Supporting Information

Trends in the Usage of Bidentate Phosphines as Ligands in Nickel Catalysis

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Table of Contents:

Table S1: Overall Numbers for Cross-Couplings, Section 2, Figure 2

Overall Cross-Coupling			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	Low	DPPF	11
		DIPPF	3
		DCEPhos	2
		CyXantphos	1
		DTBPF	2
		DPPP	2
		SL-J002-1	1
		Me-en-Duphos	1
		DCPE	4
		DPPE	5
		DCPF	1
		DPPP	2
		DCPM	2
		DPPE	2
		DPPM	1
		BINAP	7
		Segphos	2
		DCPT	2
		Xantphos	9
		DPPBenz	4
		PS-DPPE	1
		DEPBenz	1
		PS-DPPBenz	1
		DCPP	2
		DCPB	1
		SL-J005-1	1
		SL-J011-1	1
		W002	1
		SL-J009-1	1
		DPPB	4
		DM-OMe-Segphos	1
		iPr-Duphos	1
		Duanphos	1
		Planephos	1
		Skewphos	1
		tBu-Xantphos	1
		tBuPPF	1
	Moderately Low	DPPE	4
		DCPF	3
		BINAP	6
		DPPBenz	2

		DPPP	4
		Xantphos	2
		DCPP	2
		DCPB	1
		DCPE	6
		DPPF	3
		SL-J009-1	1
		W001	1
		SL-J003-1	1
		SL-J001-1	1
		xyl-BINAP	1
		DIOP	1
		Difluorphos	2
		C3-Tunephos	1
		DPPB	1
		DPPP	1
	Moderately High	DPPF	5
		DPPB	6
		DM-Segphos	3
		DCPP	2
		DCPE	3
		DCPM	1
		DCPB	2
		BINAP	4
		DPPPent	1
		DCPF	1
		DPEPhos	4
		Xantphos	4
		DPPE	4
		DCPT	1
		SL-J003-1	1
		SL-J007-1	1
		SL-J404-1	1
		SL-J003-3	1
		SL-J002-2	1
		DPPP	4
		Segphos	2
		OMe-BIPHEP	1
		Difluorphos	1
		Cl-BINAP	1
		xyl-BINAP	1
		Me-Duphos	1
		DIPPF	1
	High	Me-Duphos	1

		DCPE	9
		DPPE	5
		DPPP	4
		DPPF	11
		BINAP	7
		tBu-Xantphos	1
		DPEPhos	1
		PS-DPPE	1
		SL-J003-1	2
		DIPPBenz	1
		SL-J001-1	1
		SL-J015-1	1
		SL-J006-1	1
		DTBPE	1
		DPPB	2
		Difluorphos	2
		DCPT	3
		tol-BINAP	2
		8H-BINAP	1
		8H-O_4-BINAP	1
		NiXantphos	3
		DPPHex	1
		DIOP	1
		DCypPB	1
Ni(acac)$_2$	Low	DPPF	3
		Xantphos	1
		DPEPhos	1
		BINAP	2
		SL-J001-2	1
		DCPE	2
		DPPP	3
		DPPB	1
		DCPE	1
		DPPE	2
	Moderately Low	DPPB	1
		DCPT	1
		DPPP	2
		DIOP	1
		DPEPhos	1
	Moderately High	DPPF	4
		DPPE	2
		DPPB	1
		DPPP	2
		DPEPhos	1

	High	DPPP	2
		DPPE	2
		DPPB	1
		DPPF	1
		DPPHex	1
		DPPO	2
		DPEPhos	5
		Xantphos	1
$Ni(OAc)_2$	Low	DPEPhos	1
		BINAP	2
		DPPF	1
		DCPE	1
		DPPE	3
		DPPF	1
		DPPP	1
		DPPB	1
	Moderately Low	Xantphos	3
		DPPF	1
		DPPP	1
	Moderately High	DPPP	1
	High	Me-Duphos	1
		DPPP	2
		DPPE	1
		DPPF	1
		DPPB	1
$(dppp)NiCl_2$	High	DPPP	5
		DPPF	5
		DPPE	1
	Low	DPPE	1
		DPPP	2
		DPPF	1
	Moderately High	DPPP	1
$(PPh_3)_2NiCl_2$	Low	DPPM	1
		Me-Duphos	1
	Moderately Low	DPPE	1
		DIOP	1
		DPPP	1
	Moderately High	DPPB	1
		DPPF	1
		DPPP	1
		4H-BINAP	1
		Chiraphos	1
		DCPE	1
	High	BINAP	1

