

Initiating Search

November 24, 2023, 1:59PM

 Reactions:

Filtered By:

Yield: 90-100%, 80-89%

Number of 1

Steps:

Reaction Mapping Data Available

Mapping:

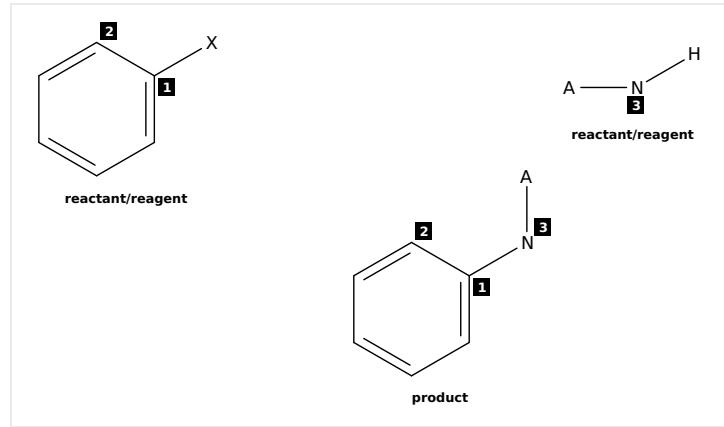
Experimental Experimental Procedure

Protocols:

Reagent: Sodium *tert*-butoxide, Cesium carbonate, Potassium carbonate, Potassium *tert*-butoxide, Tripotassium phosphate, Sodium hydroxide, Potassium hydroxide, Lithium bis(trimethylsilyl)amide, Sodium bicarbonate, Triethylamine, Piperidine, Diisopropylethylamine, Sodium hydride, 4-Methylmorpholine, Sodium carbonate, Sodium methoxide, Pyridine, 1,8-Diazabicyclo[5.4.0]undec-7-ene

Catalyst: Tris(dibenzylideneacetone)dipalladium, Palladium diacetate,

Bis(dibenzylideneacetone)palladium, Palladium, Bis(*tri-tert*-butylphosphine)palladium, (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- $\kappa\Lambda^3$)palladium, stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium, Tetrakis(triphenylphosphine)palladium, [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium, (*SP*-4-4)-[2-[2-(Amino- $\kappa\Lambda$ Methyl)phenyl- κC][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κP]chloropalladium, (*SP*-4-4)-[2-[2-(Amino- $\kappa\Lambda$ Methyl)phenyl- κC]chloro[dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine]palladium, Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, (*SP*-4-2)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chloro(2,4-pentanedionato- $\kappa O^2,\kappa O^4$)palladium, Palladium chloride, Stereoisomer of [1'-[bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene][(1,2,3- η)-(2*E*)-2-buten-1-yl]chloropalladium



Structure Match: Substructure

Commercial Availability: All Starting Materials
Document Type: Journal
Language: English
Publication Year: 2000 to 2016
Publication Name: Journal of Organic Chemistry, Organic Letters, Journal of the American Chemical Society, Synlett, Journal of Medicinal Chemistry, Synthesis, Organometallics, Journal of Combinatorial Chemistry, ACS Combinatorial Science, Macromolecules, Organic Process Research & Development, ACS Medicinal Chemistry Letters

Search Tasks

Task	Search Type	View
Exported: Returned Reaction Results + Filters (2,034)	 Reactions	View Results

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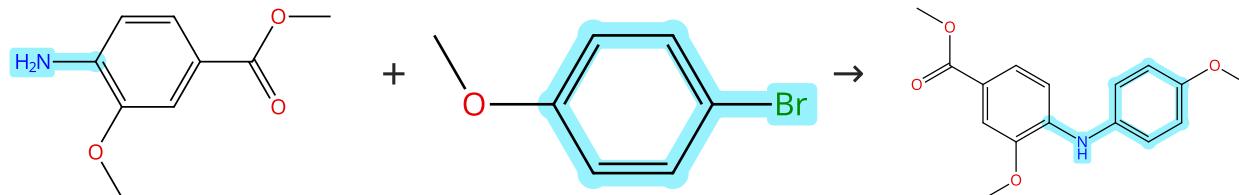
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Reactions (500)

[View in SciFinder®](#)

Scheme 1 (1 Reaction)


[Suppliers \(76\)](#)
[Suppliers \(79\)](#)
[Suppliers \(2\)](#)

31-172-CAS-10530369

Steps: 1 Yield: 100%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 2-Dicyclohexylphosphino-2',6'-dimethoxybiphenyl

Solvents: Toluene; 5 d, 110 °C

Experimental Protocols

Transition metals in organic synthesis. Part 85. A general approach to 1,6-dioxygenated carbazole alkaloids; first total synthesis of clausine G, clausine I, and clausine Z

By: Boerger, Carsten; et al

Synlett (2008), (11), 1698-1702.

Scheme 2 (1 Reaction)


[Suppliers \(3\)](#)
[Suppliers \(69\)](#)
[Supplier \(1\)](#)

31-172-CAS-5611803

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Bis(*tri-tert*-butylphosphine)palladium

Solvents: Toluene; 110 °C

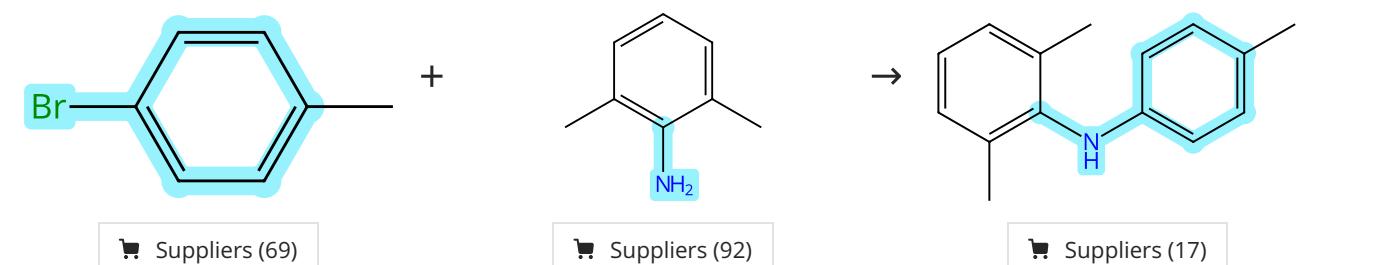
Experimental Protocols

Selective Synthesis of 5- or 6-Aryl Octahydrocyclopenta[b]pyrroles from a Common Precursor through Control of Competing Pathways in a Pd-Catalyzed Reaction

By: Ney, Joshua E.; et al

Journal of the American Chemical Society (2005), 127(24), 8644-8651.

Scheme 3 (1 Reaction)


[Suppliers \(69\)](#)
[Suppliers \(92\)](#)
[Suppliers \(17\)](#)

31-172-CAS-8378893

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, (1,1-Dimethylethyl)bis(2,2-dimethylpropyl)phosphine; rt

1.2 Solvents: Toluene; 2 h, 80 °C

Experimental Protocols

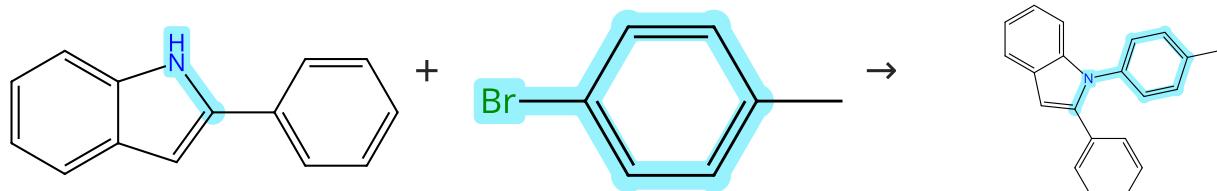
Trineopentylphosphine: a conformationally flexible ligand for the coupling of sterically demanding substrates in the Buchwald-Hartwig amination and Suzuki-Miyaura reaction

By: Raders, Steven M.; et al

Journal of Organic Chemistry (2013), 78(10), 4649-4664.

Scheme 4 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (90)

Suppliers (69)

Suppliers (4)

31-172-CAS-1358542

Steps: 1 Yield: 100%

1.1 Reagents: Sodium hydroxide

Catalysts: Palladium diacetate, 1*H*-Imidazolium, 1,3-bis(2,4,6-trimethylphenyl)-, chloride (1:1)

Solvents: Toluene

Experimental Protocols

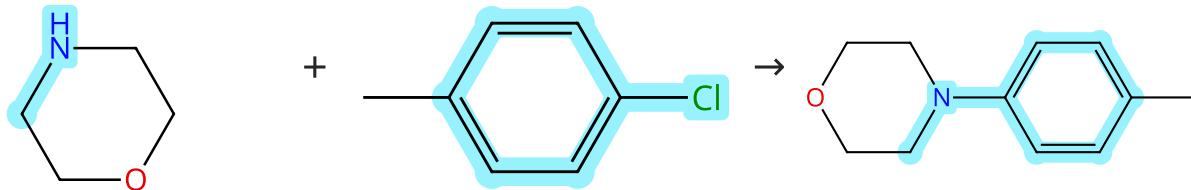
Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Scheme 5 (5 Reactions)

Steps: 1 Yield: 95-100%



Suppliers (76)

Suppliers (77)

Suppliers (57)

31-172-CAS-5392607

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-4,5-dihydro-, tetrafluoroborate(1-) (1:1)

Solvents: 1,2-Dimethoxyethane

Experimental Protocols

High turnover number and rapid, room-temperature amination of chloroarenes using saturated carbene ligands

By: Stauffer, Shaun R.; et al

Organic Letters (2000), 2(10), 1423-1426.

31-172-CAS-9841844

Steps: 1 Yield: 98%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- $\kappa\lambda^3$)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

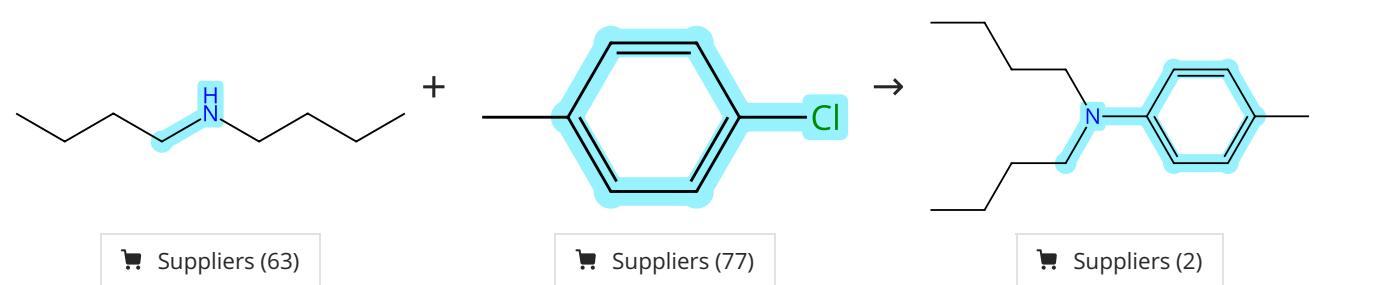
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

31-172-CAS-232041	Steps: 1 Yield: 98%	Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings By: Kataoka, Noriyasu; et al Journal of Organic Chemistry (2002), 67(16), 5553-5566.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene Solvents: Toluene	Experimental Protocols	
31-172-CAS-9200000	Steps: 1 Yield: 95%	Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions By: Marion, Nicolas; et al Journal of the American Chemical Society (2006), 128(12), 4101-4111.
1.1 Reagents: Potassium <i>tert</i> -butoxide Catalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium Solvents: 1,2-Dimethoxyethane; 2 min, rt	Experimental Protocols	
31-172-CAS-14657667	Steps: 1 Yield: 95%	P[N(i-Bu)CH ₂ CH ₂] ₃ N: A Versatile Ligand for the Pd-Catalyzed Amination of Aryl Chlorides By: Urgaonkar, Sameer; et al Organic Letters (2003), 5(6), 815-818.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane Solvents: Toluene; 80 °C	Experimental Protocols	

Scheme 6 (5 Reactions)



31-172-CAS-5920252	Steps: 1 Yield: 100%	Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides By: Kuwano, Ryoichi; et al Journal of Organic Chemistry (2002), 67(18), 6479-6486.
1.1 Reagents: Potassium hydroxide, Water Catalysts: Hexadecyltrimethylammonium bromide, Bis(<i>tri-tert</i> -butylphosphine)palladium Solvents: Toluene	Experimental Protocols	
31-172-CAS-5876914	Steps: 1 Yield: 100%	Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides By: Kuwano, Ryoichi; et al Journal of Organic Chemistry (2002), 67(18), 6479-6486.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Bis(<i>tri-tert</i> -butylphosphine)palladium Solvents: Toluene	Experimental Protocols	
31-172-CAS-8619604	Steps: 1 Yield: 98%	Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides By: Hill, Lensey L.; et al Journal of Organic Chemistry (2006), 71(14), 5117-5125.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Palladium diacetate, Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine Solvents: Toluene; 17 h, 80 °C	Experimental Protocols	

31-172-CAS-11655564

Steps: 1 Yield: 97%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 90 min, rt

Experimental Protocols

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

31-172-CAS-10889080

Steps: 1 Yield: 95%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

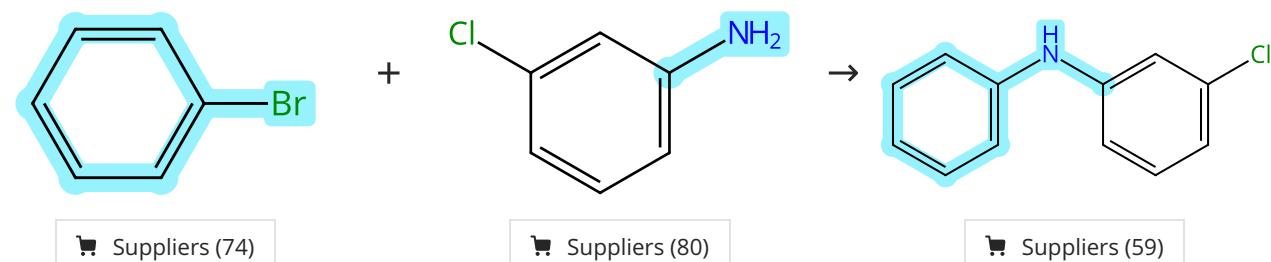
Solvents: 1,4-Dioxane

Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Experimental Protocols

Scheme 7 (1 Reaction)

31-172-CAS-5692856

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

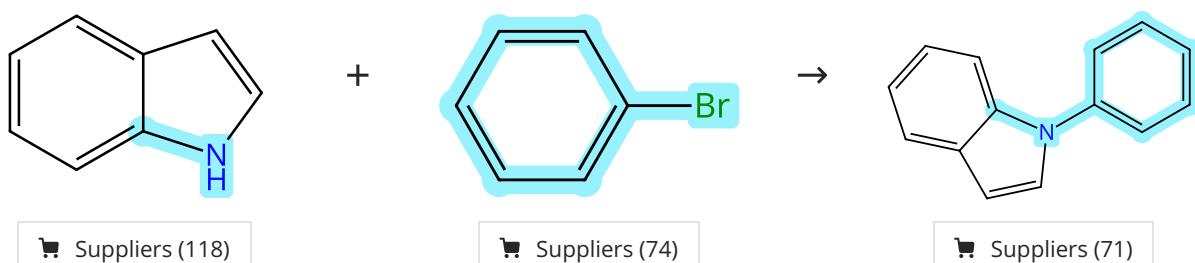
Solvents: Toluene; 11 h, 90 - 110 °C

Experimental Protocols

Anionic N-Fries Rearrangement of N-Carbamoyl Diarylamines to Anthranilamides. Methodology and Application to Acridone and Pyranoacridone Alkaloids

By: MacNeil, Stephen L.; et al

Organic Letters (2006), 8(6), 1133-1136.

Scheme 8 (1 Reaction)

31-172-CAS-6243835

Steps: 1 Yield: 100%

1.1 Reagents: Sodium hydroxide

Catalysts: Palladium diacetate, 1*H*-Imidazolium, 1,3-bis(2,4,6-trimethylphenyl)-, chloride (1:1)

Solvents: 1,4-Dioxane

Experimental Protocols

Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Scheme 9 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (90)

Suppliers (74)

Suppliers (26)

31-172-CAS-3489894

Steps: 1 Yield: 100%

1.1 Reagents: Sodium hydroxide

Catalysts: Palladium diacetate, 1*H*-Imidazolium, 1,3-bis(2,4,6-trimethylphenyl)-, chloride (1:1)

Solvents: Toluene

Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

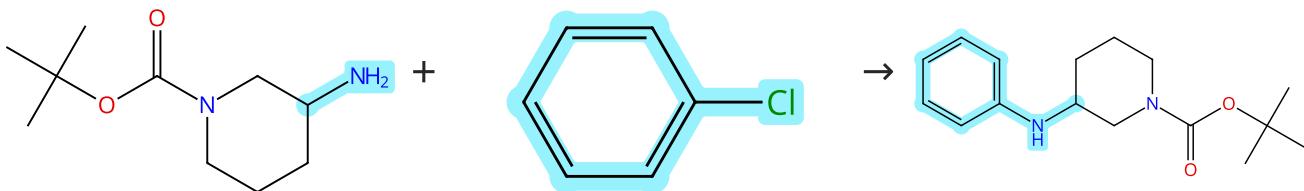
By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Experimental Protocols

Scheme 10 (2 Reactions)

Steps: 1 Yield: 100%



Suppliers (116)

Suppliers (136)

Suppliers (36)

31-172-CAS-7326938

Steps: 1 Yield: 100%

Palladium-Mediated Arylation of 3-Aminopiperidines and 3-Aminopyrrolidines

By: Jean, Ludovic; et al

Journal of Organic Chemistry (2004), 69(25), 8893-8902.

Experimental Protocols

31-172-CAS-9493674

Steps: 1 Yield: 100%

Palladium-Mediated Arylation of 3-Aminopiperidines and 3-Aminopyrrolidines

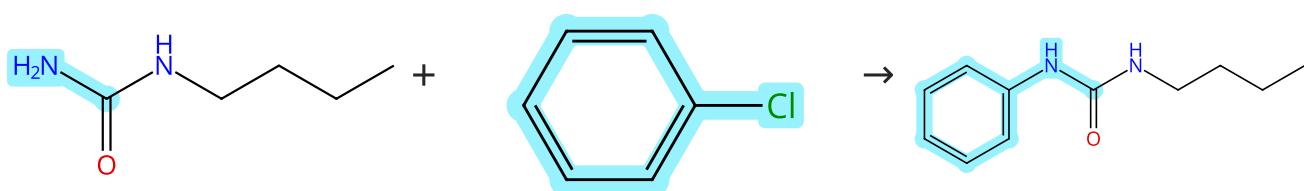
By: Jean, Ludovic; et al

Journal of Organic Chemistry (2004), 69(25), 8893-8902.

Experimental Protocols

Scheme 11 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (57)

Suppliers (136)

Suppliers (16)

31-172-CAS-12023261

Steps: 1 Yield: 100%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 5-[Bis(1,1-dimethylethyl)phosphino]-1',3',5'-triphenyl-1,4'-bi-1*H*-pyrazole

Solvents: 1,2-Dimethoxyethane; 1 h, rt

1.2 rt; rt → 85 °C; 2 h, 85 °C; 85 °C → rt

1.3 Solvents: Dimethylformamide; 30 min, rt

Experimental Protocols

A General Method for the Synthesis of Unsymmetrically Substituted Ureas via Palladium-Catalyzed Amidation

By: Kotecki, Brian J.; et al

Organic Letters (2009), 11(4), 947-950.

Scheme 12 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (70)

Suppliers (136)

Suppliers (32)

31-172-CAS-9903269

Steps: 1 Yield: 100%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 5-[Bis(1,1-dimethylethyl)phosphino]-1',3',5'-triphenyl-1,4'-bi-1*H*-pyrazole

Solvents: 1,2-Dimethoxyethane; 1 h, rt

1.2 rt; rt → 85 °C; 2 h, 85 °C; 85 °C → rt

1.3 Solvents: Dimethylformamide; 30 min, rt

Experimental Protocols

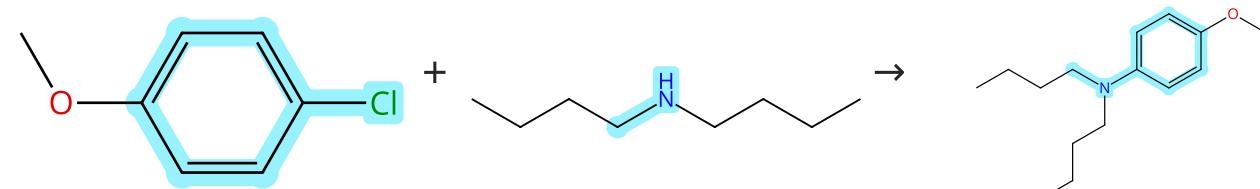
A General Method for the Synthesis of Unsymmetrically Substituted Ureas via Palladium-Catalyzed Amidation

By: Kotecki, Brian J.; et al

Organic Letters (2009), 11(4), 947-950.

