 30 min	 (99)	215
C_8				
		$Pd(PPh_3)_4$ (20 mol %), Na_2CO_3 (1.2 eq), toluene/MeOH/water (20:2:1), 90°, 4 h	 (84) atropisomer dr 67:33	216
C_{10}				
 2 eq		$Pd(OAc)_2$ (5 mol %), **L5** (6 mol %), K_3PO_4 (3 eq), THF, rt, 12 h	 (88) er 95.0:5.0	217

TABLE 10. CROSS-COUPLINGS OF ARYLBORON REAGENTS WITH ALKYNYL ELECTROPHILES

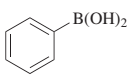
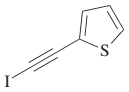
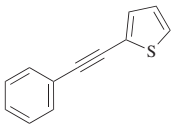
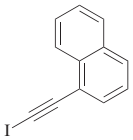
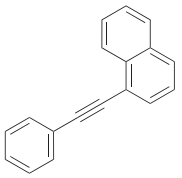
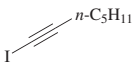
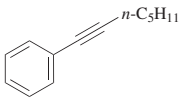
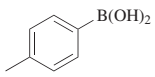
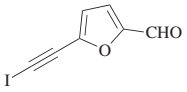
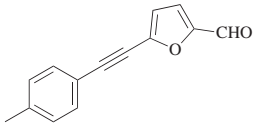
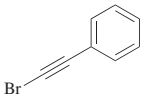
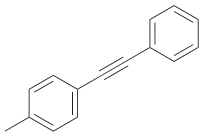
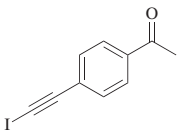
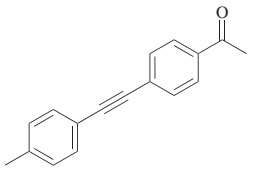
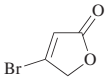
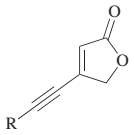
Arylboron Reagent	Alkynyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_6				
 1.2 eq		$Pd(dba)_2$ (0.1 mol %), Cs_2CO_3 (2 eq), MeOH, rt, 12 h	 (95)	203
1.2 eq		$Pd(dba)_2$ (0.1 mol %), Cs_2CO_3 (2 eq), MeOH, rt, 12 h	 (74)	203
1.2 eq		$Pd(dba)_2$ (0.1 mol %), Cs_2CO_3 (2 eq), MeOH, rt, 12 h	 (68)	203
C_7				
 1.5 eq		$PdCl_2$ (1 mol %), K_2CO_3 (2 eq), MeOH/toluene/water (3:3:1), 80°, 8 h	 (86)	218
1.2 eq		$Pd(dba)_2$ (0.1 mol %), Cs_2CO_3 (2 eq), MeOH, rt, 12 h	 (91)	203
1.5 eq		$PdCl_2$ (1 mol %), K_2CO_3 (2 eq), MeOH/toluene/water (3:3:1), 80°, 8 h	 (92)	218

TABLE 11. CROSS-COUPLINGS OF ALKYNYLBORON REAGENTS WITH ALKENYL ELECTROPHILES

Alkynylboron Reagent	Alkenyl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_{2-9} 		$Pd(dppf)Cl_2•CH_2Cl_2$ (5 mol %), THF, rt		219

R	Time (h)	
$(Me)_3Si$	4	(71)
$Cl(CH_2)_3$	3	(89)
t-Bu	3	(95)
isopropenyl	3	(88)
n-Bu	4	(95)
1-cyclohexenyl	5	(80)
Ph	6	(91)
$4\text{-}MeC_6H_4$	6	(87)