		DPPF	2
		DPPP	1
		DPEPhos	1
		Me-Duphos	1
Others	Various	Ligands	140

Table S2: Numbers for Aluminum, Section 2.1

Aluminum Cross-Couplings			
Ni Source	Yield	Ligand	Count
$Ni(acac)_2$	Low	BINAP	1
		SL-J001-1	1
		DCPE	1
	Moderately Low	DCPT	1
	Moderately High	DPPP	1
$Ni(cod)_2$	High	DCPE	1

Table S3: Numbers for Suzuki Couplings, Section 2.2.1, Figure 3

Suzuki Couplings			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	Moderately High	DPPF	2
		DPPB	2
		DM-Segphos	1
		DCPP	1
	Moderately Low	DPPE	1
		DCPF	1
		BINAP	1
		DPPBenz	1
		DPPP	1
	Low	DPPF	1
		DIPPF	1
		DCEPhos	1
		CyXantphos	1
		DTBPF	1
		DPPP	2
		SL-J002-1	1
		Me-en-Duphos	1
		DCPE	1
		DPPE	1
	High	Me-Duphos	1
		DCPE	3
		DPPE	1

$Ni(acac)_2$	Moderately High	DPPF	1
		DPPE	1
		DPPB	1
	Moderately Low	DPPB	1
	Low	DPPF	1
	High	DPPP	1
$[Bmim]_2[NiCl_4]$	Low	DPPF	1
$(dppe)NiCl_2$	High	DPPE	1
		Me-Duphos	1
	Moderately Low	DPPP	1
$NiCl_2$	High	DPPP	1
		DPPE	1
		DPPB	1
$(9\text{-}P)NiCl(PPh_3)_2$	Moderately Low	DPPP	1
	High	DPPF	1
$(PPh_3)_2NiCl_2$	High	Me-Duphos	1
	Moderately Low	DPPP	1
$(PPh_3)_2NiBr_2$	High	Me-Duphos	1
$Ni(OAc)_2$	Low	DCPE	1
	Moderately High	DPPP	1
$Ni(OTf)_2$	High	DPPE	1
$Ni(ClO_4)_2 \cdot 6H_2O$	Moderately Low	DPPP	1

Table S4: Numbers for Borylation Reactions, Section 2.2.2, Figure 4

Borylation Reactions			
Ni source	Yield	Ligand	Count
$(dppp)NiCl_2$	High	DPPP	4
		DPPF	5
		DPPE	1
	Low	DPPE	1
		DPPP	2
		DPPF	1
	Moderately High	DPPP	1
$(dppe)NiCl_2$	High	DPPE	1
	Low	DPPE	2
$(dppf)NiCl_2$	Moderately Low	DPPF	1
	Low	DPPP	1
		DPPF	1
$(PPh_3)_2NiCl_2$	High	DPPP	1
$Ni(cod)_2$	High	DPPP	1
		BINAP	3

		tBu-Xantphos	1
	Low	BINAP	1
		Segphos	1
		DPPE	2
		DCPT	1
		DCPE	1
		DCEPhos	1
		DPPF	1
	Moderately Low	DCPF	1
		DCPP	1
		DCPB	1
		DCPE	2
	Moderately High	DPPB	1
$Ni(NO_3)_2•6H_2O$	Moderately Low	DPPF	1
	Low	DPPE	1

Table S5: Numbers for Heck Reactions, Section 2.3.1, Figure 5

Heck Reactions			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	Low	Xantphos	1
		tBuPPF	1
		DTBPF	1
		DIPPF	1
		DPPB	1
		DCPP	1
	Moderately Low	Xantphos	1
		DPPF	1
		BINAP	1
		DPPP	1
	Moderately High	DIPPF	1
		DCPB	1
		DPPB	1
		DPPP	1
	High	DPPF	2
		DIOP	1
		DCypPB	1
$Ni(OAc)_2$	Moderately Low	DPPP	1
		Xantphos	1
	High	DPPP	1
		DPPE	1
		DPPF	1

		DPPB	1
$Ni(PPh_3)_4$	High	DPPP	2
	Moderately Low	Xantphos	1
$Ni(P(OPh)_3)_4$	Moderately High	DPPF	1
		DPPE	1
$Ni(P(OEt)_3)_4$	Low	DPPF	1
		Xantphos	1
		DPPPent	1
	High	DPPE	1
Others (Huang)	Moderately Low	Xantphos	11

Table S6: Numbers for Sonogashira Couplings, Section 2.3.2.