Scheme 13 (2 Reactions)

Steps: 1 Yield: 98-100%



Suppliers (79)

Suppliers (63)

Suppliers (2)

31-172-CAS-2537947

Steps: 1 Yield: 100%

1.1 Reagents: Potassium *tert*-butoxide

Catalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3-η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 120 min, rt

Experimental Protocols

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

31-172-CAS-2330155

Steps: 1 Yield: 98%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

Solvents: 1,4-Dioxane

Experimental Protocols

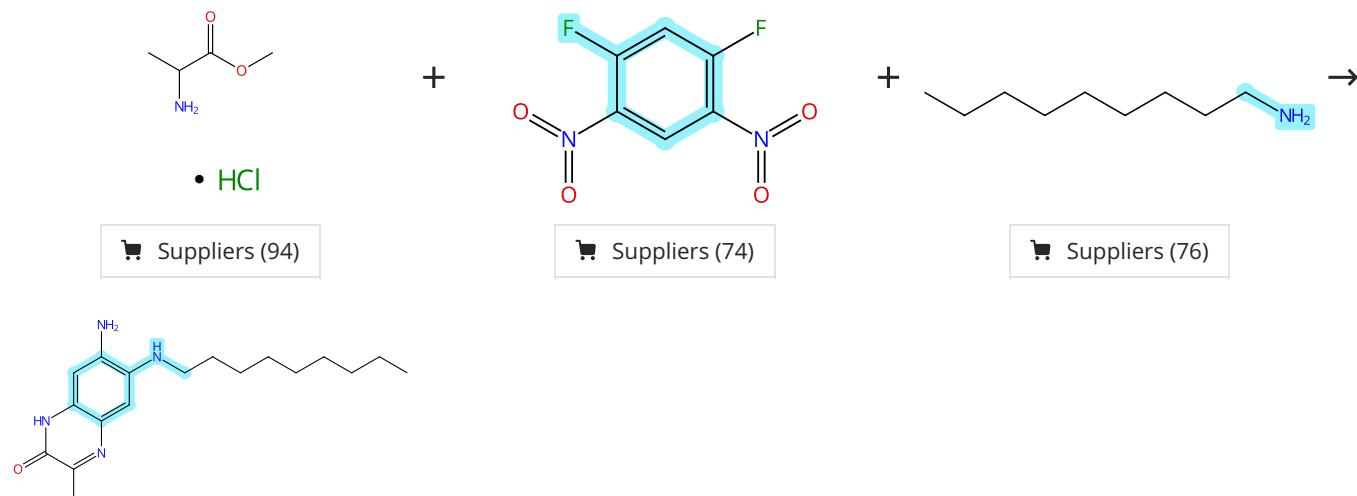
Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Scheme 14 (1 Reaction)

Steps: 1 Yield: 100%



31-172-CAS-5527324

Steps: 1 Yield: 100%

1.1 Reagents: Diisopropylethylamine
Solvents: Tetrahydrofuran; 3 h, rt

1.2 15 h, rt

1.3 Reagents: Ammonium formate, Sulfuric acid
Catalysts: Palladium
Solvents: Ethanol, Tetrahydrofuran, Water; 12 h, 2.8 - 3.0 bar,
40 °C**Parallel Approach for Solution-Phase Synthesis of 2-Quinoxalinol Analogues and Their Inhibition of LPS-Induced TNF- α Release on Mouse Macrophages in Vitro**

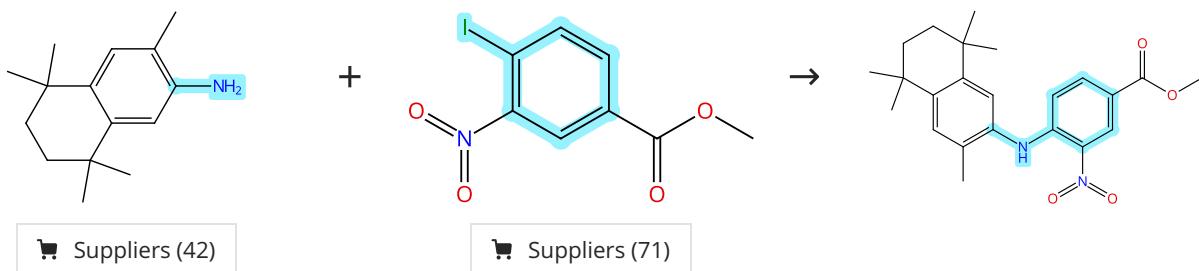
By: Zhang, Liang; et al

Journal of Combinatorial Chemistry (2004), 6(3), 431-436.

Experimental Protocols

Scheme 15 (1 Reaction)

Steps: 1 Yield: 100%



31-172-CAS-10304412

Steps: 1 Yield: 100%

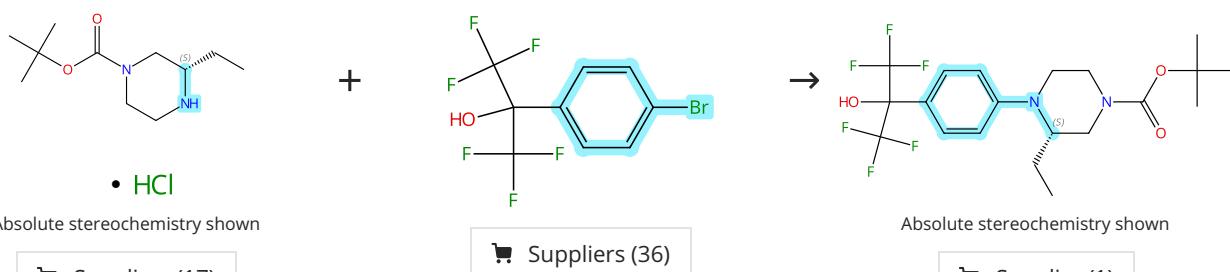
1.1 Reagents: Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; overnight, 110 °C**Mechanism of Retinoid X Receptor Partial Agonistic Action of 1-(3,5,5,8,8-Pentamethyl-5,6,7,8-tetrahydro-2-naphthyl)-1H-benzotriazole-5-carboxylic Acid and Structural Development To Increase Potency**

By: Ohsawa, Fuminori; et al

Journal of Medicinal Chemistry (2013), 56(5), 1865-1877.

Scheme 16 (1 Reaction)

Steps: 1 Yield: 100%



31-172-CAS-12568658

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine

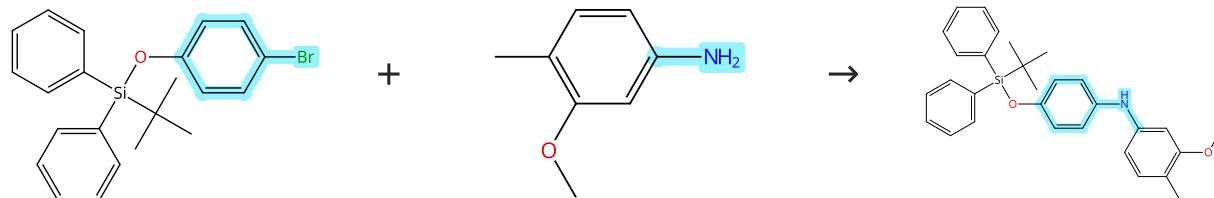
Solvents: Toluene; 29 h, 100 °C

Experimental Protocols

Small Molecule Disruptors of the Glucokinase-Glucokinase Regulatory Protein Interaction: 1. Discovery of a Novel Tool Compound for in Vivo Proof-of-Concept

By: Ashton, Kate S.; et al

Journal of Medicinal Chemistry (2014), 57(2), 309-324.

Scheme 17 (1 Reaction)

Suppliers (11)

Suppliers (86)

Steps: 1 Yield: 100%

31-172-CAS-11626170

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

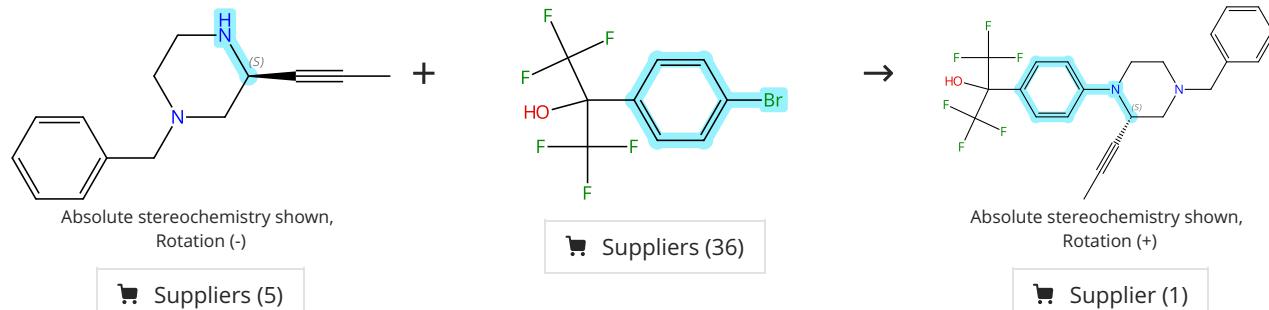
Solvents: Toluene; 2 h, reflux; 24 h, reflux

Experimental Protocols

Synthesis of the Pyrano[3,2-*a*]carbazole Alkaloids Koenine, Koenimbine, Koenigine, Koenigicine, and Structural Reassignment of Mukonicine

By: Schuster, Christian; et al

Synthesis (2016), 48(1), 150-160.

Scheme 18 (1 Reaction)Absolute stereochemistry shown,
Rotation (-)

Suppliers (5)

Steps: 1 Yield: 100%

Absolute stereochemistry shown,
Rotation (+)

Supplier (1)

31-172-CAS-10626202

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium

Solvents: 1,4-Dioxane; rt → 70 °C; 12 h, 80 °C

Experimental Protocols

Nonracemic Synthesis of GK-GKRP Disruptor AMG-3969

By: Bourbeau, Matthew P.; et al

Journal of Organic Chemistry (2014), 79(8), 3684-3687.

Scheme 19 (1 Reaction)

Suppliers (42)

Suppliers (60)

Suppliers (2)

Steps: 1 Yield: 100%

31-172-CAS-1012870

Steps: 1 Yield: 100%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Palladium diacetate, Tri-*tert*-butylphosphine

Solvents: Toluene; 3 d, 80 °C

Experimental Protocols

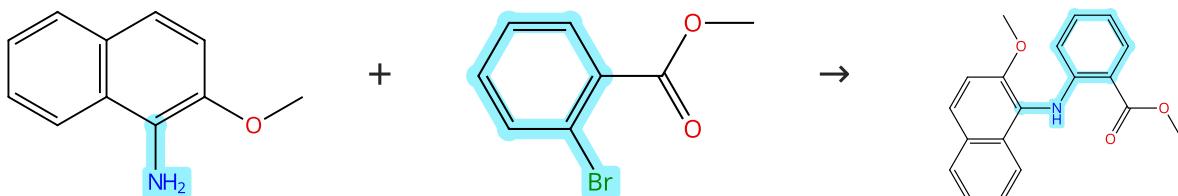
Design of NIR-Absorbing Simple Asymmetric Squaraine Dyes Carrying Indoline Moieties for Use in Dye-Sensitized Solar Cells with Pt-Free Electrodes

By: Funabiki, Kazumasa; et al

Organic Letters (2012), 14(5), 1246-1249.

Scheme 20 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (45)

Suppliers (90)

Supplier (1)

31-172-CAS-1665561

Steps: 1 Yield: 100%

1.1 Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 30 s, rt; 1 min, rt

1.2 Reagents: Cesium carbonate

Solvents: Toluene; rt → 80 °C; 15.5 h, 80 °C

Experimental Protocols

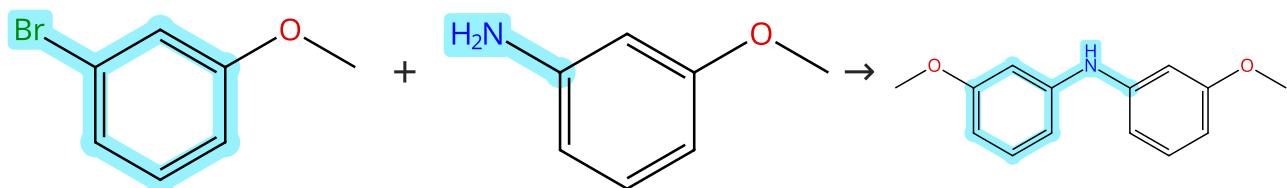
Design, synthesis, and structure-activity relationship of N-aryl naphthylamine derivatives as amyloid aggregation inhibitors

By: Di Santo, Roberto; et al

Journal of Medicinal Chemistry (2012), 55(19), 8538-8548.

Scheme 21 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (91)

Suppliers (76)

Supplier (46)

31-172-CAS-4373660

Steps: 1 Yield: 100%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 2 d, 110 °C

Experimental Protocols

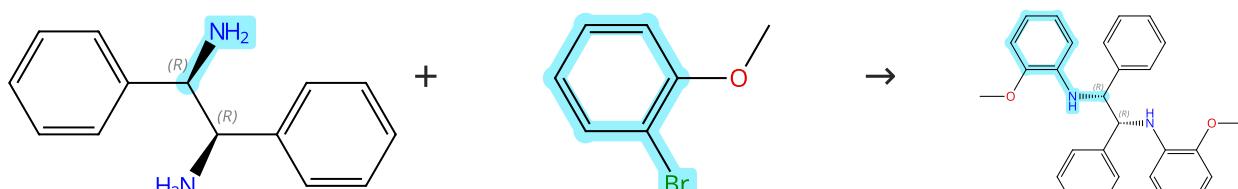
Transition metals in organic synthesis. Part 87. An efficient palladium-catalyzed route to 2-oxygenated and 2,7-dioxygenated carbazole alkaloids - total synthesis of 2-methoxy-3-methylcarbazole, glycosinine, clausine L, mukonidine, and clausine V

By: Forke, Ronny; et al

Synlett (2008), (12), 1870-1876.

Scheme 22 (1 Reaction)

Steps: 1 Yield: 100%

Absolute stereochemistry shown,
Rotation (+)

Suppliers (88)

Absolute stereochemistry shown,
Rotation (-)

Suppliers (112)

31-172-CAS-11690864

Steps: 1 Yield: 100%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; 1 h, rt

1.2 Solvents: Toluene; rt

1.3 30 min, rt

1.4 19 h, 120 °C

Experimental Protocols

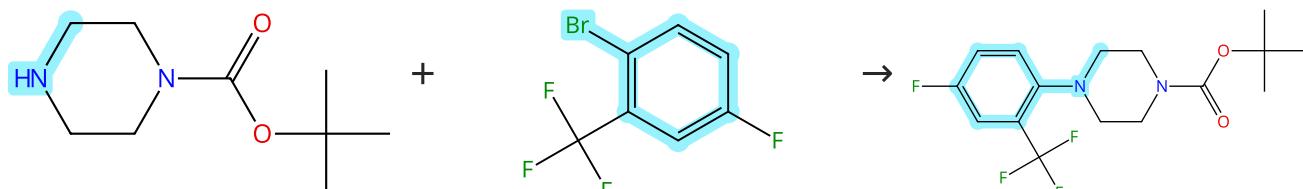
Asymmetric Intramolecular Hydroamination of Allenes using Mononuclear Gold Catalysts

By: Michon, Christophe; et al

Organometallics (2013), 32(19), 5589-5600.

Scheme 23 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (130)

Suppliers (91)

Suppliers (8)

31-172-CAS-6016606

Steps: 1 Yield: 100%

Piperazine Sulfonamides as Potent, Selective, and Orally Available 11 β -Hydroxysteroid Dehydrogenase Type 1 Inhibitors with Efficacy in the Rat Cortisone-Induced Hyperinsulinemia Model1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; 30 min, 110 °C

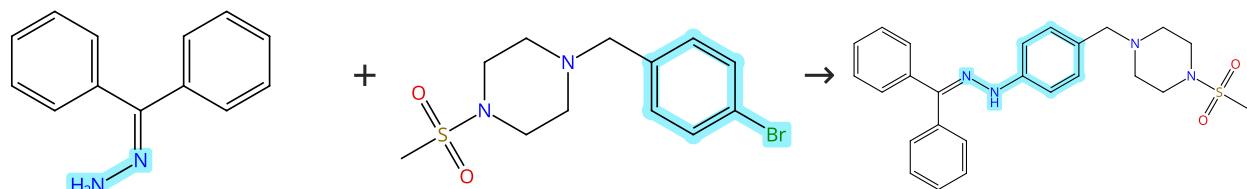
Experimental Protocols

By: Xiang, Jason; et al

Journal of Medicinal Chemistry (2008), 51(14), 4068-4071.

Scheme 24 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (86)

Suppliers (7)

31-172-CAS-15074470

Steps: 1 Yield: 100%

Synthesis of 5-Substituted-1H-indol-2-yl-1H-quinolin-2-ones: A Novel Class of KDR Kinase Inhibitors

1.1 Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 5 min, 105 °C; 105 °C → rt

1.2 Reagents: Sodium *tert*-butoxide; 4 h, 105 °C

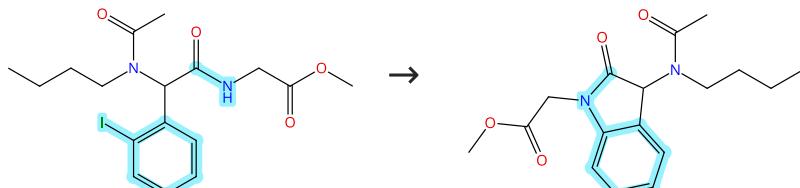
By: Kuethe, Jeffrey T.; et al

Journal of Organic Chemistry (2005), 70(7), 2555-2567.

Experimental Protocols

Scheme 25 (1 Reaction)

Steps: 1 Yield: 100%



Suppliers (2)

31-172-CAS-14780323

Steps: 1 Yield: 100%

1.1 Reagents: Potassium carbonate

Catalysts: Bis(dibenzylideneacetone)palladium, 2-(Dicyclohexylphosphino)-2'-methylbiphenyl

Solvents: Acetonitrile, Toluene; 1 h, 100 °C

Experimental Protocols

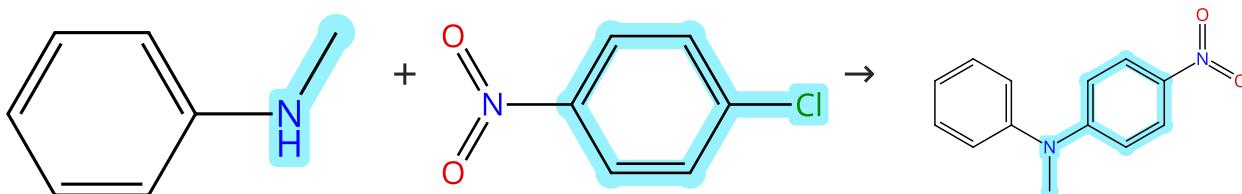
Rapid access to oxindoles by the combined use of an Ugi four-component reaction and a microwave-assisted intramolecular Buchwald-Hartwig amidation reaction

By: Bonnaterre, Florence; et al

Organic Letters (2006), 8(19), 4351-4354.

Scheme 26 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (75)

Suppliers (64)

Suppliers (7)

31-172-CAS-11381062

Steps: 1 Yield: 99%

1.1 Reagents: Potassium hydroxide, Water

Catalysts: Hexadecyltrimethylammonium bromide, Bis(tri-*tert*-butylphosphine)palladium

Solvents: Toluene

Experimental Protocols

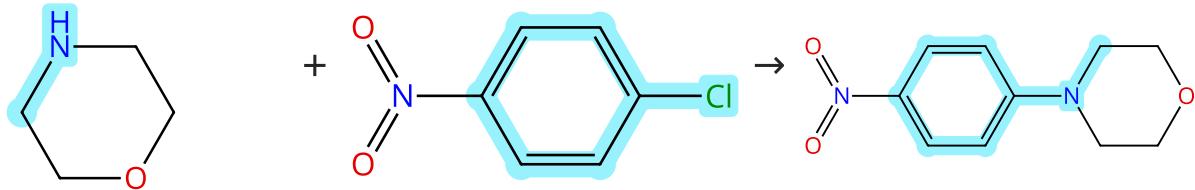
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 27 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (76)

Suppliers (64)

Suppliers (75)

31-172-CAS-12356609

Steps: 1 Yield: 99%

1.1 Reagents: Sodium hydroxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 40 h, 100 °C

Experimental Protocols

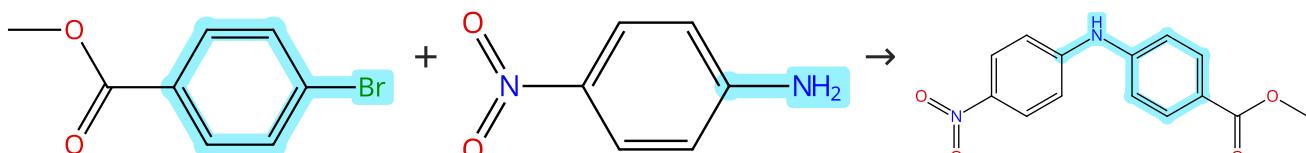
Scope and limitations of $\text{Pd}_2(\text{dba})_3/\text{P}(\text{i-BuNCH}_2\text{CH}_2)_3\text{N}$ -catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Scheme 28 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (100)

Suppliers (94)

Suppliers (2)

31-172-CAS-11377516

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 4 - 48 h, 120 °C

Experimental Protocols

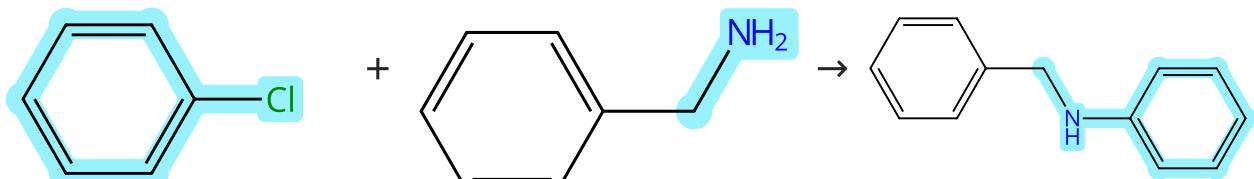
Development of Potent and Selective Inhibitors of Aldo-Keto Reductase 1C3 (Type 5 17 β -Hydroxysteroid Dehydrogenase) Based on N-Phenyl-Aminobenzoates and Their Structure-Activity Relationships

By: Adeniji, Adegoke O.; et al

Journal of Medicinal Chemistry (2012), 55(5), 2311-2323.