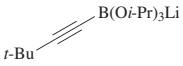
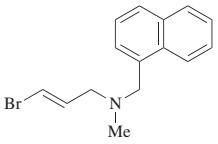
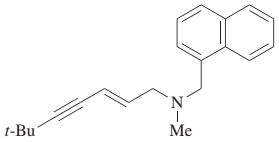
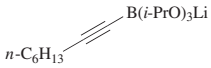
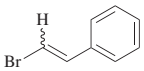
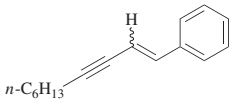
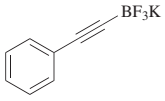
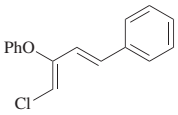
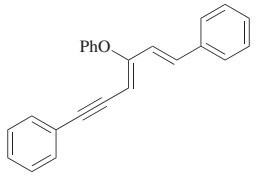
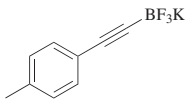
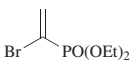
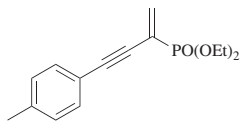
C_6  2.0 eq		$Pd(PPh_3)_4$ (5 mol %), CuI (5 mol %), DMF, 60°, 36 h		(98)	220
C_8  1.36 eq Generated in situ from the corresponding alkynyl lithium reagent		$Pd(PPh_3)_4$ (1 mol %), DME/THF (10:1), 80°, 5 h		(60)	139
 1.5 eq		$Pd_2(dba)_3$ (2.5 mol %), DPEPhos (5 mol %), CsF (3 eq), Cs_2CO_3 (3 eq), THF, 65°, 12 h		(20)	221
C_9  1.5 eq		$Pd_2(dba)_3$ (5 mol %), SPhos (20 mol %), Cs_2CO_3 (2 eq), toluene/water 4:1, 50°, 10 h		(82)	222

TABLE 12. CROSS-COUPLINGS OF ALKYNYLBORON REAGENTS WITH ARYL ELECTROPHILES

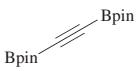
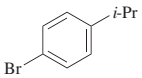
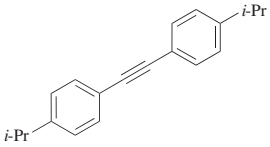
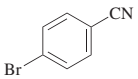
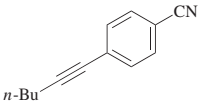
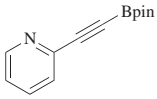
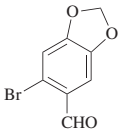
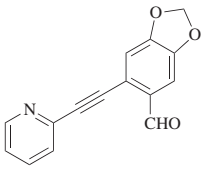
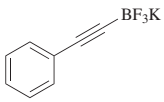
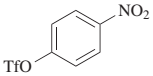
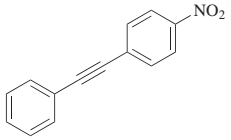
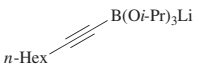
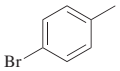
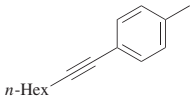
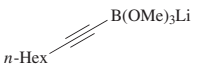
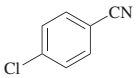
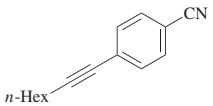
Alkynylboron Reagent	Aryl Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_2				
	 2 eq	$Pd_2(dba)_3$ (2 mol %), XPhos (8 mol %), K_3PO_4 (6 eq), THF, MW, 140°, 40 min	 (55)	183
C_6				
 1.0 eq		$Pd(dppf)Cl_2•CH_2Cl_2$ (9 mol %), Cs_2CO_3 (3 eq), THF/water (20:1), reflux, 12 h	 (98)	223
C_7				
 1.2 eq		$Pd(OAc)_2$ (0.1 mol %), HandaPhos (0.102 mol %), Et_3N (2 eq), Nok (2 wt %) in water, 25°, 28 h	 (83)	224
C_8				
 1.1 eq		$PdCl_2(dppf)•CH_2Cl_2$ (5 mol %), $(i\text{-Pr})_2NEt$ (3 eq), *i*-PrOH/water (2:1), MW, 100°, 15 min	 (96)	225
 1.36 eq		$Pd(PPh_3)_4$ (3 mol %), DME/THF (10:1), 80°, 5 h	 (98)	139
 1.3 eq		$Pd_2(dba)_3$ (3 mol %), SIPr•HCl (6 mol %), CsF (1 eq), DME/dioxane (1:1), reflux, 3 h	 (94)	226