Alkynes (Sonogashira Coupling)			
Ni source	Yield	Ligand	Count
$Ni(acac)_2$	Low	Xantphos	1
		DPEPhos	1
		BINAP	1
	Moderately High	DPPF	1
$NiCl_2$	Moderately High	Xantphos	1
	Low	DPEPhos	1
		BINAP	1
		DPPF	1
$Ni(OAc)_2$	Moderately Low	Xantphos	1
	Low	DPEPhos	1
		BINAP	1
		DPPF	1
$NiCl_2$	High	Xantphos	1
	Low	DPEPhos	1
		BINAP	1
		DPPF	1
$Ni(cod)_2$	Moderately High	DCPE	1
		DCPP	1
		DCPM	1
		DCPB	1
	Low	DCPF	1
Others (Lee)	Low	Xantphos	6

Table S7: Numbers for Alpha-Arylation of Carbonyls, Section 2.3.3.

Alpha-Arylation of Carbonyls			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	High	DPPB	1

		BINAP	4
		Difluorphos	2
		DCPT	2
		tol-BINAP	2
		8H-BINAP	1
		8H-O_4-BINAP	1
	Moderately Low	xyl-BINAP	1
		DIOP	1
		Difluorphos	2
		C3-Tunephos	1
	Moderately High	Segphos	2
		DM-Segphos	2
		BINAP	1
		OMe-BIPHEP	1
		Difluorphos	1
		Cl-BINAP	1
		xyl-BINAP	1
		Me-Duphos	1
	Low	Segphos	1
		DM-OMe-Segphos	1
		iPr-Duphos	1
		Duanphos	1
		Planephos	1
		Skewphos	1
$(PPh_3)_2NiCl_2$	Moderately High	DCPE	1

Table S8: Numbers for Benzylic Cross-Coupling, Section 2.3.4

Benzylic Cross-Coupling			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	High	NiXantphos	3
		DPPF	1
		BINAP	1
		DPPP	1
	Low	Xantphos	2
		tBu-Xantphos	1
	Moderately High	DPPE	2
		Xantphos	1
		BINAP	1
	Moderately Low	DPPB	1
		DCPE	2
$NiBr_2$	Moderately High	DPPF	1
	High	NiXantphos	1

$NiCl_2$	Moderately Low	DPPF	1

Table S9: Numbers for Heteroarene Cross-Coupling, Section 2.3.5

Heteroarene Cross-Coupling			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	High	DCPE	6
		DCPT	1
	Low	DEPE	1
		DPPE	1
	Moderately High	DCPT	1
		2,3-DCPT	1
		2,3-benzothiazole	1
		DCPE	1
$NiBr_2$	High	DPPE	1
		DPPP	1
		DPPB	1
		DPPF	1
		Xantphos	1
	Moderately Low	DPPM	1
$Ni(OAc)_2$	Moderately Low	DPPE	1
		DPPF	1
		DCPT	1
	Low	DCPE	1

Table S10: Numbers for Phenyl Anion Cross-Coupling, Section 2.3.6

Phenyl Anion Cross-Coupling			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	High	DPPB	1
		DPPHex	1
	Moderately High	DPPF	1
		DPPP	1
	Low	DPPE	1

Table S11: Numbers for Cyanation Reactions, Section 2.4, Figure 6

Cyanation Reactions			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	Low	DPPF	1
		BINAP	1
		DCPT	1
		Xantphos	1

	Moderately High	DCPE	1
	High	DPPF	1
		DCPE	2
	Moderately Low	DPPP	1
		DPPF	1
$NiCl_2$•$6H_2O$	High	DPPF	2
		Xantphos	1
		DPPB	1
	Moderately Low	DPPB	1
		DPPF	1
	Moderately High	DCPE	1
	Low	DPPE	1
$NiBr_2$	Moderately High	DPPF	1
		DCPE	1
	High	DCPE	2
$Ni(acac)_2$	Low	DPPF	1
		DPPB	1
		DCPE	1
(dme)$NiBr_2$	High	DPPF	1
		DPPB	1
		DPEPhos	1
	Moderately Low	Xantphos	1
(tmeda)Ni(Cl)(*o*-tol)	High	DPPF	1
NiI_2	High	DPPF	1