Scheme 29 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (136)

Suppliers (82)

Suppliers (88)

31-172-CAS-15341647

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene
Solvents: 1,2-Dimethoxyethane; 48 h, 100 °C

Experimental Protocols

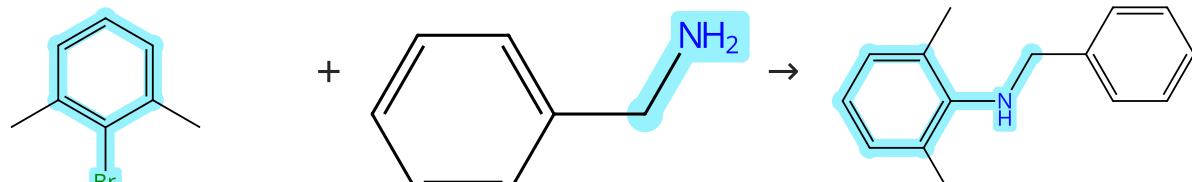
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 30 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (97)

Suppliers (82)

Suppliers (15)

31-172-CAS-4657154

Steps: 1 Yield: 99%

1.1 Reagents: Potassium *tert*-butoxide
Catalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl) phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium
Solvents: 1,2-Dimethoxyethane; 1 min, rt

Experimental Protocols

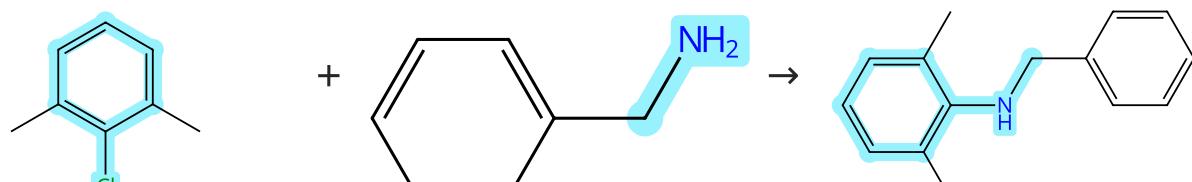
Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 31 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (86)

Suppliers (82)

Suppliers (15)

31-172-CAS-7216957

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: (*SP*-4-4)-[2-[2-(Amino- κ N)ethyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium

Solvents: 1,4-Dioxane; 20 min, rt

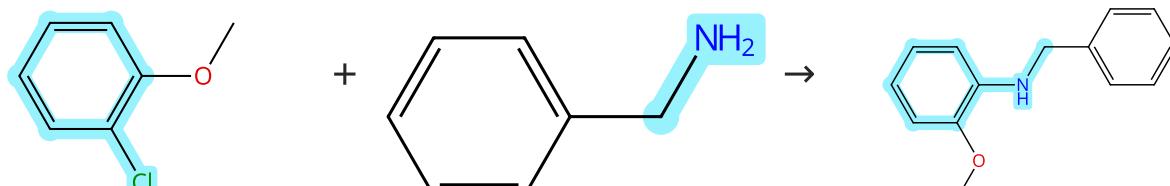
Experimental Protocols

A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

Scheme 32 (1 Reaction)



Suppliers (66)

Suppliers (82)

Suppliers (14)

31-172-CAS-12233478

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 2-(Di-*tert*-butylphosphino)biphenyl

Solvents: Toluene

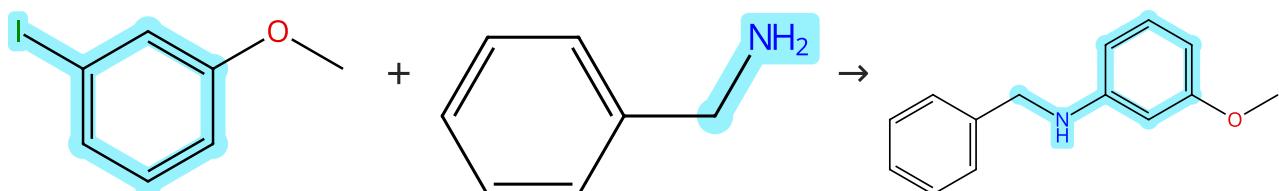
Experimental Protocols

Simple, efficient catalyst system for the palladium-catalyzed amination of aryl chlorides, bromides, and triflates

By: Wolfe, John P.; et al

Journal of Organic Chemistry (2000), 65(4), 1158-1174.

Scheme 33 (1 Reaction)



Suppliers (87)

Suppliers (82)

Suppliers (52)

31-172-CAS-6170686

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 48 h, 100 °C

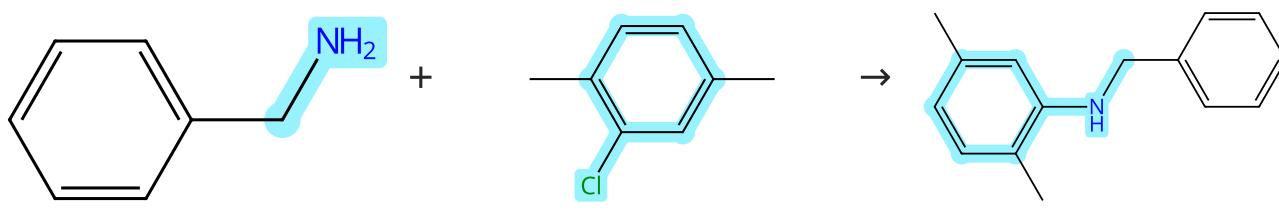
Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 34 (2 Reactions)



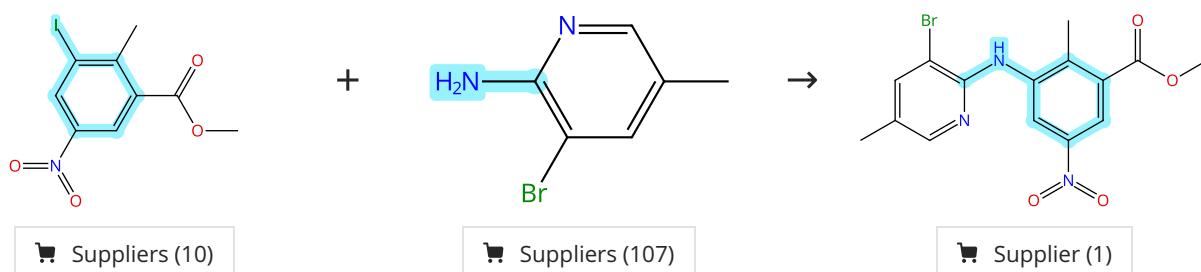
Suppliers (82)

Suppliers (76)

Suppliers (12)

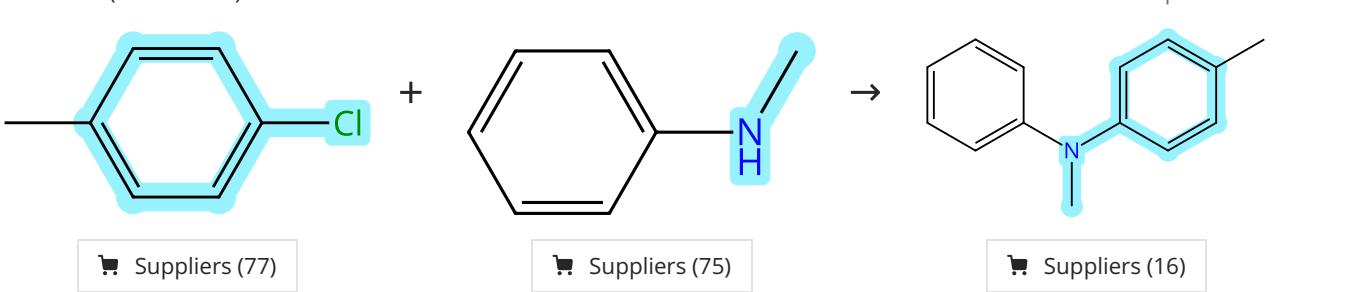
31-172-CAS-11957917	Steps: 1 Yield: 99%	Simple, efficient catalyst system for the palladium-catalyzed amination of aryl chlorides, bromides, and triflates By: Wolfe, John P.; et al Journal of Organic Chemistry (2000), 65(4), 1158-1174.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Palladium diacetate, 2-(Di- <i>tert</i> -butylphosphino)biphenyl Solvents: Toluene Experimental Protocols	Steps: 1 Yield: 97%	Polymer-incarcerated palladium with active phosphine as recoverable and reusable Pd catalyst for the amination of aryl chlorides By: Inasaki, Takeshi; et al Synlett (2007), (20), 3209-3213.

Scheme 35 (1 Reaction)



31-172-CAS-1238906	Steps: 1 Yield: 99%	Integrated Cross-Coupling Strategy for an α -Carboline-Based Aurora B Kinase Inhibitor By: Mineno, Masahiro; et al Journal of Organic Chemistry (2015), 80(3), 1564-1568.
1.1 Reagents: Cesium carbonate Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine] Solvents: Toluene; 5 h, 100 °C Experimental Protocols	Steps: 1 Yield: 99%	

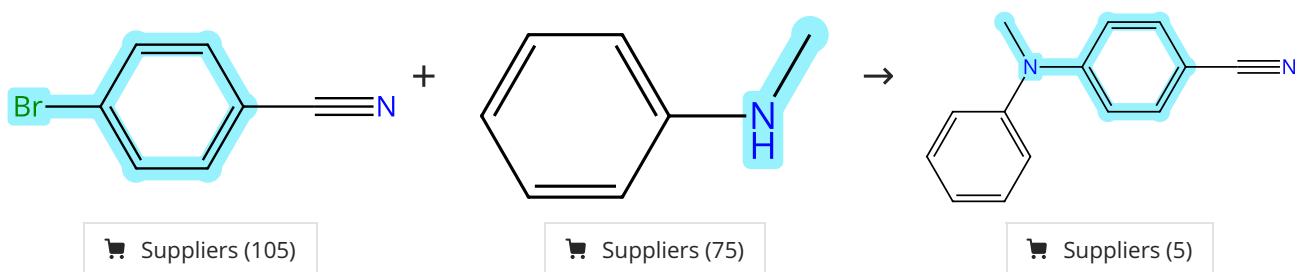
Scheme 36 (5 Reactions)



31-172-CAS-12743282	Steps: 1 Yield: 99%	Buchwald-Hartwig amination of aryl chlorides catalyzed by easily accessible benzimidazolyl phosphine-Pd complexes By: Chung, Kin Ho; et al Synlett (2012), 23(8), 1181-1186.
1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-[2-(Dicyclohexylphosphino)phenyl]-1-methyl-1 <i>H</i> -benzimidazole Solvents: Toluene; rt 1.2 Reagents: Sodium <i>tert</i> -butoxide Solvents: Toluene; > 1 min, rt; 20 h, 135 °C; 135 °C → rt 1.3 Reagents: Water Experimental Protocols	Steps: 1 Yield: 99%	

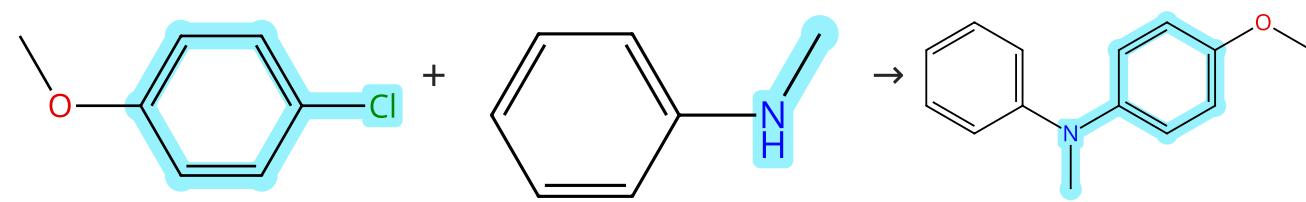
31-172-CAS-7224726	Steps: 1 Yield: 99%	Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides By: Kuwano, Ryoichi; et al Journal of Organic Chemistry (2002), 67(18), 6479-6486.
1.1 Reagents: Potassium hydroxide, Water Catalysts: Hexadecyltrimethylammonium bromide, Bis(<i>tri-tert-butylphosphine</i>)palladium Solvents: Toluene	Experimental Protocols	
31-172-CAS-13136218	Steps: 1 Yield: 99%	Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems By: Grasa, Gabriela A.; et al Journal of Organic Chemistry (2001), 66(23), 7729-7737.
1.1 Reagents: Potassium <i>tert</i> -butoxide Catalysts: Tris(dibenzylideneacetone)dipalladium, 1 <i>H</i> -Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1) Solvents: 1,4-Dioxane	Experimental Protocols	
31-172-CAS-1305646	Steps: 1 Yield: 98%	Simple, efficient catalyst system for the palladium-catalyzed amination of aryl chlorides, bromides, and triflates By: Wolfe, John P.; et al Journal of Organic Chemistry (2000), 65(4), 1158-1174.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Palladium diacetate, 2-(Di- <i>tert</i> -butylphosphino)biphenyl Solvents: Toluene	Experimental Protocols	
31-172-CAS-14320599	Steps: 1 Yield: 95%	N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides By: Huang, Pei; et al Organometallics (2014), 33(7), 1587-1593.
1.1 Reagents: Potassium carbonate Catalysts: (<i>S</i> <i>P</i> -4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2 <i>H</i> -imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium Solvents: 1,4-Dioxane; 1 h, 90 °C	Experimental Protocols	

Scheme 37 (2 Reactions)



31-172-CAS-6870552	Steps: 1 Yield: 99%	Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides By: Hill, Lensey L.; et al Journal of Organic Chemistry (2006), 71(14), 5117-5125.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Tris(dibenzylideneacetone)dipalladium, Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine Solvents: Toluene; 1 - 6 h, rt	Experimental Protocols	
31-172-CAS-6796817	Steps: 1 Yield: 97%	Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions By: Marion, Nicolas; et al Journal of the American Chemical Society (2006), 128(12), 4101-4111.
1.1 Reagents: Potassium <i>tert</i> -butoxide Catalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium Solvents: 1,2-Dimethoxyethane; 15 min, rt	Experimental Protocols	

Scheme 38 (4 Reactions)



Suppliers (79)

Suppliers (75)

Suppliers (23)

Steps: 1 Yield: 95-99%

31-172-CAS-440570

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, Bis(1,1-dimethylallyl)(2,2-dimethylpropyl)phosphine

Solvents: Toluene; 18 h, 100 °C

Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2006), 71(14), 5117-5125.

Experimental Protocols

31-172-CAS-9611959

Steps: 1 Yield: 98%

1.1 Reagents: Sodium hydroxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 40 h, 100 °C

Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols

31-172-CAS-13732030

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylallyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 100 °C

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Experimental Protocols

31-172-CAS-3387461

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 20 h, 100 °C; 100 °C → rt

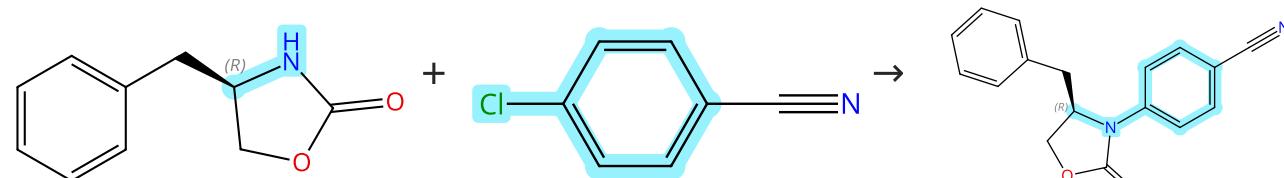
Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols

Scheme 39 (1 Reaction)

Absolute stereochemistry shown,
Rotation (+)

Suppliers (123)

Suppliers (102)

Steps: 1 Yield: 99%

Absolute stereochemistry shown

Suppliers (2)

31-172-CAS-12659897

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl

Solvents: Toluene; 15 h, 115 °C

Experimental Protocols

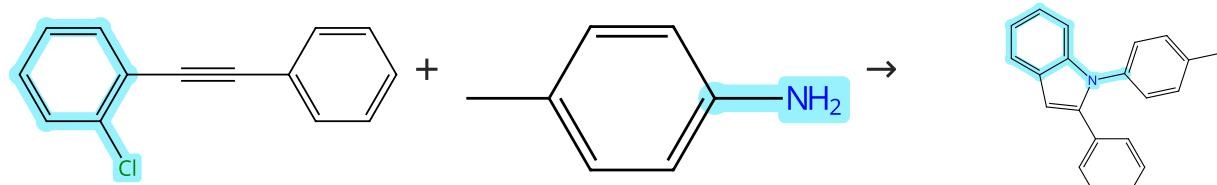
Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Scheme 40 (2 Reactions)

Steps: 1 Yield: 95-99%



Suppliers (8)

Suppliers (78)

Suppliers (4)

31-172-CAS-4508350

Steps: 1 Yield: 99%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Palladium diacetate, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

Solvents: Toluene; 2 h, 105 °C

Experimental Protocols

General and efficient indole syntheses based on catalytic amination reactions

By: Ackermann, Lutz

Organic Letters (2005), 7(3), 439-442.

31-172-CAS-4131399

Steps: 1 Yield: 95%

1.1 Reagents: Tripotassium phosphate

Catalysts: Palladium diacetate, Cuprous iodide, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

Solvents: Toluene; 5 - 18 h, 1 °C

Experimental Protocols

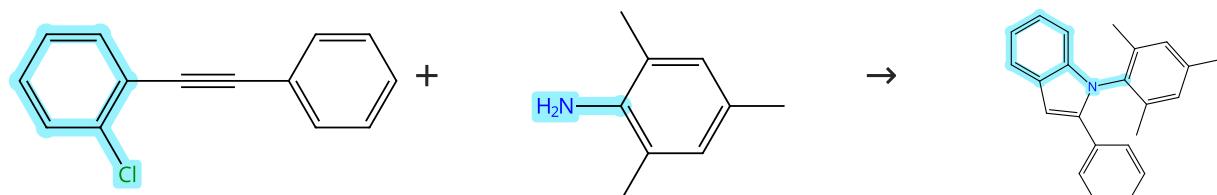
General and efficient indole syntheses based on catalytic amination reactions

By: Ackermann, Lutz

Organic Letters (2005), 7(3), 439-442.

Scheme 41 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (8)

Suppliers (85)

Suppliers (5)

31-172-CAS-8770949

Steps: 1 Yield: 99%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Palladium diacetate, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

Solvents: Toluene; 2 h, 105 °C

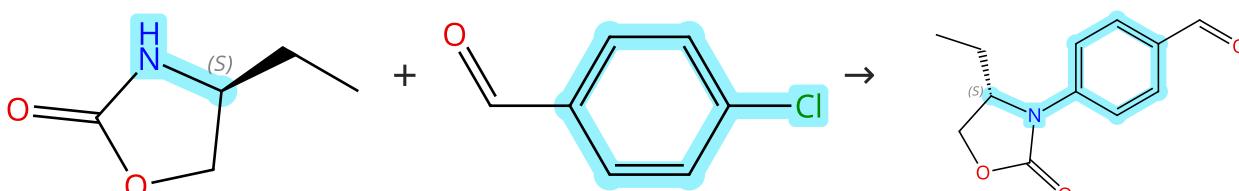
Experimental Protocols

General and efficient indole syntheses based on catalytic amination reactions

By: Ackermann, Lutz

Organic Letters (2005), 7(3), 439-442.