TABLE 13. CROSS-COUPLINGS OF HETEROCYCLIC BORON REAGENTS

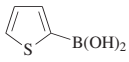
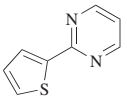
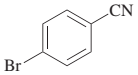
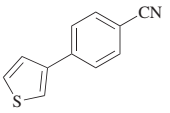
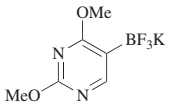
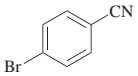
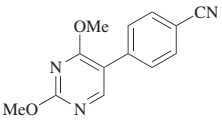
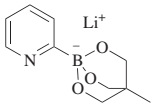
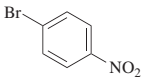
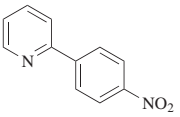
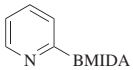
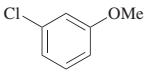
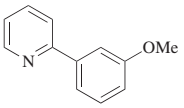
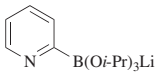
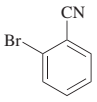
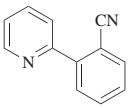
Heterocyclic Boron Reagent	Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_4				
 1.5 eq		Na_2PdCl_4 (0.5 mol %), **L6** (1 mol %), K_2CO_3 (2 eq), *n*-BuOH, 100°, 14 h	 (89)	227
 1.04 eq		$Pd(OAc)_2$ (1 mol %), RuPhos (2 mol %), Na_2CO_3 (2 eq), EtOH, 85°, 5 h	 (93)	182
 1.04 eq		$Pd(OAc)_2$ (3 mol %), RuPhos (6 mol %), Na_2CO_3 (2 eq), EtOH, 85°, 12 h	 (88)	182
C_5				
 1.1 eq		$Pd(OAc)_2$ (3 mol %), PPh_3 (3 mol %), CuI (20 mol %), DMF, 80°	 (90)	140
 1.5 eq		**XPhos Pd G1** (5 mol %), $Cu(OAc)_2$ (50 mol %), K_3PO_4 (5 eq), diethanolamine (1 eq), DMF, 100°, 24 h	 (96)	141
 1.5 eq		$Pd_2(dba)_3$ (1 mol %), **L7** (6 mol %), KF (3 eq), dioxane, 110°, 20 h	 (90)	228