Table S12: Numbers for Kumada Couplings, Section 2.5, Figure 7

Kumada Couplings			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	High	BINAP	2
		DPEPhos	1
	Moderately High	DPPB	1
		BINAP	2
		DPPPent	1
		DCPF	1
		DPEPhos	2
		Xantphos	2
	Moderately Low	DCPE	1
	Low	BINAP	1
		DPPF	2
$Ni(acac)_2$	High	DPPE	1
		DPPB	1
		DPPF	1

		DPPHex	1
		DPPO	1
		DPPP	1
	Moderately Low	DPPP	1
	Low	DPPE	1
$(dppe)NiCl_2$	High	Xantphos	1
	Moderately High	DPPE	1
		DPPP	1
		DPPB	1
		BINAP	1
	Moderately Low	DPPM	1
	Low	DPPE	1
$NiCl_2$	High	DPPF	1
	Moderately Low	Norphos	1
	Low	BIPHEMP	1
$NiBr_2$	Moderately High	BINAP	1
$(dppf)NiCl_2$	High	DPPF	1
$(dppp)NiCl_2$	High	DPPP	1
$NiCl_2 \cdot 6H_2O$	Low	DPPF	1
$(PPh_3)_2NiCl_2$	Moderately High	Chiraphos	1

Table S13: Numbers for Buchwald-Hartwig Couplings with Amines, Section 2.6, Figure 8

Buchwald-Hartwig Couplings with Amines			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	High	DPPF	3
		PS-DPPBenz	1
		SL-J003-1	1
		DIPPBenz	1
	Moderately High	DPPF	2
		DPPE	1
		DCPT	1
		SL-J003-1	1
	Moderately Low	BINAP	2
		DPPP	1
		DCPE	1
	Low	BINAP	1
		DPPBenz	2
		SciOPP	1
		PS-DPPE	1
		DEPBenz	1
		PS-DPPBenz	1
		DCPM	1

		DCPP	1
		DCPB	1
$Ni(P(OPh)_3)_4$	Low	DPPE	1
		Xantphos	1
		DTBPF	1
	Moderately High	DPPF	1
		BINAP	1
		DCPF	1
		DIPPF	1
		p-CF3-DPPF	1
		p-OMe-DPPF	1
$Ni(OTf)_2$	High	DCPP	1
		DCPE	1
	Low	DMPP	1
Ni/C	High	DPPF	1
	Low	DPPP	1
$(dppf)Ni(P(OPh)_3)_2$	High	DPPF	1

Table S14: Numbers for Ammonia Cross-Coupling, Section 2.6.2

Ammonia Cross-Coupling			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	High	SL-J001-1	1
		SL-J015-1	1
		SL-J006-1	1
		SL-J003-1	1
		DTBPE	1
	Moderately High	SL-J007-1	1
		SL-J404-1	1
		SL-J003-3	1
		SL-J002-2	1
	Moderately Low	BINAP	2
		SL-J009-1	1
		W001	1
		SL-J003-1	1
		SL-J001-1	1
	Low	DPPF	2
		DIPPF	1
		SL-J005-1	1
		SL-J011-1	1
		W002	1
		Xantphos	1
		SL-J009-1	1

(binap)Ni(P(OPh)$_3$)$_2$	High	BINAP	1

Table S15: Numbers for Phosphorus Cross-Coupling, Section 2.7

Phosphorylation			
Ni Source	Yield	Ligand	Count
Ni(cod)$_2$	High	DCPE	1
	Low	DPPF	1
		DPPP	1
Ni(acac)$_2$	Low	DPPP	1
Phosphinylation			
Ni Source	Yield	Ligand	Count
Ni(OAc)$_2$	Moderately High	DCPT	1
	Low	DCPE	1
		DPPE	1

Table S16: Numbers for Sulfur Cross-Couplings, section 2.8

Sulfur Cross-Coupling			
Ni Source	Yield	Ligand	Count
Ni(cod)$_2$	Low	DPPE	1
		DPPM	1
		DPPP	1
		BINAP	1
	Moderately Low	DCPF	1
		Xantphos	1
	High	DPPF	2
(dppf)NiCl$_2$	High	DPPF	1

Table S17: Numbers for Stille Couplings, Section 2.9.1

Stille Couplings			
Ni Source	Yield	Ligand	Count
Ni(acac)$_2$	Low	DPPP	1
	Moderately High	DPPF	1
Ni(cod)$_2$	Low	DCPM	1

Table S18: Numbers for Stannylation Reactions, Section 2.9.2, Figure 10

Stannylation Reactions			
Ni source	Yield	Ligand	Count
Ni(cod)$_2$	Moderately Low	DCPP	1