Scheme 42 (1 Reaction)



31-172-CAS-399178

Steps: 1 Yield: 99%

1.1 **Reagents:** Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene; 15 h, 100 °C

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

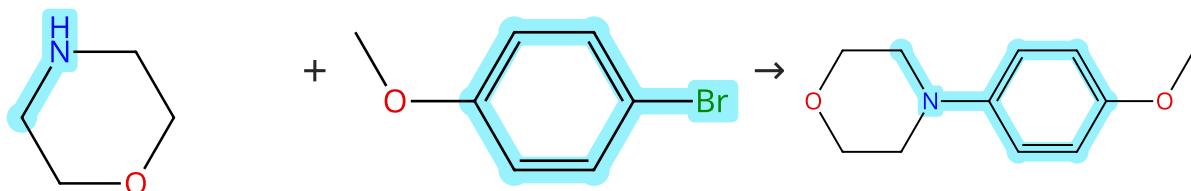
By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Experimental Protocols

Scheme 43 (5 Reactions)

Steps: 1 Yield: 95-99%



31-172-CAS-12377307

Steps: 1 Yield: 99%

1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 1-[2-[Bis(1,1-dimethylethyl)phosphino]phenyl]-3,5-diphenyl-1*H*-pyrazole
Solvents: 2-Methyl-2-butanol; rt

Alternative biarylphosphines for use in the palladium-catalyzed amination of aryl halides

By: Singer, Robert A.; et al

Synthesis (2003), (11), 1727-1731.

1.2 2 - 16 h, 85 °C; 85 °C → rt

1.3 **Reagents:** Water; rt

Experimental Protocols

31-172-CAS-4708225

Steps: 1 Yield: 99%

1.1 **Reagents:** Potassium hydroxide, Water
Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tert*-butylphosphine)palladium
Solvents: Toluene

Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Experimental Protocols

31-172-CAS-3402947

Steps: 1 Yield: 97%

1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine
Solvents: Toluene; 3 - 6 h, 50 °C

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Experimental Protocols

31-172-CAS-1273144

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 50 °C

Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

31-172-CAS-2346170

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

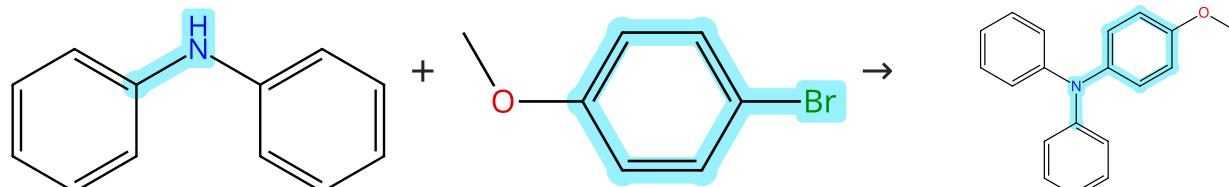
Solvents: Toluene; 9 - 15 h, 80 °C

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 44 (2 Reactions)

Suppliers (108)

Suppliers (79)

Suppliers (49)

31-172-CAS-15363044

Steps: 1 Yield: 99%

Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Experimental Protocols

31-172-CAS-10165160

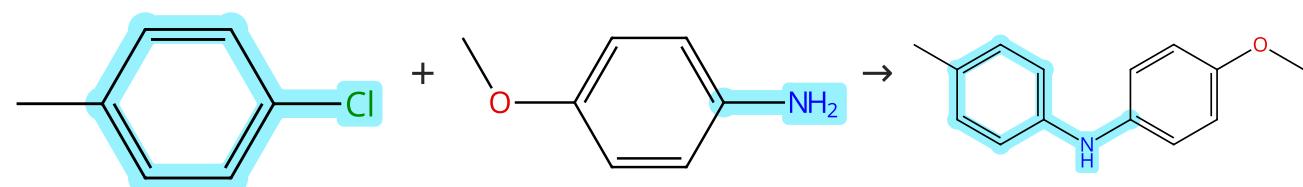
Steps: 1 Yield: 95%

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 45 (2 Reactions)

Suppliers (77)

Suppliers (84)

Suppliers (59)

31-172-CAS-4448549

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 24 h, 100 °C

Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

31-172-CAS-10731189

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 80 °C

Experimental Protocols

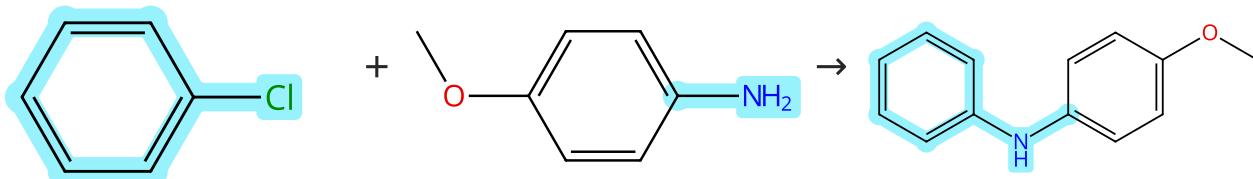
P[N(i-Bu)CH₂CH₂]₃N: A Versatile Ligand for the Pd-Catalyzed Amination of Aryl Chlorides

By: Urgaonkar, Sameer; et al

Organic Letters (2003), 5(6), 815-818.

Scheme 46 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (136)

Suppliers (84)

Suppliers (76)

31-172-CAS-12857387

Steps: 1 Yield: 99%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole-κ*N*³)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

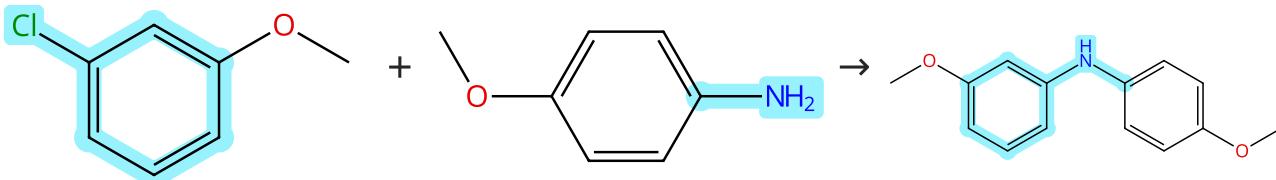
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 47 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (82)

Suppliers (84)

Suppliers (40)

31-172-CAS-8709525

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 24 h, 100 °C

Experimental Protocols

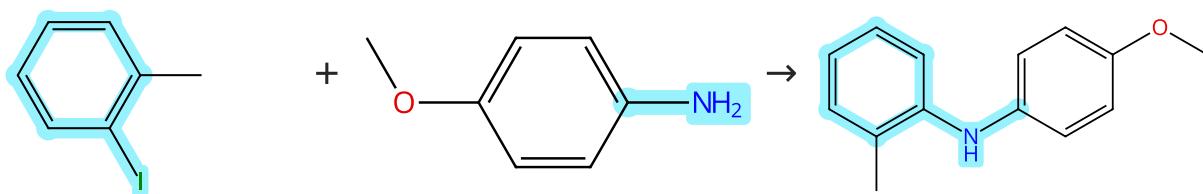
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 48 (2 Reactions)

Steps: 1 Yield: 95-99%



Suppliers (85)

Suppliers (84)

Suppliers (15)

31-172-CAS-14328310

Steps: 1 Yield: 99%

1.1 Reagents:

Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene

An Improved Method for the Palladium-Catalyzed Amination of Aryl Iodides

By: Ali, Mayssam H.; et al

Journal of Organic Chemistry (2001), 66(8), 2560-2565.

Experimental Protocols

31-172-CAS-3750325

Steps: 1 Yield: 95%

1.1 Reagents:

Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 12 h, 80 °C

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

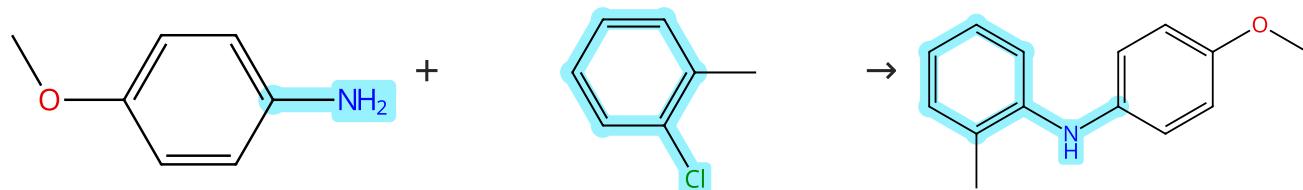
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 49 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (84)

Suppliers (70)

Suppliers (15)

31-172-CAS-565407

Steps: 1 Yield: 99%

Scope and limitations of *Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N*-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols

Scheme 50 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (107)

Suppliers (53)

Suppliers (2)

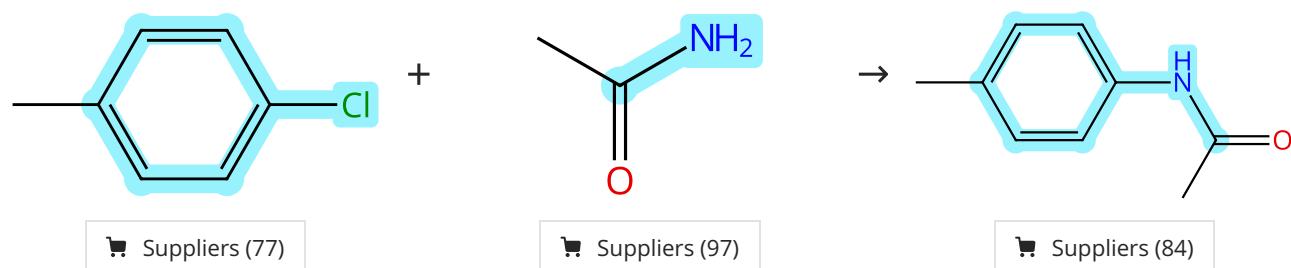
31-172-CAS-2570193

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Lithium bis(trimethylsilyl)amide
Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium
Solvents: Tetrahydrofuran; 4 h, 80 °C; 80 °C → rt
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Water; rt
- 1.3 **Reagents:** Sodium bicarbonate
Solvents: Ethyl acetate, Water; rt

Experimental Protocols

Scheme 51 (1 Reaction)



31-172-CAS-6571440

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Tripotassium phosphate
Catalysts: Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine
Solvents: *tert*-Butanol; 12 h, 110 °C

Experimental Protocols

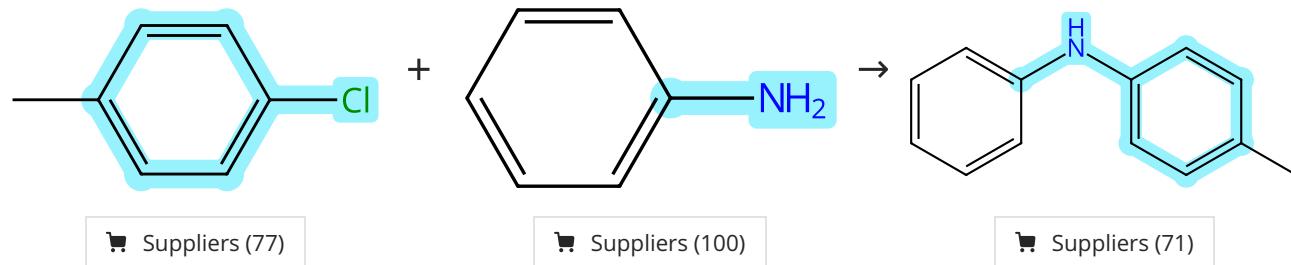
Efficient Pd-catalyzed amination reactions for heterocycle functionalization

By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Scheme 52 (4 Reactions)

Steps: 1 Yield: 96-99%



31-172-CAS-1774494

Steps: 1 Yield: 99%

- 1.1 **Catalysts:** Tris(dibenzylideneacetone)dipalladium, 2-[2-(Dicyclohexylphosphino)phenyl]-1-methyl-1*H*-benzimidazole
Solvents: Toluene; rt
- 1.2 **Reagents:** Sodium *tert*-butoxide
Solvents: Toluene; > 1 min, rt; 20 h, 135 °C; 135 °C → rt
- 1.3 **Reagents:** Water

Experimental Protocols

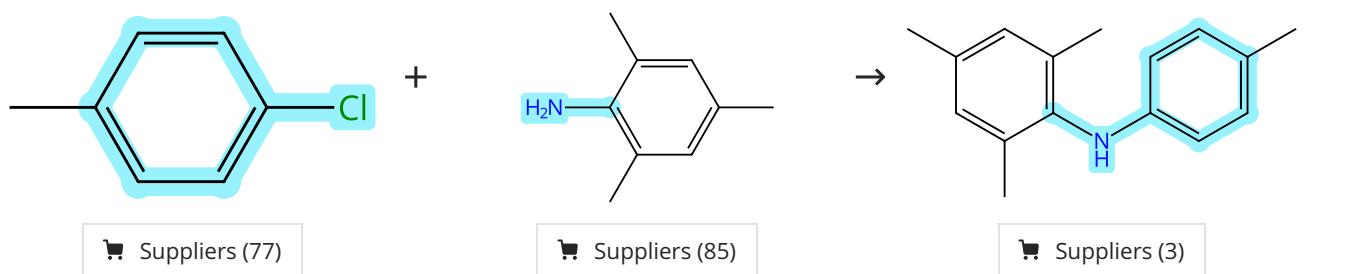
Buchwald-Hartwig amination of aryl chlorides catalyzed by easily accessible benzimidazolyl phosphine-Pd complexes

By: Chung, Kin Ho; et al

Synlett (2012), 23(8), 1181-1186.

31-172-CAS-7574347	Steps: 1 Yield: 97%	Polymer-incarcerated palladium with active phosphine as recoverable and reusable Pd catalyst for the amination of aryl chlorides By: Inasaki, Takeshi; et al Synlett (2007), (20), 3209-3213.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Palladium Solvents: Toluene; 8 h, 110 °C	Experimental Protocols	
31-172-CAS-2029648	Steps: 1 Yield: 96%	N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides By: Huang, Pei; et al Organometallics (2014), 33(7), 1587-1593.
1.1 Reagents: Potassium carbonate Catalysts: (<i>SP</i> -4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2 <i>H</i> -imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^{β})palladium Solvents: 1,4-Dioxane; 1 h, 90 °C	Experimental Protocols	
31-172-CAS-9051453	Steps: 1 Yield: 96%	Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems By: Grasa, Gabriela A.; et al Journal of Organic Chemistry (2001), 66(23), 7729-7737.
1.1 Reagents: Potassium <i>tert</i> -butoxide Catalysts: Tris(dibenzylideneacetone)dipalladium, 1 <i>H</i> -Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1) Solvents: 1,4-Dioxane	Experimental Protocols	

Scheme 53 (1 Reaction)



31-172-CAS-10068176

Steps: 1 Yield: 99%

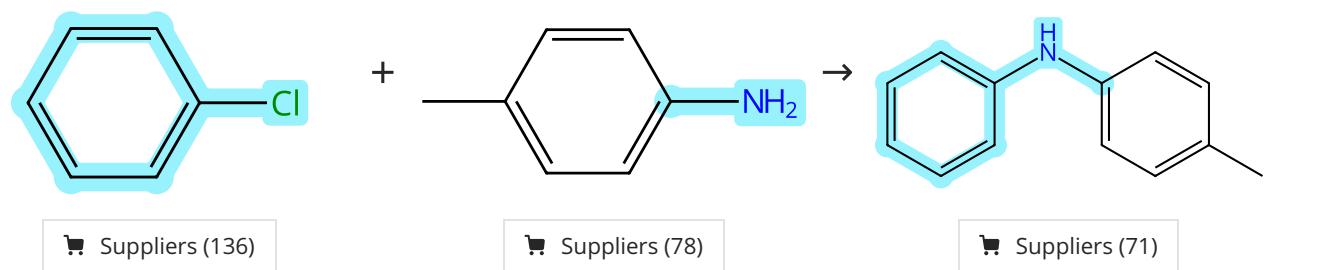
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

Scheme 54 (1 Reaction)



31-172-CAS-11433095

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

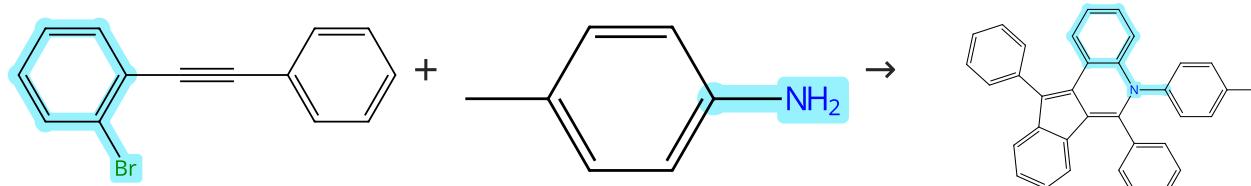
Solvents: 1,2-Dimethoxyethane; 24 h, 100 °C

Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 55 (1 Reaction)

Suppliers (50)

Suppliers (78)

31-172-CAS-9536231

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tricyclohexylphosphine, Palladium diacetate

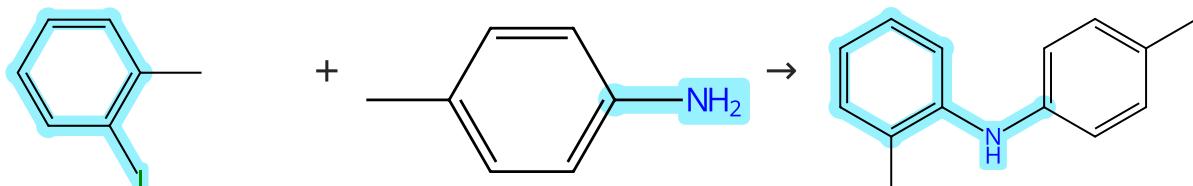
Solvents: 1,4-Dioxane; reflux

Experimental Protocols

Efficient Synthesis of 5H-Cyclopenta[c]quinoline Derivatives via Palladium-Catalyzed Domino Reactions of o-Alkynylhobenzenes with Amine

By: Luo, Yong; et al

Organic Letters (2011), 13(5), 1150-1153.

Scheme 56 (1 Reaction)

Suppliers (85)

Suppliers (78)

Suppliers (7)

31-172-CAS-6860518

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

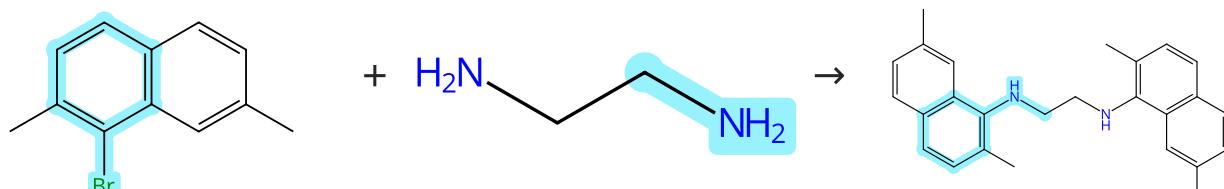
Solvents: 1,2-Dimethoxyethane; 24 h, 100 °C

Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 57 (1 Reaction)

Suppliers (10)

Suppliers (84)

31-172-CAS-10561952

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; 16 h, 100 °C

Experimental Protocols

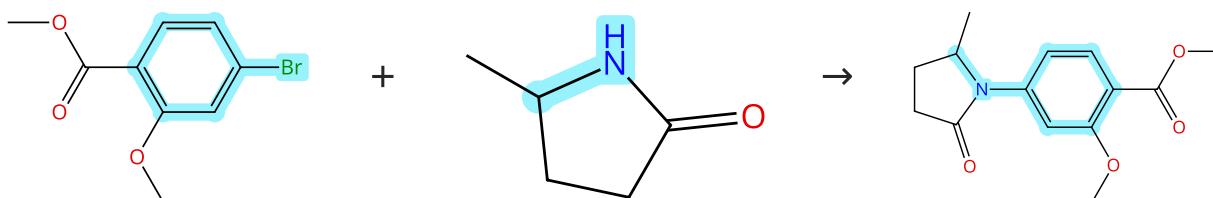
Identification and Characterization of a New Family of Catalystically Highly Active Imidazolin-2-ylidenes

By: Luan, Xinjun; et al

Journal of the American Chemical Society (2008), 130(21), 6848-6858.