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TABLE 14. CROSS-COUPLINGS OF HETEROCYLIC ELECTROPHILES

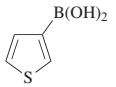
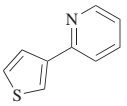
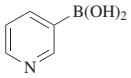
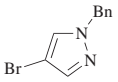
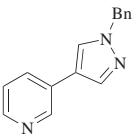
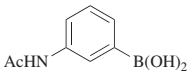
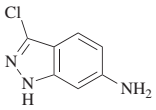
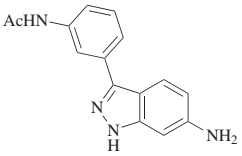
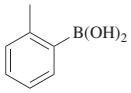
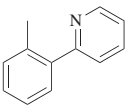
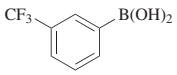
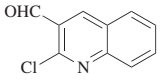
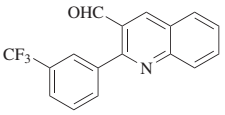
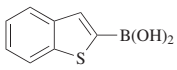
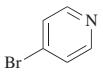
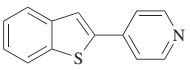
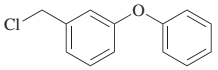
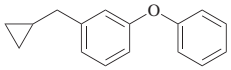
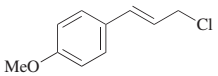
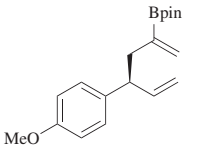
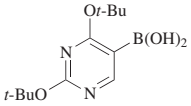
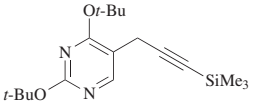
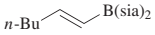
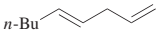
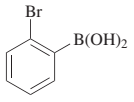
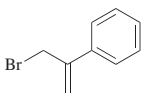
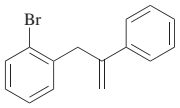
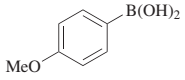
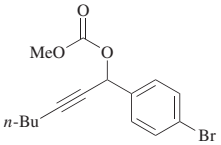
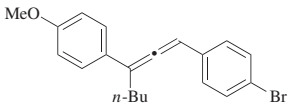
Organoboron Reagent	Heterocyclic Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_4  2 eq		$Pd_2Cl_2(allyl)_2$ (0.1 mol %), **L2** (0.2 mol %), K_2CO_3 (2 eq), xylenes, 130°, 20 h	 (90)	229
C_5  1.1 eq		$Pd_2(dba)_3$ (1 mol %), PCy_3 (2.4 mol %), K_3PO_4 (1.7 eq), dioxane/water (2:1), 100°, 18 h	 (73)	230
C_6  2 eq		**SPhos Pd G2** (2 mol %), K_3PO_4 (2 eq), dioxane/water (4:1), 100°, 15 h	 (90)	231
C_7  1.1 eq		$Pd_2(dba)_3$ (0.5 mol %), $P(t\text{-}Bu)_3$ (1 mol %), KF (3.3 eq), THF, rt, 24 h	 (97)	46
 1.2 eq		Na_2PdCl_4 (0.005 mol %), **L8** (0.01 mol %), K_2CO_3 (2 eq), *n*-BuOH/water (3:1), 100°, 12 h	 (95)	232
C_8  2 eq		$Pd_2Cl_2(allyl)_2$ (1 mol %), **L2** (2 mol %), K_2CO_3 (2 eq), xylenes, 130°, 20 h	 (90)	229

TABLE 15. CROSS-COUPLINGS OF ORGANOBORON REAGENTS WITH BENZYLIC, ALLYLIC, AND PROPARGYLIC ELECTROPHILES

Organoboron Reagent	Electrophile	Conditions	Product(s) and Yield(s) (%)	Refs.
Please refer to the charts preceding the tables for ligand and catalyst structures.				
C_3				
 1.75 eq		$Pd_2(dba)_3$ (5 mol %), RuPhos (10 mol %), K_2CO_3 (2 eq), toluene/water (19:1), sealed tube, 120°, 3 h	 (77)	233
 1.2 eq		$Pd_2Cl_2(allyl)_2$ (2.5 mol %), **L9** (5 mol %), CsF (10 eq), THF, 23°, 20 h	 (79) er 99.0:1.0	234
C_4				
 1.0 eq		$Pd(PPh_3)_4$ (2.5 mol %), $NaHCO_3$ (2.5 eq), DME/water (4:3), reflux, 4 h	 (32)	235
C_6				
	 1.2 eq	$Pd(PPh_3)_4$ (3 mol %), **L3** (2 mol %), NaOH (2 eq), benzene/water (3:1), reflux, 2 h	 (87)	236
 1.2 eq		$Pd(O_2CCF_3)_2$ (0.01 mol %), KOH (1.5 eq), water, 90°, 3 h	 (90)	181
 1.5 eq		$Pd_2(dba)_3$•$CHCl_3$ (2 mol %), **L10** (8 mol %), dioxane, 30°, 12 h	 (87)	237

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