		DCPE	1
		DPPP	1
	High	DCPE	1
		DPPP	1
$NiBr_2$	Low	DPPE	1
		DPPB	1
	Moderately High	Xantphos	1
		DPPF	1
$Ni(acac)_2$	Low	DCPE	1
$(dcpe)NiCl_2$	Moderately Low	DCPE	1

Table S19: Numbers for Negishi Couplings, Section 2.10, Figure 11

Negishi Couplings			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	High	DPPE	3
		DPPF	1
	Low	DPPB	2
		Xantphos	3
		BINAP	2
		DPPBenz	1
		DPPF	1
	Moderately High	DPPE	1
		Xantphos	1
		DPEPhos	1
		DPPP	1
		DPPB	1
		DPEPhos	1
	Moderately Low	DPPE	1
$Ni(acac)_2$	Moderately High	DPPP	1
		DPPE	1
		DPEPhos	1
	Moderately Low	DIOP	1
		DPPP	1
		DPEPhos	1
	High	DPEPhos	5
		Xantphos	1
		DPPE	1
	Low	DPPF	1
		DPPE	1
$(dme)NiCl_2$	High	DPEPhos	2
		DPPE	1
	Moderately Low	Xantphos	1

	Moderately High	BINAP	1
$NiCl_2$	Moderately Low	DPPP	1
	Low	DPPE	1
$Ni(OAc)_2$	Low	DPPE	1
$Ni(OTf)_2$	High	DPPE	1

Table S20: Numbers for Cross-Electrophile Coupling, Section 2.12

Cross-Electrophile Coupling			
Ni source	Yield	Ligand	Count
$(PPh_3)_2NiCl_2$	High	DPEPhos	1
		DPPF	1
(dppe)$NiCl_2$	Moderately High	DPPF	1
(dppf)$NiCl_2$	Moderately High	DPPF	1
$Ni(acac)_2$	Moderately High	DPPF	1
NiI_2•$6H_2O$	High	DPPBenz	1
		DPPE	1
	Low	DPPBenz	1
$Ni(cod)_2$	Low	DPPE	1
		DPPF	1
	Moderately Low	DPPBenz	1
$NiCl_2$•$6H_2O$	Moderately High	DPPE	1
		DPPP	1
	Moderately Low	DPPF	1
		DPPB	1
$NiCl_2$	Low	DPPE	1
$NiCl_2$+$6H_2O$	Moderately High	DPPE	1
NiF_2•$4H_2O$	Low	DPPE	1
$NiBr_2$+$6H_2O$	Moderately High	DPPE	1
$Ni(OAc)_2$	Low	BINAP	1
		DPPE	1
		DPPB	1
	Moderately Low	Xantphos	1
		DPPF	1
	High	DPPP	1

Table S21: Numbers for Miscellaneous Cross-Couplings, Section 2.13

Miscellaneous Cross-Coupling Reactions			
Aldehyde			
Ni Source	Yield	Ligand	Count
$(PPh_3)_2NiCl_2$	Low	DPPM	1
	Low	Me-Duphos	1

	Moderately Low	DPPE	1
		DIOP	1
	Moderately High	DPPB	1
		DPPF	1
		DPPP	1
		4H-BINAP	1
	High	BINAP	1
Arsenic			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	Moderately Low	DPPE	1
Isocyanate			
Ni Source	Yield	Ligand	Count
$(dppe)NiBr_2$	High	DPPE	1
Nitrile			
Ni Source	Yield	Ligand	Count
$(dme)NiBr_2$	Moderately Low	DPPM	1
		DPPF	1
	Moderately High	DPPE	1
	High	DPPP	2
$Ni(cod)_2$	High	DPPP	1
Oxygen			
Ni Source	Yield	Ligand	Count
Ni(cod)2	High	DPPF	1
	High	DPPE	1
Silanes			
Ni Source	Yield	Ligand	Count
$Ni(OAc)_2•4H_2O$	Low	DPPF	1
		DCPE	1
NiF_2	Low	DCPE	1
$Ni(cod)_2$	High	DCPE	1
Sulfoximine			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	Moderately High	BINAP	1

Table S22: Numbers for Addition Reactions, Section 3

Addition Reactions - Overall			
Ni source	Yield	Ligand	Count
$Ni(cod)_2$	Low	DBFPhos	1
		DPEPhos	2
		BINAP	4
		DPPP	3
		DPPE	2