Scheme 58 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (81)

Suppliers (63)

Supplier (1)

31-172-CAS-8733304

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9-*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 5 min, rt; overnight, 100 °C

Experimental Protocols

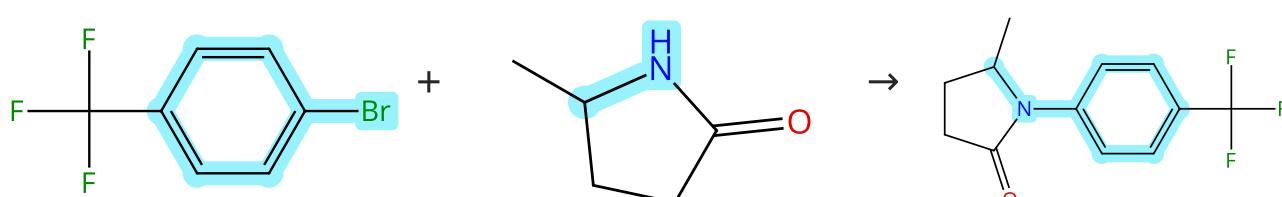
Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Scheme 59 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (90)

Suppliers (63)

Supplier (2)

31-172-CAS-4467987

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9-*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 5 min, rt; overnight, 100 °C

Experimental Protocols

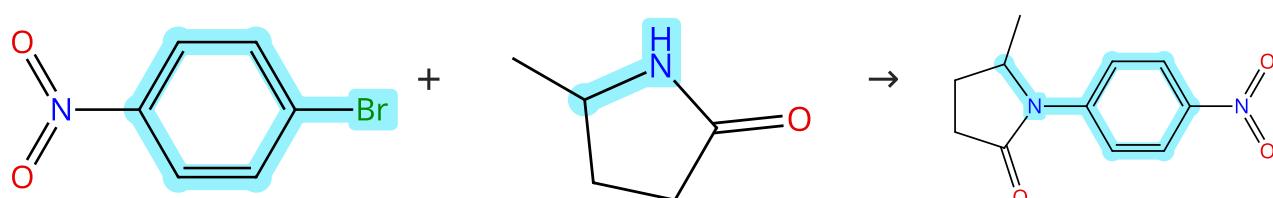
Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Scheme 60 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (84)

Suppliers (63)

Supplier (2)

31-172-CAS-8457402

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 5 min, rt; overnight, 100 °C

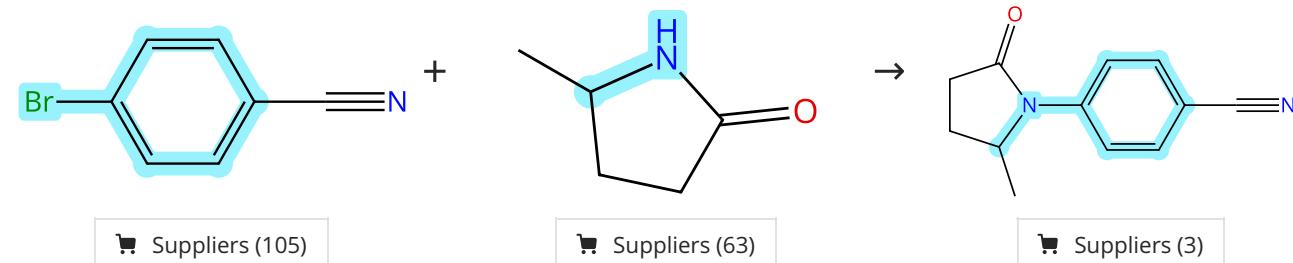
Experimental Protocols

Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Scheme 61 (1 Reaction)



31-172-CAS-6604782

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 5 min, rt; overnight, 100 °C

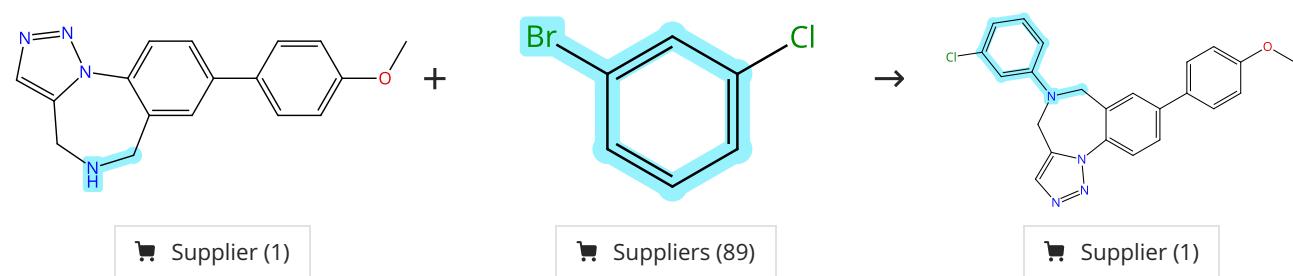
Experimental Protocols

Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Scheme 62 (1 Reaction)



31-172-CAS-5435196

Steps: 1 Yield: 99%

1.1 Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 1 min, rt1.2 Reagents: Sodium *tert*-butoxide; 80 °C

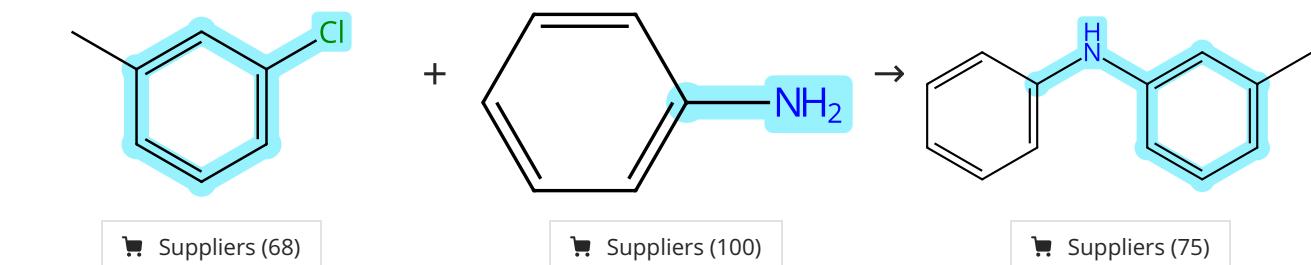
Experimental Protocols

Application of a Sequential Multicomponent Assembly Process/Huisgen Cycloaddition Strategy to the Preparation of Libraries of 1,2,3-Triazole-Fused 1,4-Benzodiazepines

By: Donald, James R.; et al

ACS Combinatorial Science (2012), 14(2), 135-143.

Scheme 63 (1 Reaction)



31-172-CAS-15133362

Steps: 1 Yield: 99%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

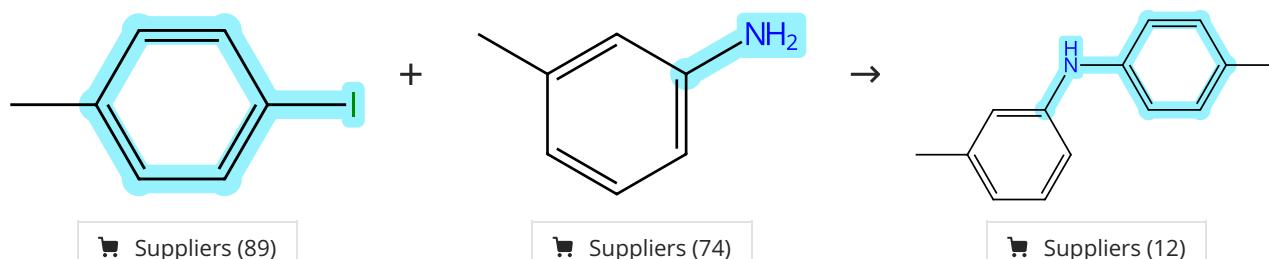
Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 64 (1 Reaction)

31-172-CAS-10068500

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

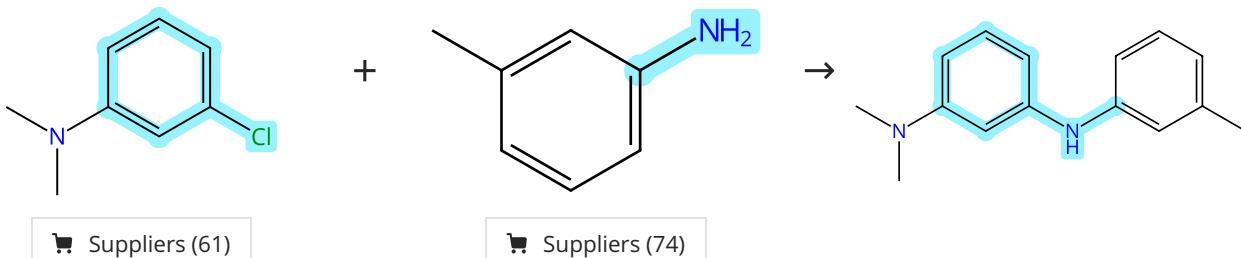
Solvents: Toluene

Experimental Protocols

An Improved Method for the Palladium-Catalyzed Amination of Aryl Iodides

By: Ali, Mayssam H.; et al

Journal of Organic Chemistry (2001), 66(8), 2560-2565.

Scheme 65 (1 Reaction)

31-172-CAS-12464257

Steps: 1 Yield: 99%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

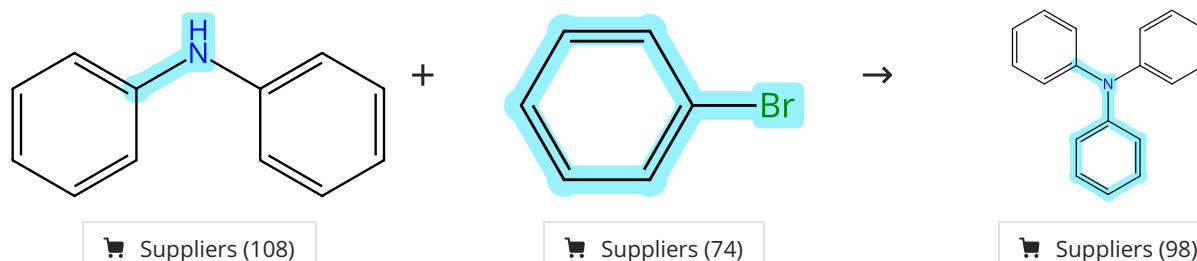
Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

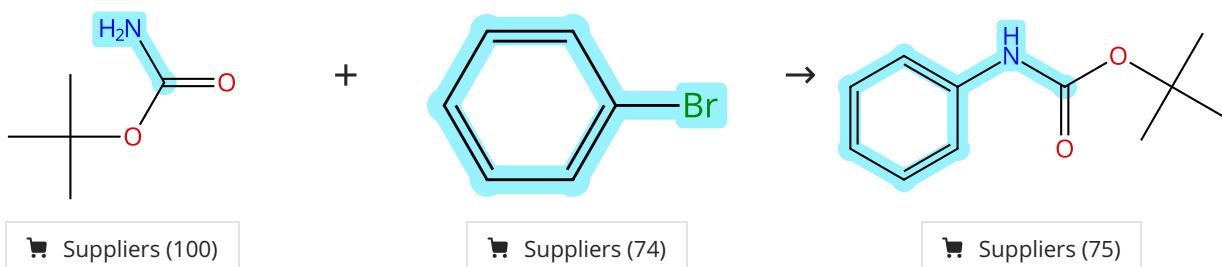
Organometallics (2014), 33(7), 1587-1593.

Scheme 66 (2 Reactions)

31-172-CAS-7261354	Steps: 1 Yield: 99%	Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings By: Kataoka, Noriyasu; et al Journal of Organic Chemistry (2002), 67(16), 5553-5566.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene Solvents: Toluene	Experimental Protocols	

31-172-CAS-5814659	Steps: 1 Yield: 96%	Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides By: Kuwano, Ryoichi; et al Journal of Organic Chemistry (2002), 67(18), 6479-6486.
1.1 Reagents: Potassium hydroxide, Water Catalysts: Hexadecyltrimethylammonium bromide, Bis(<i>tert</i> -butylphosphine)palladium Solvents: Toluene	Experimental Protocols	

Scheme 67 (1 Reaction)



31-172-CAS-11481017

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate
Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine
Solvents: *tert*-Butanol; 20 h, 100 °C; 100 °C → rt

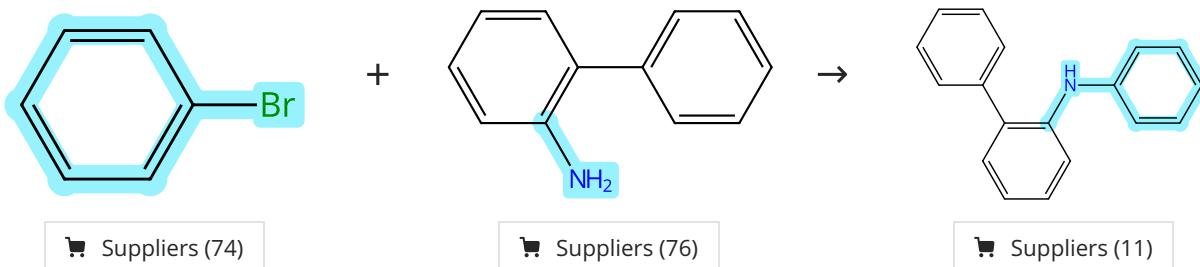
Palladium-catalyzed amidation of aryl halides using 2-dialkylphosphino-2'-alkoxyl-1,1'-binaphthyl as ligands

By: Ma, Fangfang; et al

Journal of Organic Chemistry (2012), 77(12), 5279-5285.

Experimental Protocols

Scheme 68 (1 Reaction)



31-172-CAS-9949575

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; 90 - 110 °C

Anionic N-Fries Rearrangement of N-Carbamoyl Diarylamines to Anthranilamides. Methodology and Application to Acridone and Pyranoacridone Alkaloids

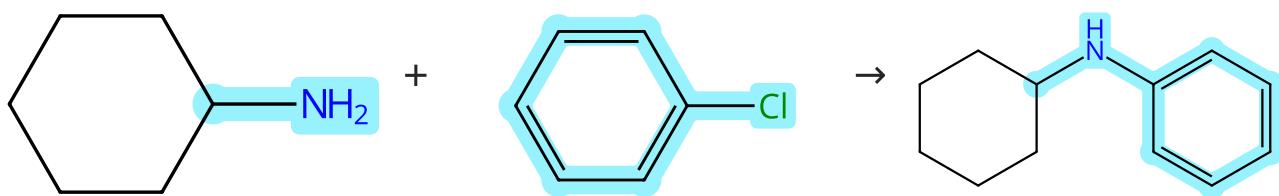
By: MacNeil, Stephen L.; et al

Organic Letters (2006), 8(6), 1133-1136.

Experimental Protocols

Scheme 69 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (79)

Suppliers (136)

Suppliers (75)

31-172-CAS-11087917

Steps: 1 Yield: 99%

- 1.1 Reagents: Sodium *tert*-butoxide
 Catalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene
 Solvents: 1,2-Dimethoxyethane; 36 h, 100 °C

Experimental Protocols

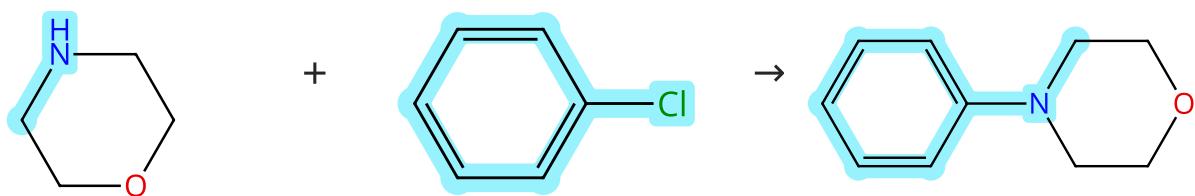
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 70 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (76)

Suppliers (136)

Suppliers (82)

31-172-CAS-7871347

Steps: 1 Yield: 99%

- 1.1 Reagents: Potassium *tert*-butoxide
 Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium
 Solvents: 1,4-Dioxane; 12 h, 90 °C

Experimental Protocols

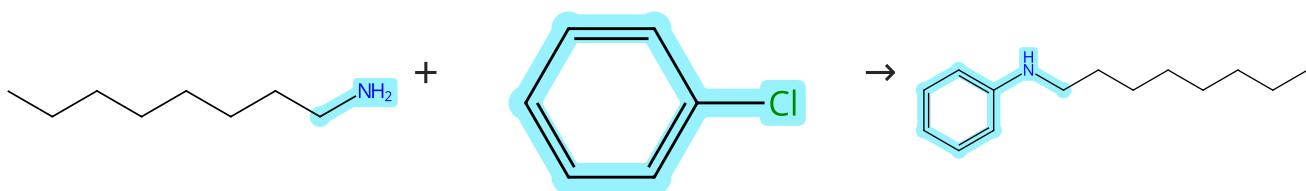
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 71 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (77)

Suppliers (136)

Suppliers (43)

31-172-CAS-1936183

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: Toluene; 24 h, 100 °C

Experimental Protocols

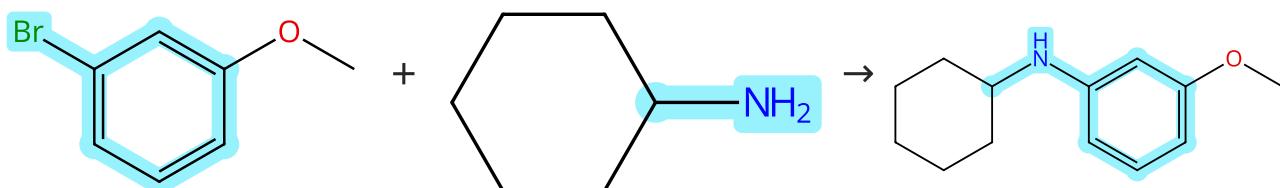
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 72 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (91)

Suppliers (79)

Suppliers (14)

31-172-CAS-8294328

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 36 h, 100 °C

Experimental Protocols

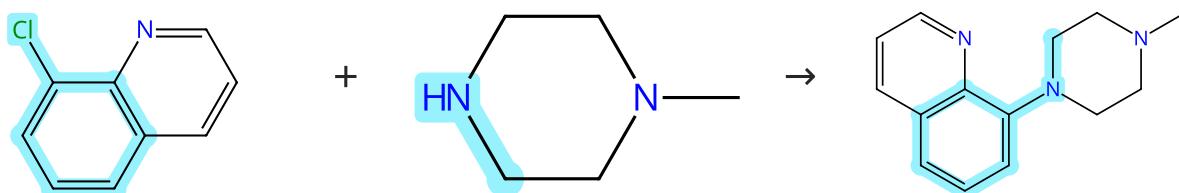
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 73 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (94)

Suppliers (106)

Suppliers (4)

31-172-CAS-10846203

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Toluene; overnight, rt → 110 °C

Experimental Protocols

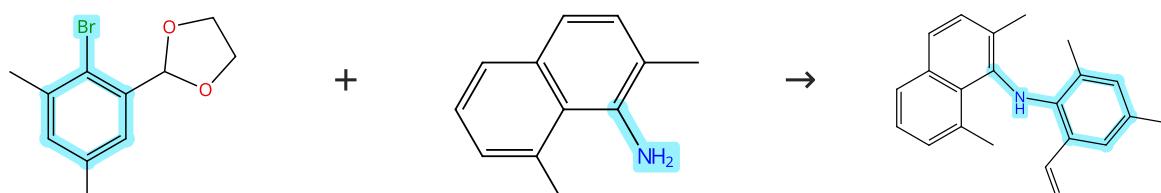
Syntheses, Radiolabelings, and *in Vitro* Evaluations of Fluorinated PET Radioligands of 5-HT₆ Serotonergic Receptors

By: Colomb, Julie; et al

Journal of Medicinal Chemistry (2014), 57(9), 3884-3890.

Scheme 74 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (3)

Suppliers (3)

Supplier (1)

31-006-CAS-9869138

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, Tri-*tert*-butylphosphonium tetrafluoroborate
Solvents: Toluene; rt; 19 h, 60 °C; 60 °C → rt
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Tetrahydrofuran, Water; 5 h, reflux
- 1.3 **Reagents:** Sodium bicarbonate
Solvents: Water; pH 8

Experimental Protocols

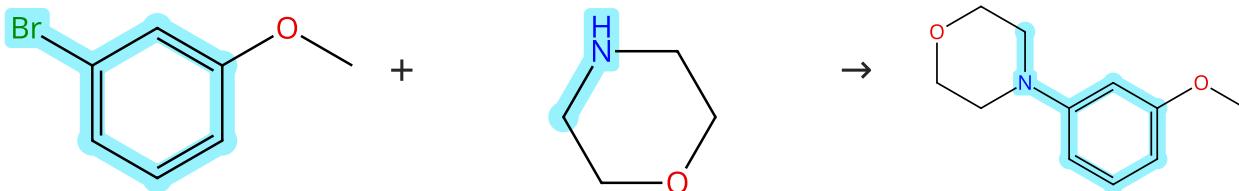
Axially Chiral Binaphthyl Surrogates with an Inner N-H-N Hydrogen Bond

By: Kawabata, Takeo; et al

Journal of the American Chemical Society (2009), 131(1), 54-55.

Scheme 75 (2 Reactions)

Steps: 1 Yield: 96-99%



Suppliers (91)

Suppliers (76)

Suppliers (14)

31-172-CAS-7453045

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: (*SP*-4-4)-[2-[2-(Amino- κ N)ethyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium
Solvents: 1,4-Dioxane; 10 min, 100 °C

Experimental Protocols

A Multiligand Based Pd Catalyst for C-N Cross-Coupling Reactions

By: Fors, Brett P.; et al

Journal of the American Chemical Society (2010), 132(45), 15914-15917.

31-172-CAS-13333744

Steps: 1 Yield: 96%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Bis(dibenzylideneacetone)palladium, 1'-(Bis(1,1-dimethylethyl)phosphino)-1,2,3,4,5-pentaphenylferrocene
Solvents: Toluene

Experimental Protocols

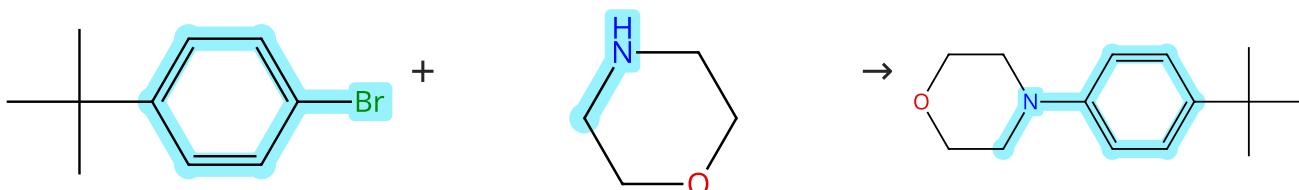
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 76 (2 Reactions)

Steps: 1 Yield: 99%



Suppliers (90)

Suppliers (76)

Suppliers (5)

31-172-CAS-1031560

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane
Solvents: Toluene; 9 - 12 h, 80 °C

Experimental Protocols

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

31-172-CAS-4237375

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1-[2-[Bis(1-methylethyl)phosphino]phenyl]-3,5-diphenyl-1*H*-pyrazole

Solvents: Toluene; rt

1.2 2 - 16 h, 85 °C; 85 °C → rt

1.3 Reagents: Water; rt

Experimental Protocols

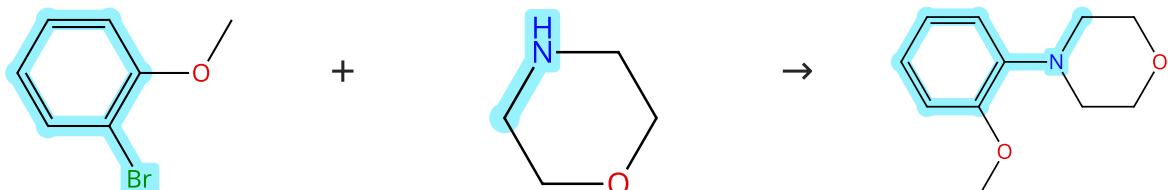
Alternative biarylphosphines for use in the palladium-catalyzed amination of aryl halides

By: Singer, Robert A.; et al

Synthesis (2003), (11), 1727-1731.

Scheme 77 (2 Reactions)

Steps: 1 Yield: 96-99%



Suppliers (88)

Suppliers (76)

Suppliers (31)

31-172-CAS-11362673

Steps: 1 Yield: 99%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 10 h, rt

Experimental Protocols

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

31-172-CAS-12416530

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: (*SP*-4-2)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chloro(2,4-pentanedionato- κ^2O^2,κ^4O^4)palladium

Solvents: 1,2-Dimethoxyethane; 4 h, rt

Experimental Protocols

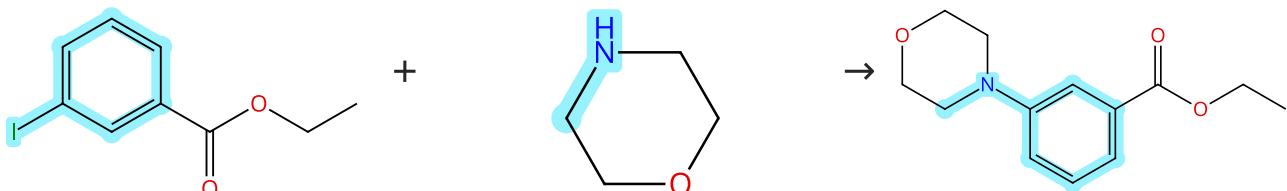
(IPr)Pd(acac)Cl: An Easily Synthesized, Efficient, and Versatile Precatalyst for C-N and C-C Bond Formation

By: Marion, Nicolas; et al

Journal of Organic Chemistry (2006), 71(10), 3816-3821.

Scheme 78 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (84)

Suppliers (76)

Suppliers (23)

31-172-CAS-4041863

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; rt; 17 h, reflux

Experimental Protocols

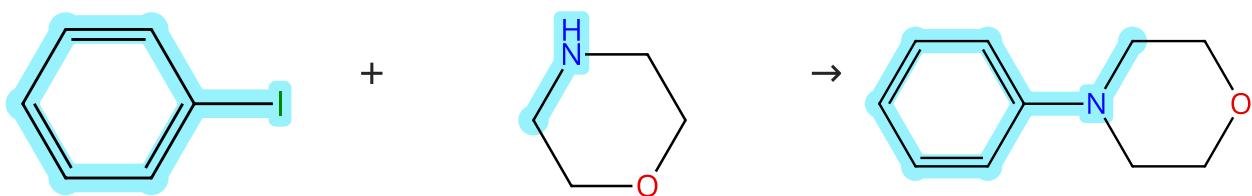
Study of a New Rate Increasing "Base Effect" in the Palladium-Catalyzed Amination of Aryl Iodides

By: Meyers, Caroline; et al

Journal of Organic Chemistry (2004), 69(18), 6010-6017.

Scheme 79 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (101)

Suppliers (76)

Suppliers (82)

31-172-CAS-843524

Steps: 1 Yield: 99%

1.1 Reagents:

Sodium *tert*-butoxide
 Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Nethyl)phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium
 Solvents: Toluene; rt; 24 h, rt \rightarrow 85 °C

An Efficient Process for Pd-Catalyzed C-N Cross-Coupling Reactions of Aryl Iodides: Insight Into Controlling Factors

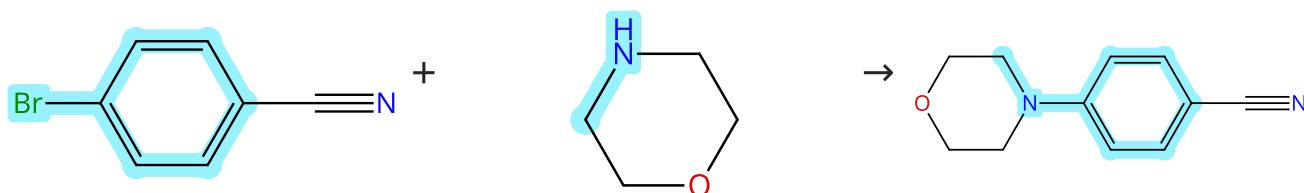
By: Fors, Brett P.; et al

Journal of the American Chemical Society (2009), 131(16), 5766-5768.

Experimental Protocols

Scheme 80 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (105)

Suppliers (76)

Suppliers (78)

31-172-CAS-8892723

Steps: 1 Yield: 99%

1.1 Reagents:

Sodium *tert*-butoxide
 Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane
 Solvents: Toluene; 9 - 15 h, 80 °C

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

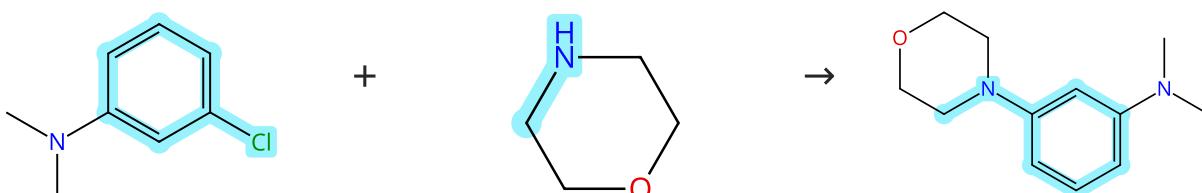
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 81 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (61)

Suppliers (76)

Suppliers (5)

31-172-CAS-12411043

Steps: 1 Yield: 99%

1.1 Reagents:

Potassium carbonate
 Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κ B³)palladium
 Solvents: 1,4-Dioxane; 1 h, 90 °C

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

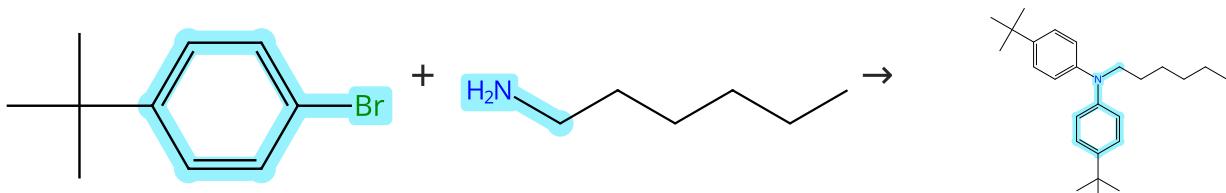
By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

Scheme 82 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (90)

Suppliers (69)

31-172-CAS-1260352

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

Experimental Protocols

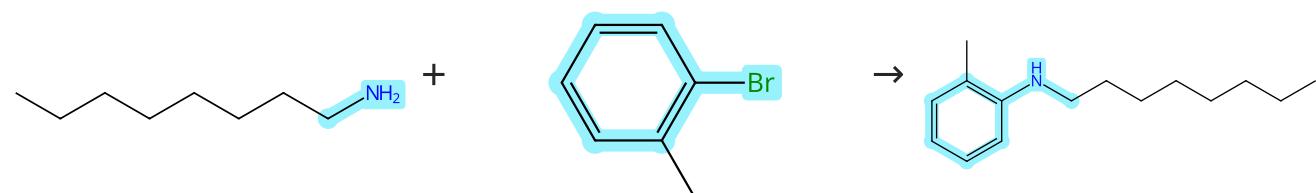
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 83 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (77)

Suppliers (65)

Suppliers (4)

31-172-CAS-6209140

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[*(1R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 36 h, 100 °C

Experimental Protocols

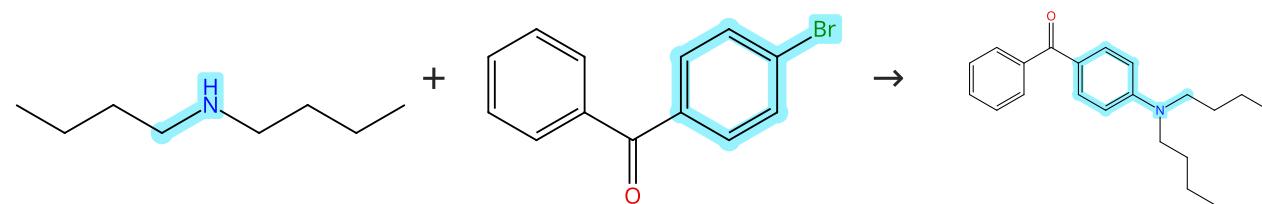
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 84 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (63)

Suppliers (86)

Suppliers (2)

31-172-CAS-13285594

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

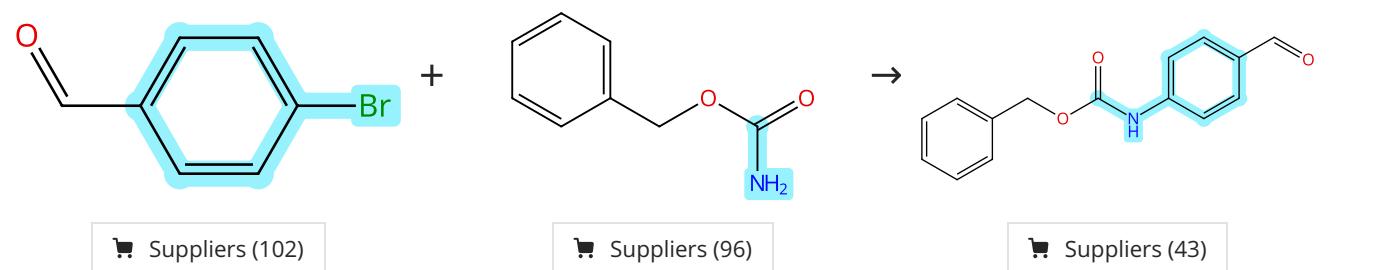
Solvents: Toluene

Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 85 (1 Reaction)

31-172-CAS-974562

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

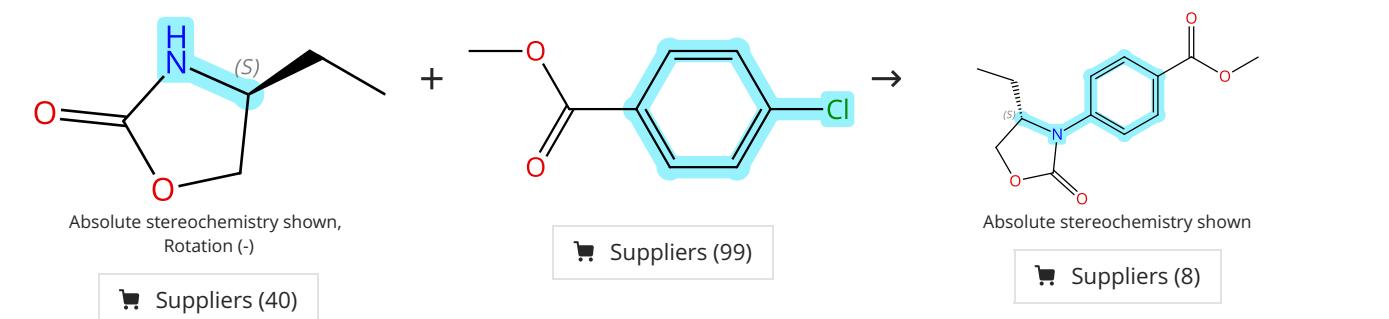
Solvents: Tetrahydrofuran

Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Experimental Protocols

Scheme 86 (1 Reaction)

31-172-CAS-15005564

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl

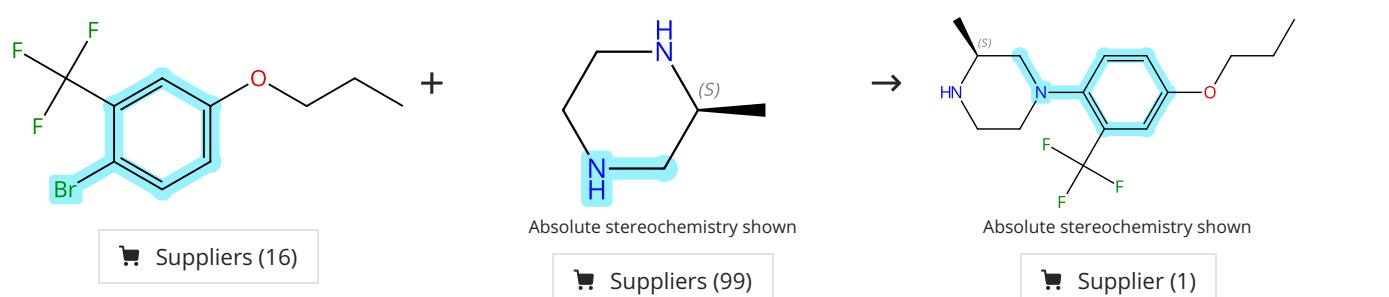
Solvents: Toluene; 17 h, 100 °C

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Experimental Protocols

Scheme 87 (1 Reaction)

31-172-CAS-13518280

Steps: 1 Yield: 99%

Piperazine Oxadiazole Inhibitors of Acetyl-CoA Carboxylase

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; 5 min, rt → 100 °C; 100 °C → 20 °C

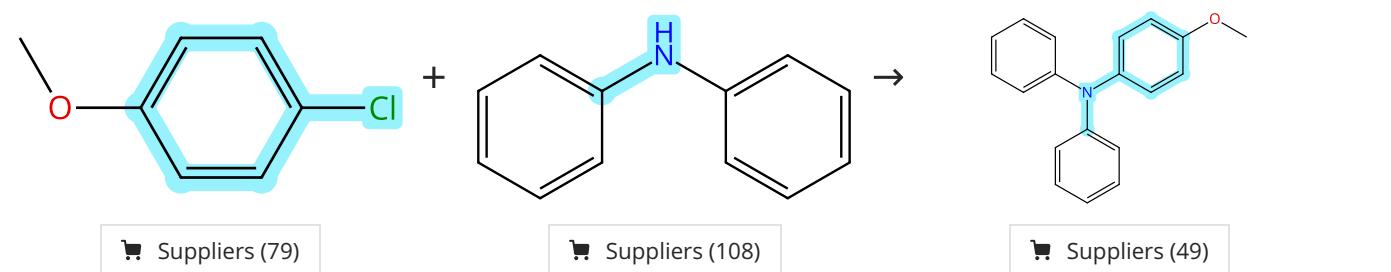
1.2 Reagents: Sodium *tert*-butoxide; 12 h, 20 °C → 100 °C

By: Bourbeau, Matthew P.; et al

Journal of Medicinal Chemistry (2013), 56(24), 10132-10141.

Experimental Protocols

Scheme 88 (1 Reaction)



31-172-CAS-7603433

Steps: 1 Yield: 99%

1.1 **Reagents:** Sodium *tert*-butoxide**Catalysts:** Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene**Solvents:** Toluene

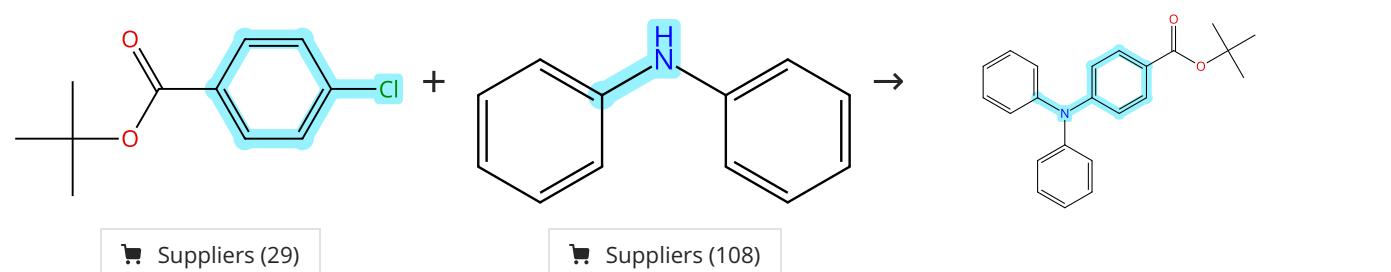
Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 89 (1 Reaction)



31-172-CAS-8939026

Steps: 1 Yield: 99%

1.1 **Reagents:** Potassium hydroxide, Water**Catalysts:** Hexadecyltrimethylammonium bromide, Bis(*tert*-butylphosphine)palladium**Solvents:** Toluene

Experimental Protocols

Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 90 (1 Reaction)



31-172-CAS-583758

Steps: 1 Yield: 99%

1.1 **Reagents:** Sodium *tert*-butoxide**Catalysts:** Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene**Solvents:** Toluene

Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 91 (2 Reactions)

Suppliers (108)

Suppliers (70)

Suppliers (6)

31-172-CAS-12450251

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(diphenylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane
Solvents: Toluene; 20 h, 100 °C; 100 °C → rt

Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols**31-172-CAS-4874501**

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Bis(diphenylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene
Solvents: Toluene

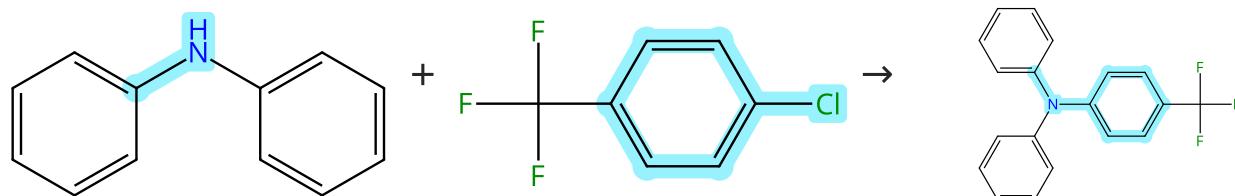
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Experimental Protocols**Scheme 92 (1 Reaction)**

Steps: 1 Yield: 99%



Suppliers (108)

Suppliers (79)

Suppliers (4)

31-172-CAS-3140687

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(diphenylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane
Solvents: Toluene; 20 h, 100 °C; 100 °C → rt

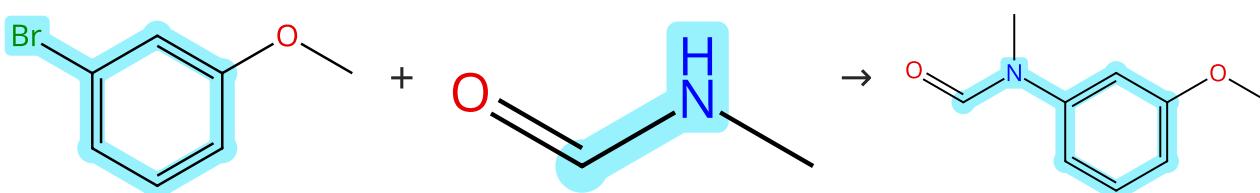
Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols**Scheme 93 (1 Reaction)**

Steps: 1 Yield: 99%



Suppliers (91)

Suppliers (75)

Suppliers (6)

31-172-CAS-1849966

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Catalysts: Palladium diacetate
Solvents: 1,4-Dioxane

Experimental Protocols

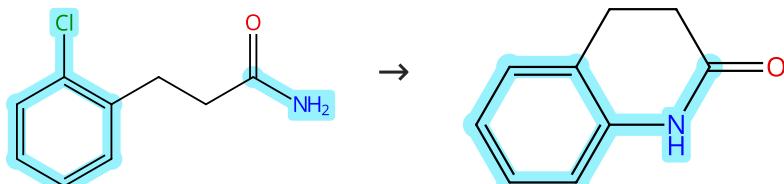
Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

Scheme 94 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (15)

Suppliers (97)

31-172-CAS-2609702

Steps: 1 Yield: 99%

1.1 Catalysts: Palladium diacetate, X-Phos
Solvents: Methanol, *tert*-Butanol; 15 min, rt
1.2 Reagents: Tripotassium phosphate; 15 min, rt; 16 h, 100 °C

Experimental Protocols

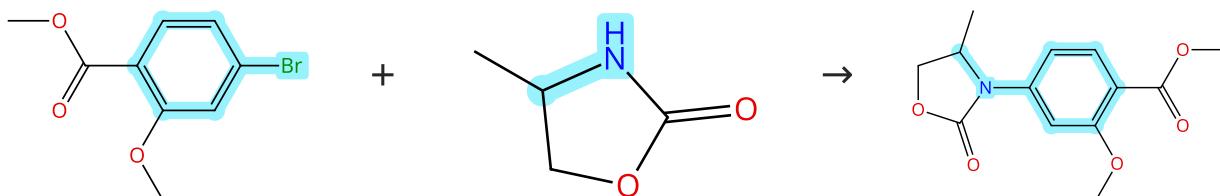
Multicomponent multicatalyst reactions (MC)²R: One-pot synthesis of 3,4-dihydroquinolinones

By: Zhang, Lei; et al

Organic Letters (2013), 15(9), 2128-2131.