		DPPBenz	1
		iPr-Duphos	1
		DPPB	3
		DPPPent	1
		DPPHex	1
		DPPF	2
		SL-J001-1	1
		Me-Duphos	1
		Tangphos	1
		DMPP	1
		Prophos	1
		Chiraphos	1
		Skewphos	1
		SDP	1
		Ph-en-Duphos	1
		Norphos	1
		Tunephos	1
		xyl-BINAP	1
	Moderately Low	DPEPhos	1
		DPPE	1
		SL-J001-1	1
	Moderately High	DPEPhos	1
		Xantphos	3
		Me-Duphos	1
		DPPHex	1
		DPPP	1
		DIOP	1
		DPPE	1
		DCPE	1
	High	CF3-Thixantphos	1
		Thixantphos	3
		Sixantphos	3
		Xantphos	1
		Triptyphos	1
		Et-Duphos	1
		(R,R)-Et-Duphos	2
		DPPB	2
		DMPE	1
		DPEPhos	1
		DPPP	2
		DTBM-Segphos	1
		DTBM-OMe-BIPHEP	1
		DTBM-OH-BIPHEP	1
		DPPF	2

		DMPP	1
		BINAP	2
$Ni(acac)_2$	Low	Xantphos	2
		DPPF	1
		BINAP	3
		DPPB	1
		DCPP	2
		CyQuinoxP*	1
		MeQuinoxP*	1
		DCPT	1
		DPPBenz	2
		DCPE	1
		DTBPE	1
		DPPE	2
		DCPM	2
		DPPM	1
		DPPP	1
		1,1-DPPV	1
		DPPM	1
	Moderately Low	DPPP	1
		DCPBenz	1
		DPPM	1
		DPPE	1
	Moderately High	DPPPent	2
		QuinoxP*	1
		DPPM	2
		DPPB	1
		DPPE	1
	High	DPPP	1
		BenzP*	1
		DPPBenz	1
		DPPB	2
		DPPMB	1
		DPPE	1
$Ni(ClO_4)_2 \cdot 6H_2O$	Low	OMe-xyl-BIPHEP	1
	Moderately High	tol-BINAP	1
		xyl-BINAP	1
		OMe-tol-BIPHEP	1
		Segphos	1
		DTBM-Segphos	1
	High	BINAP	1
		Difluorphos	1
		Segphos	1
		O_4-BINAP	1

$NiCl_2$•$6H_2O$	High	DPPM	1
		DPPE	1
		DPPP	1
		DPPB	1
		DPPF	1
		DPEPhos	1
NiI_2	High	SL-J002-1	1
	Low	tol-Garphos	1
		BINAP	1
		Cl-OMe-BIPHEP	1
		tol-BINAP	1
		xyl-SDP	1
$NiCl_2$	Moderately High	DPPM	1
		Ph-en-Duphos	1
	High	DPPE	1
	Low	DIOP	1
		DPPE	1
(glyme)$NiCl_2$	High	DIOP	1
	Moderately High	DPPF	1
	Moderately Low	DPPB	1
$NiBr_2$	Low	DPPBenz	1
		Xantphos	1
$Ni(ClO_4)_2$	Low	DPPE	1
		SL-J001-1	1
$Ni(OAc)_2$•$4H_2O$	High	BINAP	1
(glyme)$NiBr_2$	Moderately Low	DPPB	1
[(allyl)NiBr]$_2$	Low	BINAP	1
$Ni(2\text{-}EH)_2$	Low	DPPE	1
$Ni(P(OPh)_3)_4$	Moderately Low	Xantphos	1
(dme)$NiCl_2$	High	Tangphos	1

Table S23: Numbers for Cycloaddition Reactions, Section 4

Cycloaddition Reactions			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	Low	Xantphos	1
		BINAP	2
		DIOP	2
		DCPB	1
		DPPB	1
		DPPP	2
		Me-Duphos	1
		Chiraphos	1
		DPPE	7

	Moderately Low	DBFPhos	1
		DPEPhos	1
		DPPF	1
		DPPPent	1
		BINAP	1
		DPPB	3
		DPPP	1
		DPPE	3
	Moderately High	BINAP	3
		DPPB	1
		DPPP	1
		DPPE	1
	High	Xantphos	1
		DPPF	1
		DIOP	2
		DPPB	10
		DPPP	1
		iPr-Duphos	1
		DMPE	1
		DPPE	3
$Ni(acac)_2$	Low	DPPB	1
		DPPE	1
		DPPP	1
$(dppe)NiBr_2$	High	DPPE	1
$NiCl_2$	Low	DPPP	1
$Ni(C_2H_4)_3$	Low	DPPM	1
		DPPE	1
		DPPP	1
		DPPB	1
$Ni(ClO_4)_2•6H_2O$	Moderately High	(3,5-tBu)-OMe-BIPHEP	1