Scheme 95 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (81)

Suppliers (55)

Supplier (1)

31-172-CAS-10850077

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: 1,4-Dioxane; 5 min, rt; overnight, 100 °C

Experimental Protocols

Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Scheme 96 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (9)

Suppliers (88)

Suppliers (38)

31-172-CAS-2859339

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9-*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene; 10 min, rt; 24 h, 140 °C

Experimental Protocols

Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Scheme 97 (1 Reaction)



Suppliers (58)

Suppliers (88)

Suppliers (48)

31-172-CAS-13200063

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9-*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene; 10 min, rt; 24 h, 140 °C

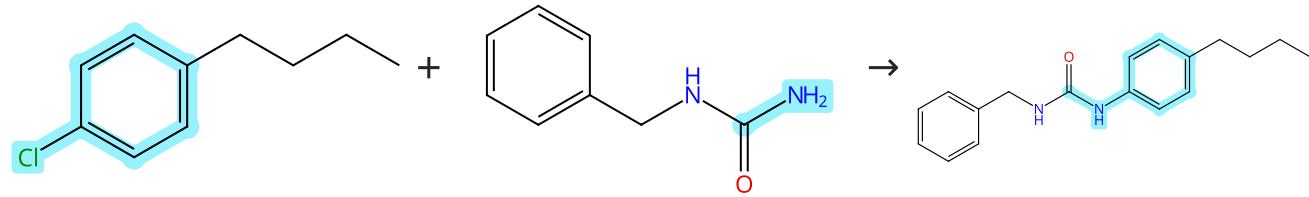
Experimental Protocols

Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Scheme 98 (2 Reactions)



Suppliers (56)

Suppliers (73)

Suppliers (3)

31-172-CAS-12293774

Steps: 1 Yield: 99%

1.1 Catalysts: Palladium diacetate, Water, [3,6-Dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]bis(1,1-dimethylethyl) phosphine

Solvents: Tetrahydrofuran; 4 min, rt → 110 °C

1.2 Reagents: Cesium carbonate; 2 h, rt → 85 °C

Experimental Protocols

Synthesis of Unsymmetrical Diarylureas via Pd-Catalyzed C-N Cross-Coupling Reactions

By: Breitler, Simon; et al

Organic Letters (2011), 13(12), 3262-3265.

31-172-CAS-951887

Steps: 1 Yield: 99%

1.1 Catalysts: Palladium diacetate, Water, [3,6-Dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]bis(1,1-dimethylethyl) phosphine

Solvents: Tetrahydrofuran; 4 min, rt → 110 °C

1.2 Reagents: Tripotassium phosphate; 6 h, rt → 85 °C

Experimental Protocols

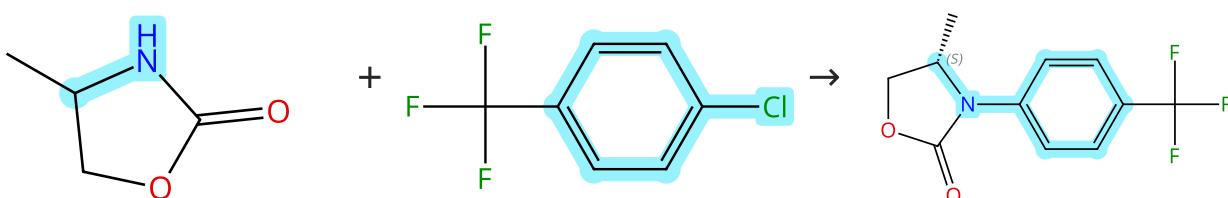
Synthesis of Unsymmetrical Diarylureas via Pd-Catalyzed C-N Cross-Coupling Reactions

By: Breitler, Simon; et al

Organic Letters (2011), 13(12), 3262-3265.

Scheme 99 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (55)

Suppliers (79)

Absolute stereochemistry shown

Suppliers (7)

31-172-CAS-119386

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene; 14 h, 110 °C

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

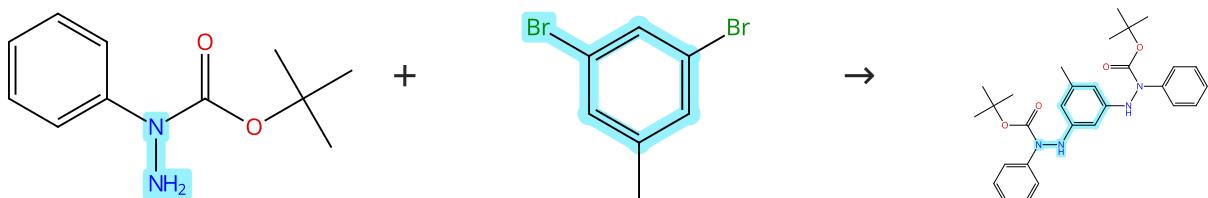
By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Experimental Protocols

Scheme 100 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (18)

Suppliers (91)

31-172-CAS-10411695

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; 2 h, 110 °C

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

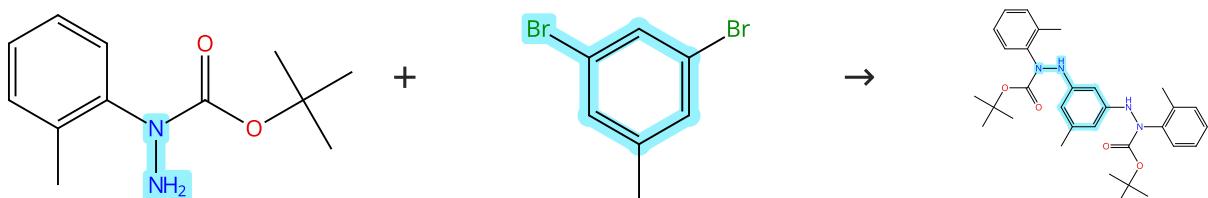
By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Experimental Protocols

Scheme 101 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (3)

Suppliers (91)

31-172-CAS-12532557

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; 2 h, 110 °C

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

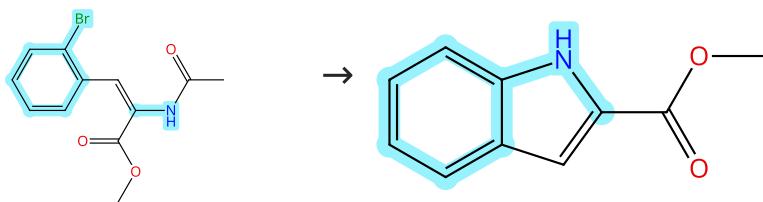
By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Experimental Protocols

Scheme 102 (1 Reaction)

Steps: 1 Yield: 99%



Supplier (1)

Suppliers (96)

31-172-CAS-5493540

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Methylidicyclohexylamine
Catalysts: Tri-*tert*-butylphosphine, Tris(dibenzylideneacetone)dipalladium
Solvents: Toluene; 12 h, 80 °C
- 1.2 **Reagents:** Sodium methoxide
Solvents: Methanol; 12 h, rt

Solid-Phase Synthesis of Indolecarboxylates Using Palladium-Catalyzed Reactions

By: Yamazaki, Kazuo; et al

Journal of Organic Chemistry (2003), 68(15), 6011-6019.

Experimental Protocols

Scheme 103 (1 Reaction)

Steps: 1 Yield: 99%



Supplier (11)

Suppliers (88)

Supplier (4)

31-172-CAS-1319528

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diy)bisp[1,1-diphenylphosphine]
Solvents: Toluene; 10 min, rt; 24 h, 140 °C

Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Experimental Protocols

Scheme 104 (1 Reaction)

Steps: 1 Yield: 99%



Supplier (67)

Supplier (88)

Supplier (2)

31-172-CAS-11183773

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Xylene; 24 h, 130 °C

Palladium-mediated N-arylation of heterocyclic diamines: insights into the origin of an unusual chemoselectivity

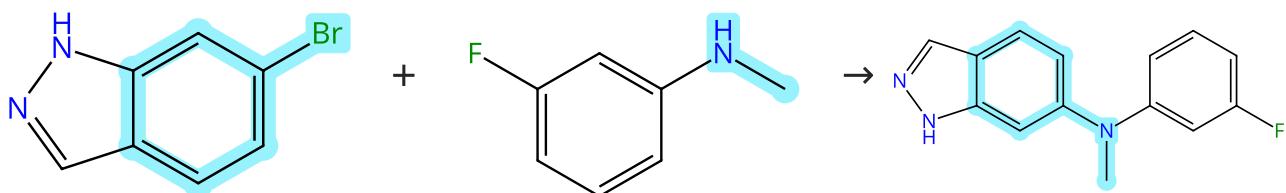
By: Cabello-Sanchez, Noemi; et al

Journal of Organic Chemistry (2007), 72(6), 2030-2039.

Experimental Protocols

Scheme 105 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (93)

Suppliers (66)

Suppliers (2)

31-172-CAS-5351407

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Lithium bis(trimethylsilyl)amide
Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Nethyl)phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium
Solvents: Tetrahydrofuran; 4 h, 65 °C; 65 °C → rt
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Water; rt
- 1.3 **Reagents:** Sodium bicarbonate
Solvents: Ethyl acetate, Water; rt

Efficient Pd-catalyzed amination reactions for heterocycle functionalization

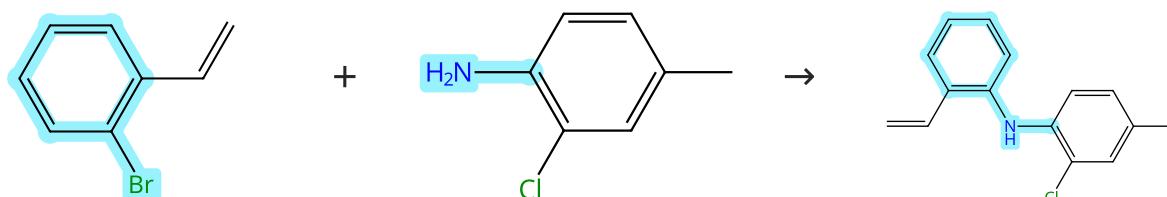
By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Experimental Protocols

Scheme 106 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (81)

Suppliers (100)

Suppliers (3)

31-172-CAS-5156674

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, Dicyclohexyl[3,6-dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine
Solvents: 1,4-Dioxane; 4 h, 110 °C; 110 °C → rt
- 1.2 **Reagents:** Water; rt

Synthesis of Heterocycles via Pd-Ligand Controlled Cyclization of 2-Chloro-N-(2-vinyl)aniline: Preparation of Carbazoles, Indoles, Dibenzazepines, and Acridines

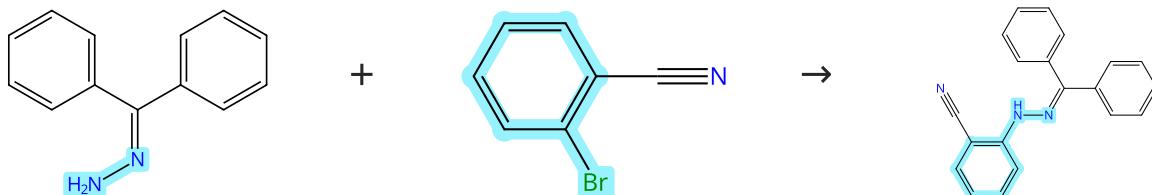
By: Tsvelikhovsky, Dmitry; et al

Journal of the American Chemical Society (2010), 132(40), 14048-14051.

Experimental Protocols

Scheme 107 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (86)

Suppliers (91)

Suppliers (3)

31-172-CAS-3492329

Steps: 1 Yield: 99%

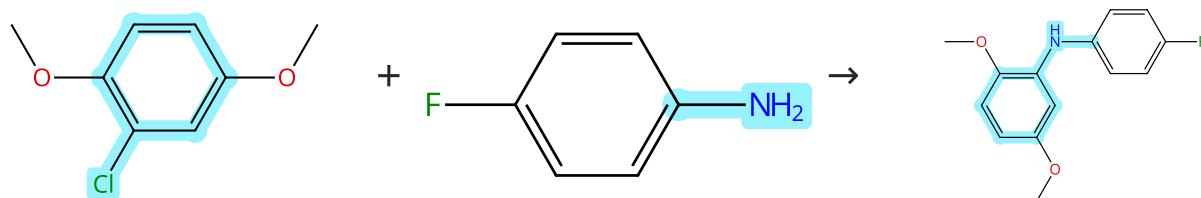
1.1 **Catalysts:** Palladium diacetate, BINAP**Solvents:** Toluene; 3 min, 100 °C; 100 °C → rt1.2 **Reagents:** Cesium carbonate**Solvents:** Toluene; 7 h, 100 °C

Experimental Protocols

Two-Step Synthesis of Substituted 3-Aminoindazoles from 2-Bromobenzonitriles

By: Lefebvre, Valerie; et al

Journal of Organic Chemistry (2010), 75(8), 2730-2732.

Scheme 108 (1 Reaction)

Suppliers (74)

Suppliers (73)

Supplier (1)

31-172-CAS-3159991

Steps: 1 Yield: 99%

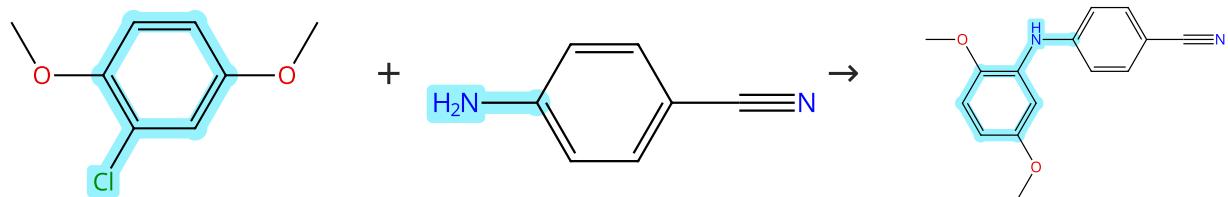
1.1 **Catalysts:** Palladium diacetate, Water, X-Phos**Solvents:** 1,4-Dioxane; rt → 80 °C; 1 min, 80 °C1.2 **Reagents:** Sodium *tert*-butoxide**Solvents:** 1,4-Dioxane; rt → 110 °C; 1 h, 110 °C

Experimental Protocols

Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions

By: Fors, Brett P.; et al

Organic Letters (2008), 10(16), 3505-3508.

Scheme 109 (1 Reaction)

Suppliers (74)

Suppliers (106)

Supplier (4)

31-172-CAS-11661966

Steps: 1 Yield: 99%

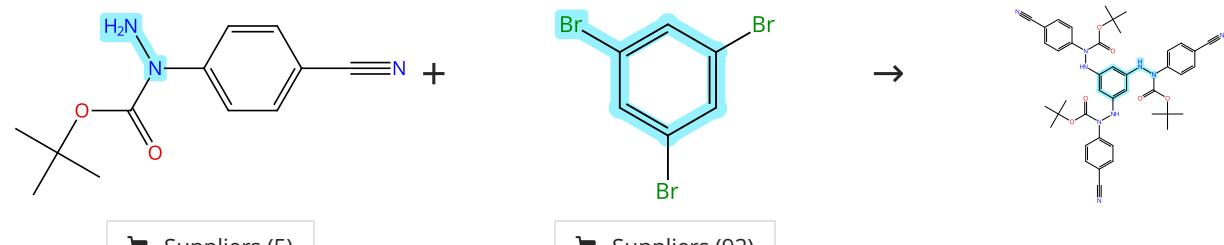
1.1 **Reagents:** Potassium carbonate**Catalysts:** (*SP*-4-[2-[2-(Amino- κ Methyl]phenyl- κ C]chloro [dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl] phosphine]palladium**Solvents:** *tert*-Butanol; 1 h, rt → 110 °C

Experimental Protocols

A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

Scheme 110 (1 Reaction)

Suppliers (5)

Suppliers (92)

31-172-CAS-8481813

Steps: 1 Yield: 99%

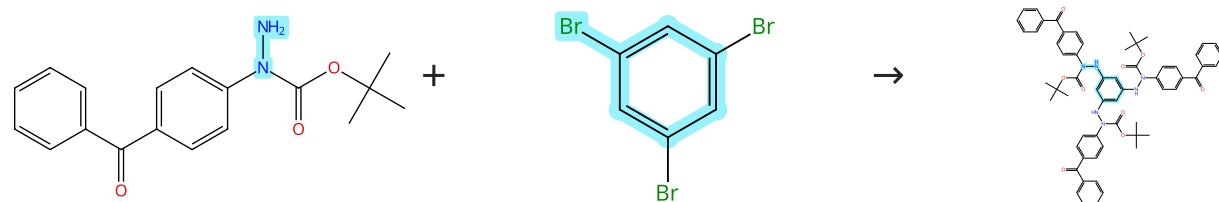
Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Experimental Protocols

Scheme 111 (1 Reaction)



Supplier (1)

Suppliers (92)

31-172-CAS-4985496

Steps: 1 Yield: 99%

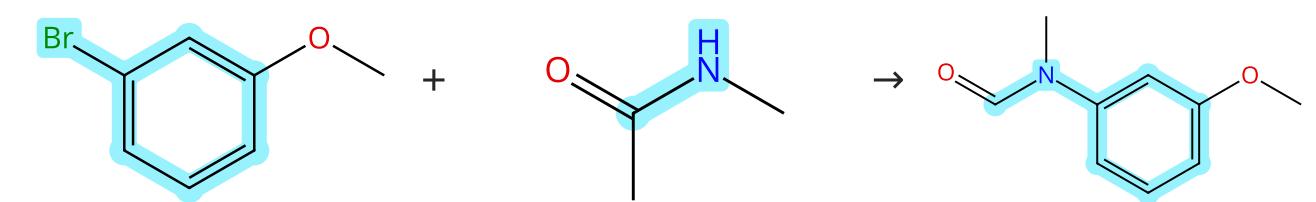
Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Experimental Protocols

Scheme 112 (1 Reaction)



Supplier (91)

Suppliers (63)

Suppliers (6)

31-172-CAS-4905115

Steps: 1 Yield: 99%

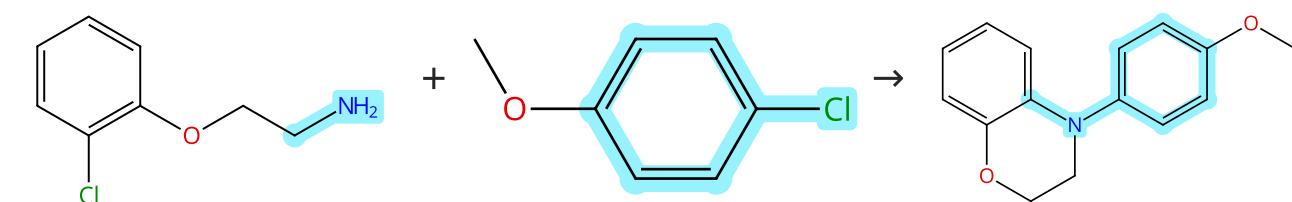
Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Experimental Protocols

Scheme 113 (1 Reaction)



Supplier (66)

Suppliers (79)

Suppliers (3)

31-172-CAS-12269762

Steps: 1 Yield: 99%

- 1.1 **Reagents:** *tert*-Butanol, Sodium hydride
Catalysts: Palladium diacetate, 1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene
Solvents: 1,4-Dioxane; 15 min, 100 °C
- 1.2 **Solvents:** 1,4-Dioxane; 4 h, 100 °C
- 1.3 **Solvents:** 1,4-Dioxane; 6 h, 100 °C; 100 °C → rt

Experimental Protocols

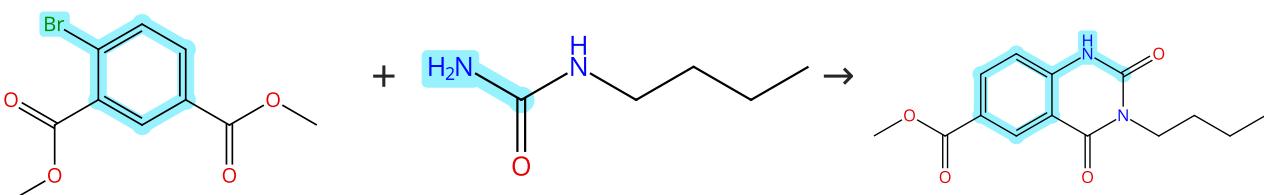
Novel synthetic strategy of N-arylated heterocycles via sequential palladium-catalyzed intra- and inter-arylation reactions

By: Omar-Amrani, Rafik; et al

Synthesis (2004), (15), 2527-2534.