Table S24: Numbers for C-H Functionalization Reactions, Section 5

C-H Functionalization Reactions			
Ni Source	Yield	Ligand	Count
$Ni(acac)_2$	Low	DPPB	1
		BINAP	1
		DPPM	1
		DPPE	1
		DPPF	1
	Moderately High	DPPB	3
		DPPE	1
		BINAP	1
$Ni(PPh_3)_4$	High	Xantphos	1

$Ni(cod)_2$	High	DPPBenz	1
		DPPP	1
		DPPP	1
	Moderately High	DCPE	1
	Moderately Low	DPPP	1
		Xantphos	1
		DPPF	1
	Low	DCPE	1
		DCPP	1
		D(Cyp)PMB	1
		DCPM	1
$(dme)NiCl_2$	High	rac-BINAP	1
	Moderately Low	BINAP	1
		DPPF	1
		DPPM	1
	Moderately High	Xantphos	1
$NiBr_2$	Low	BINAP	1
$Ni(Tfacac)_2•2H_2O$	Moderately High	DPPB	1
$Ni(OTf)_2$	Moderately High	DPPP	1
	High	BINAP	1

Table S25: All $Ni(cod)_2$-Catalyzed Reactions Combined

All $Ni(cod)_2$ Reactions Combined			
Ni Source	Yield	Ligand	Count
$Ni(cod)_2$	Low	DPPE	23
		DPPF	16
		BINAP	15
		DPPP	15
		DPPB	12
		Xantphos	12
		DPPBenz	9
		DCPE	8
		DCPM	4
		DCPP	4
		DCPF	3
		DIPPF	4
		DIOP	3
		Me-Duphos	3
		DPEPhos	3
		DCPB	2
		SL-J001-1	2
		Tunephos	2
		DPPM	2

		SL-J002-1	2
		iPr-Duphos	2
		Skewphos	2
		DCEPhos	2
		DTBPF	2
		Segphos	2
		DCPT	2
		Me-Duphos	1
		Chiraphos	1
		perF-DPPF	1
		iPr-en-Duphos	1
		perF-DPPE	1
		DIPPP	1
		QuinoxP*	1
		DIPPB	1
		Chiraphos	1
		DPPHex	1
		1,3-DCypPMB	1
		W003	1
		tBu_2-OMe-BIPHEP	1
		DPPMB	1
		DEPE	1
		DBFPhos	1
		DPPPent	1
		DPPHex	1
		Tangphos	1
		DMPP	1
		Prophos	1
		Chiraphos	1
		SDP	1
		Ph-en-Duphos	1
		Norphos	1
		xyl-BINAP	1
		CyXantphos	1
		Me-en-Duphos	1
		PS-DPPE	1
		DEPBenz	1
		PS-DPPBenz	1
		SL-J005-1	1
		SL-J011-1	1
		W002	1
		SL-J009-1	1
		DM-OMe-Segphos	1
		Duanphos	1

		Planephos	1
		SL-J010-1	1
		tBu-Xantphos	1
		tBuPPF	1
	Moderately Low	DPPE	12
		DCPE	8
		BINAP	7
		DPPP	7
		DPPB	5
		DPPF	5
		Xantphos	3
		DCPF	3
		DPEPhos	3
		DBFPhos	2
		DTBPE	2
		DIPPE	2
		SL-J003-1	2
		SL-J001-1	2
		DPPBenz	2
		DCPP	2
		Difluorphos	2
		DPPPent	1
		DCPB	1
		Binapine	1
		DIPPF	1
		DBP-Xantphos	1
		NiXantphos	1
		SL-J005-1	1
		Me_2-OMe-BIPHEP	1
		DCPB	1
		SL-J009-1	1
		W001	1
		xyl-BINAP	1
		DIOP	1
		C3-Tunephos	1
	Moderately High	BINAP	10
		DPPB	9
		DPPE	9
		DCPE	8
		DPPP	7
		Xantphos	7
		DPPF	6
		DPEPhos	4
		DM-Segphos	3

		DCPP	3
		Segphos	2
		DCPT	2
		DIOP	2
		DPEPhos	2
		DPPPent	2
		Me-Duphos	2
		DCPB	2
		2,3-DCPT	1
		2,3-benzothindole	1
		Chiraphos	1
		Et-Ferrotane	1
		SL-J001-1	1
		iPr2-OMe-BIPHEP	1
		DPPHex	1
		SL-J003-1	1
		SL-J007-1	1
		SL-J404-1	1
		SL-J003-3	1
		SL-J002-2	1
		DCPM	1
		OMe-BIPHEP	1
		Difluorphos	1
		Cl-BINAP	1
		xyl-BINAP	1
		DIPPF	1
		DCPF	1
		Et-Ferrocelane	1
	High	DCPE	19
		DPPF	17
		DPPB	16
		BINAP	12
		DPPE	10
		DPPP	8
		Xantphos	5
		iPr-Duphos	4
		DPEPhos	3
		DIOP	3
		Thixantphos	3
		Sixantphos	3
		NiXantphos	3
		DIOP	2
		DIPPE	2
		Me-Duphos	2

		(R,R)-Et-Duphos	2
		SL-J003-1	2
		DPPB	2
		Difluorphos	2
		DCPT	2
		tol-BINAP	2
		DPPHex	1
		DIOP	1
		DCypPB	1
		DMPE	1
		Tangphos	1
		Duanphos	1
		BenzP*	1
		Chiraphos	1
		DPPPent	1
		DPPM	1
		DIPAMP	1
		tBuPPF	1
		tBu-Xantphos	1
		POP-Xantphos	1
		MOD-DIOP	1
		DCPT	1
		DPPMB	1
		tol-BINAP	1
		OMe-BIPHEP	1
		Me-en-Duphos	1
		SL-J007-1	1
		Norphos	1
		Skewphos	1
		CF_3-Thixantphos	1
		Triptyphos	1
		Et-Duphos	1
		DMPE	1
		DPEPhos	1
		DTBM-Segphos	1
		DTBM-OMe-BIPHEP	1
		DTBM-OH-BIPHEP	1
		DMPP	1
		tBu-Xantphos	1
		PS-DPPBenz	1
		DIPPBenz	1
		SL-J001-1	1
		SL-J015-1	1
		SL-J006-1	1

		DTBPE	1
		8H-BINAP	1
		8H-O_4-BINAP	1

Table S26: Common Ligands in Ni(cod)$_2$-Catalyzed Reactions

Ni(cod)$_2$: Common Ligands			
Ni Source	Ligand	Yield	Count
Ni(cod)$_2$	DPPE	Low	22
		Moderately Low	12
		Moderately High	9
		High	10
	DPPP	Low	15
		Moderately Low	7
		Moderately High	7
		High	8
	DPPB	Low	11
		Moderately Low	5
		Moderately High	9
		High	16
	DPPF	Low	15
		Moderately Low	5
		Moderately High	6
		High	17
	Xantphos	Low	11
		Moderately Low	3
		Moderately High	7
		High	5
	BINAP	Low	15
		Moderately Low	7
		Moderately High	10
		High	12
	DCPE	Low	8
		Moderately Low	8
		Moderately High	8
		High	19

Table S27: Overall Common Nickel Sources

Overall Common Nickel Sources		
Ni source	Yield	Count
Ni(cod)$_2$	Low	199
	Moderately Low	83
	Moderately High	100

	High	167
$Ni(acac)_2$	Low	51
	Moderately Low	13
	Moderately High	24
	High	25
$Ni(OAc)_2$	Low	61
	Moderately Low	17
	Moderately High	8
	High	31
$NiCl_2$	Low	19
	Moderately Low	8
	Moderately High	3
	High	13
$NiBr_2$	Low	14
	Moderately Low	2
	Moderately High	4
	High	9
NiI_2	Low	10
	Moderately Low	1
	Moderately High	2
	High	3
(dme)$NiBr_2$	Low	18
	Moderately Low	9
	Moderately High	2
	High	7
(dme)$NiCl_2$	Low	6
	Moderately Low	6
	Moderately High	6
	High	11
$NiCl_2$•$6H_2O$	Low	2
	Moderately Low	4
	Moderately High	3
	High	12
(dppp)$NiCl_2$	Low	6
	Moderately Low	0
	Moderately High	1
	High	11
(dppe)$NiCl_2$	Low	3
	Moderately Low	3
	Moderately High	5
	High	4
(dppf)$NiCl_2$	Low	3
	Moderately Low	2
	Moderately High	2

	High	2
$(PPh_3)_2NiCl_2$	Low	4
	Moderately Low	7
	Moderately High	8
	High	6