Scheme 114 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (40)

Suppliers (57)

31-172-CAS-10968665

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: 1,4-Dioxane; rt → 100 °C; 48 h, 100 °C; 100 °C → rt

Experimental Protocols

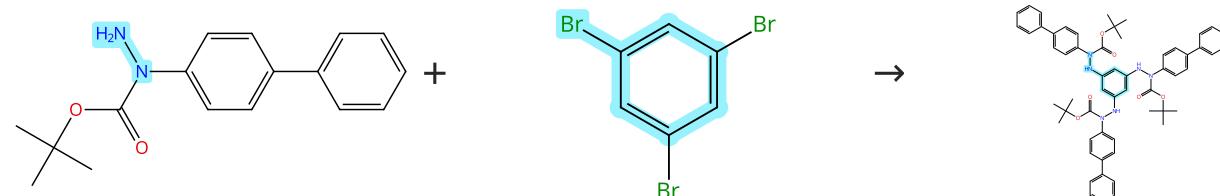
Tandem Palladium-Catalyzed Urea Arylation-Intramolecular Ester Amidation: Regioselective Synthesis of 3-Alkylated 2,4-Quinazolininediones

By: Willis, Michael C.; et al

Organic Letters (2006), 8(22), 5089-5091.

Scheme 115 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (2)

Suppliers (92)

31-172-CAS-7034490

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene, Hexane; 30 min, rt; 2 h, 110 °C

Experimental Protocols

Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Scheme 116 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (3)

Suppliers (101)

31-172-CAS-2210224

Steps: 1 Yield: 99%

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

By: Kang, Hong-Min; et al

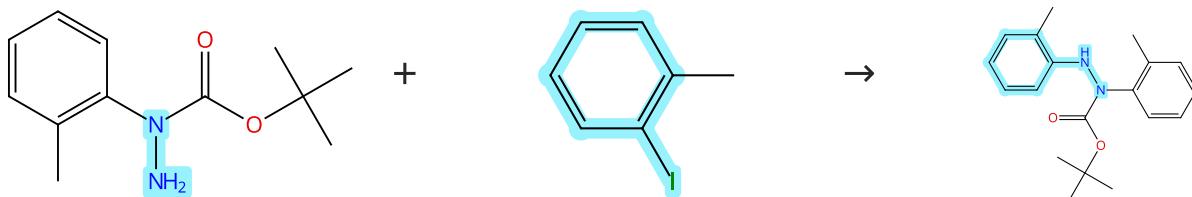
Organic Letters (2006), 8(10), 2047-2050.

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; 2 h, 110 °C

Experimental Protocols

Scheme 117 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (3)

Suppliers (85)

31-172-CAS-4342429

Steps: 1 Yield: 99%

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Experimental Protocols

Scheme 118 (2 Reactions)

Steps: 1 Yield: 99%



Suppliers (4)

Suppliers (92)

31-172-CAS-12213131

Steps: 1 Yield: 99%

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Experimental Protocols

31-172-CAS-10619113

Steps: 1 Yield: 99%

Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

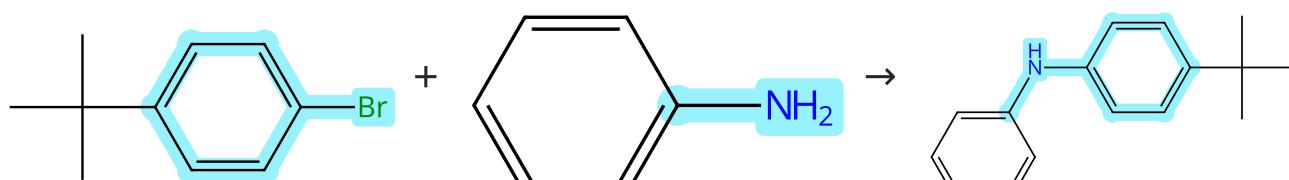
By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Experimental Protocols

Scheme 119 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (90)

Suppliers (100)

Suppliers (64)

31-172-CAS-10978776

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

Experimental Protocols

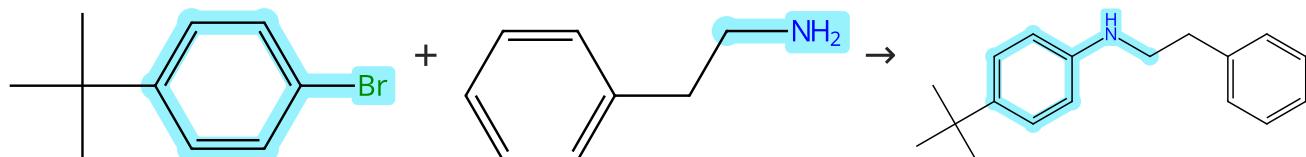
P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 120 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (90)

Suppliers (66)

Suppliers (3)

31-172-CAS-9972699

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1-[2-[Bis(1,1-dimethylethyl)phosphino]phenyl]-2,5-diphenyl-1*H*-pyrrole

Solvents: Toluene; rt

1.2 2 - 16 h, 85 °C; 85 °C → rt

1.3 Reagents: Water; rt

Experimental Protocols

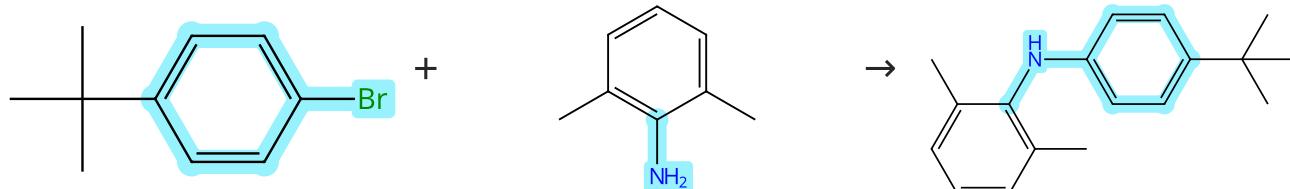
Alternative biarylphosphines for use in the palladium-catalyzed amination of aryl halides

By: Singer, Robert A.; et al

Synthesis (2003), (11), 1727-1731.

Scheme 121 (2 Reactions)

Steps: 1 Yield: 96-99%



Suppliers (90)

Suppliers (92)

Supplier (1)

31-172-CAS-1788335

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1-[2-[Bis(1,1-dimethylethyl)phosphino]phenyl]-3,5-diphenyl-1*H*-pyrazole

Solvents: 2-Methyl-2-butanol; rt

1.2 2 - 16 h, 85 °C; 85 °C → rt

1.3 Reagents: Water; rt

Experimental Protocols

Alternative biarylphosphines for use in the palladium-catalyzed amination of aryl halides

By: Singer, Robert A.; et al

Synthesis (2003), (11), 1727-1731.

31-172-CAS-10913898

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1-[2-[Bis(1-methylethyl)phosphino]phenyl]-3,5-diphenyl-1*H*-pyrazole

Solvents: Toluene; rt

1.2 2 - 16 h, 85 °C; 85 °C → rt

1.3 Reagents: Water; rt

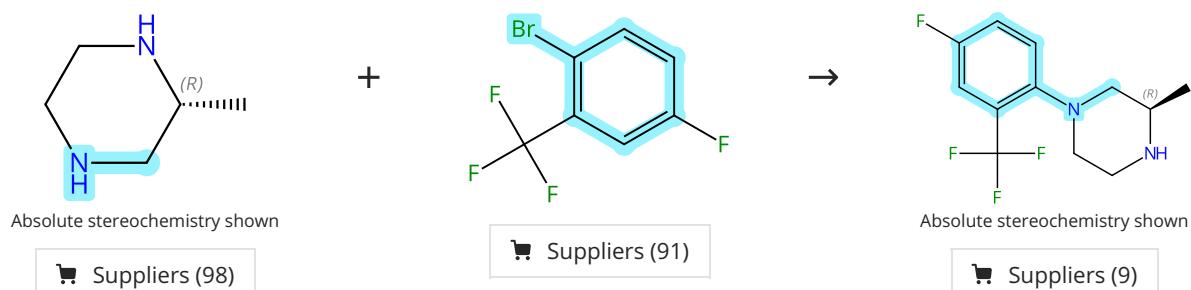
Experimental Protocols

Alternative biarylphosphines for use in the palladium-catalyzed amination of aryl halides

By: Singer, Robert A.; et al

Synthesis (2003), (11), 1727-1731.

Scheme 122 (1 Reaction)



31-172-CAS-5684416

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; 5 h, 100 °C

1.2 Reagents: Sodium hydroxide

Solvents: Water; pH 10, 0 °C

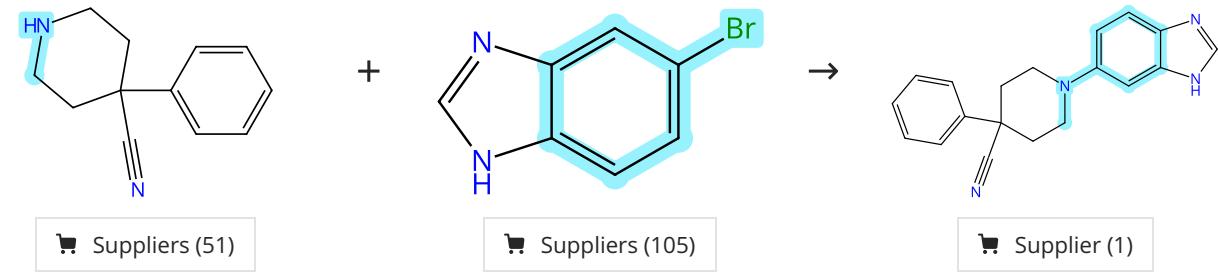
Experimental Protocols

Efficacious 11 β -Hydroxysteroid Dehydrogenase Type I Inhibitors in the Diet-Induced Obesity Mouse Model

By: Wan, Zhao-Kui; et al

Journal of Medicinal Chemistry (2009), 52(17), 5449-5461.

Scheme 123 (1 Reaction)



31-172-CAS-780296

Steps: 1 Yield: 99%

1.1 Reagents: Lithium bis(trimethylsilyl)amide

Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium

Solvents: Tetrahydrofuran; 4 h, 65 °C; 65 °C → rt

1.2 Reagents: Hydrochloric acid

Solvents: Water; rt

1.3 Reagents: Sodium bicarbonate

Solvents: Ethyl acetate, Water; rt

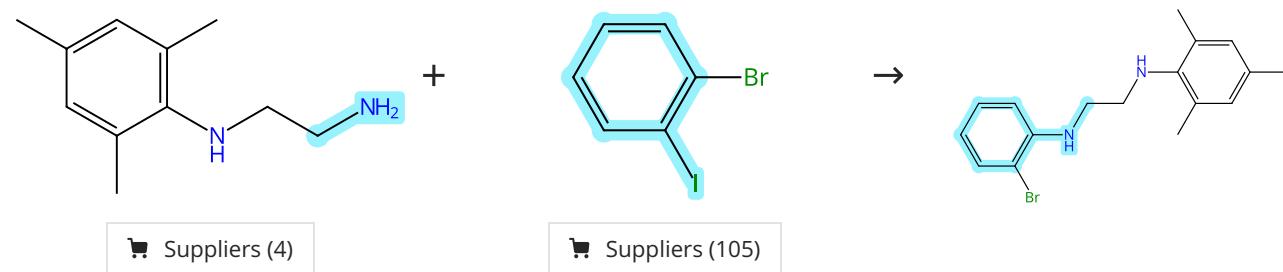
Experimental Protocols

Efficient Pd-catalyzed amination reactions for heterocycle functionalization

By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Scheme 124 (1 Reaction)



31-172-CAS-11529586

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene

1.2 rt; 30 min, 110 °C; 110 °C → rt

Experimental Protocols

New Phosphine-Functionalized NHC Ligands: Discovery of an Effective Catalyst for the Room-Temperature Amination of Aryl Chlorides with Primary and Secondary Amines

By: Wheaton, Craig A.; et al

Organometallics (2013), 32(21), 6148-6161.

Scheme 125 (1 Reaction)



Supplier (1)

Suppliers (72)

Steps: 1 Yield: 99%

31-172-CAS-10876710

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, Dicyclohexyl[3,6-dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine

Solvents: *tert*-Butanol, 1,4-Dioxane; 45 min, rt

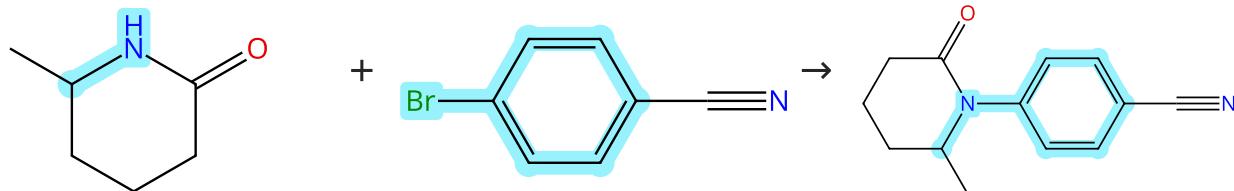
Experimental Protocols

Tetra-Substituted Pyridinylimidazoles As Dual Inhibitors of p38 α Mitogen-Activated Protein Kinase and c-Jun N-Terminal Kinase 3 for Potential Treatment of Neurodegenerative Diseases

By: Muth, Felix; et al

Journal of Medicinal Chemistry (2015), 58(1), 443-456.

Scheme 126 (1 Reaction)



Supplier (67)

Suppliers (105)

Supplier (4)

Steps: 1 Yield: 99%

31-172-CAS-3848859

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 5 min, rt; overnight, 100 °C

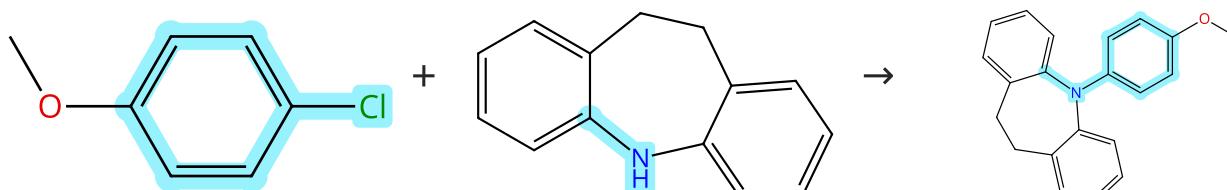
Experimental Protocols

Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Scheme 127 (1 Reaction)



Supplier (79)

Supplier (101)

Supplier (1)

Steps: 1 Yield: 99%

31-172-CAS-8115177

Steps: 1 Yield: 99%

1.1 **Catalysts:** Tris(dibenzylideneacetone)dipalladium, 2-[2-(Dicyclohexylphosphino)phenyl]-1-methyl-1*H*-benzimidazole
Solvents: Toluene; rt

1.2 **Reagents:** Sodium *tert*-butoxide
Solvents: Toluene; > 1 min, rt; 20 h, 135 °C; 135 °C → rt

1.3 **Reagents:** Water

Experimental Protocols

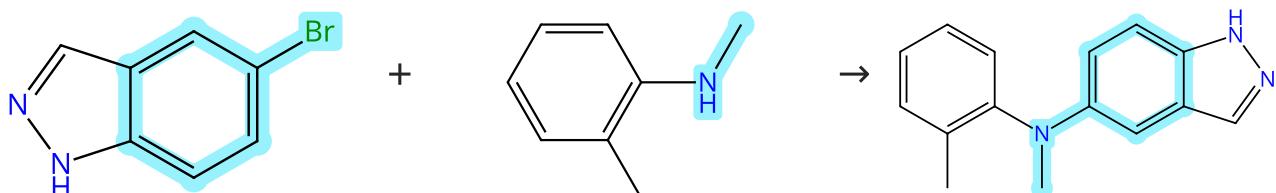
Buchwald-Hartwig amination of aryl chlorides catalyzed by easily accessible benzimidazolyl phosphine-Pd complexes

By: Chung, Kin Ho; et al

Synlett (2012), 23(8), 1181-1186.

Scheme 128 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (111)

Suppliers (58)

Suppliers (2)

31-172-CAS-8103503

Steps: 1 Yield: 99%

1.1 **Reagents:** Lithium bis(trimethylsilyl)amide
Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Nethyl)phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium
Solvents: Tetrahydrofuran; 4 h, 65 °C; 65 °C → rt

1.2 **Reagents:** Hydrochloric acid

Solvents: Water; rt

1.3 **Reagents:** Sodium bicarbonate

Solvents: Ethyl acetate, Water; rt

Experimental Protocols

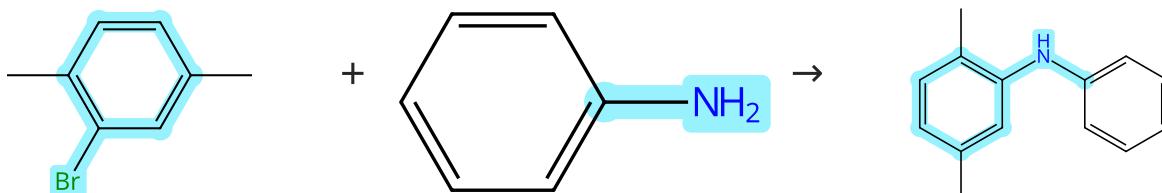
Efficient Pd-catalyzed amination reactions for heterocycle functionalization

By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Scheme 129 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (89)

Suppliers (100)

Suppliers (20)

31-172-CAS-10953837

Steps: 1 Yield: 99%

1.1 **Reagents:** Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, BIPHEP
Solvents: Toluene

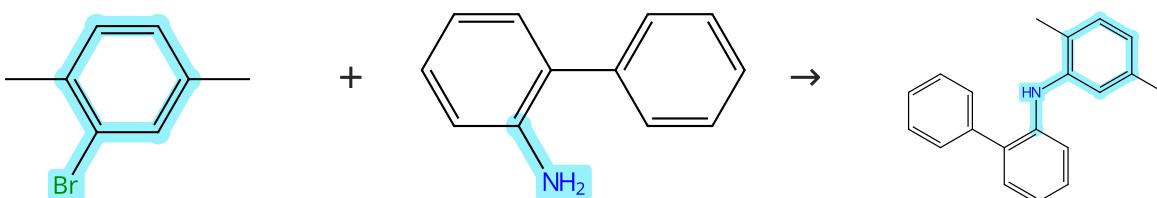
Experimental Protocols

2,2'-Bis(diphenylphosphino)-1,1'-biphenyl: New Entry of Bidentate Triarylphosphine Ligand to Transition Metal Catalysts

By: Ogasawara, Masamichi; et al

Organometallics (2000), 19(8), 1567-1571.

Scheme 130 (1 Reaction)



Suppliers (89)

Suppliers (76)

Supplier (1)

31-172-CAS-2111172

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

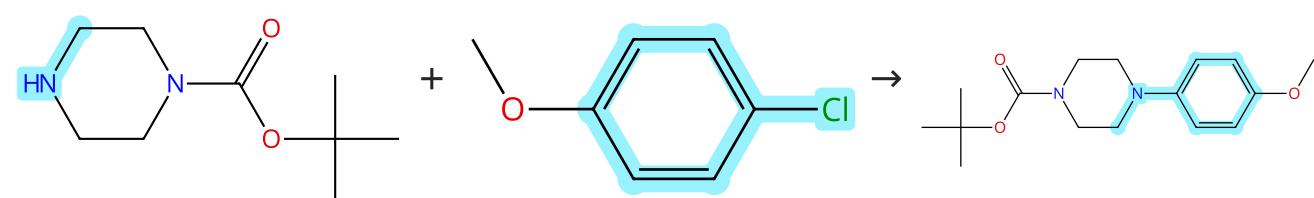
P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 131 (1 Reaction)



Suppliers (130)

Suppliers (79)

Suppliers (29)

31-172-CAS-5841810

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 24 h, 100 °C; 100 °C → rt

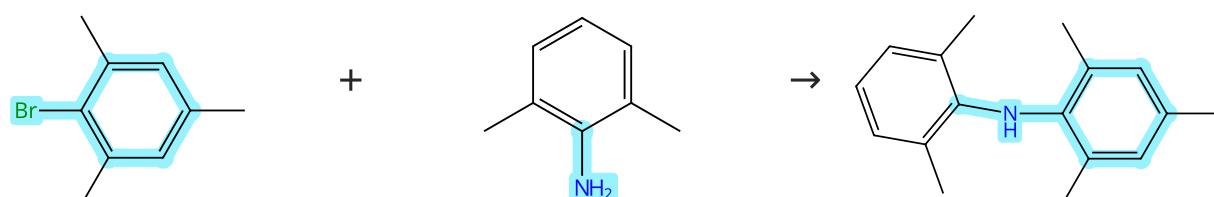
Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols

Scheme 132 (1 Reaction)



Suppliers (93)

Suppliers (92)

Suppliers (5)

31-172-CAS-8512459

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

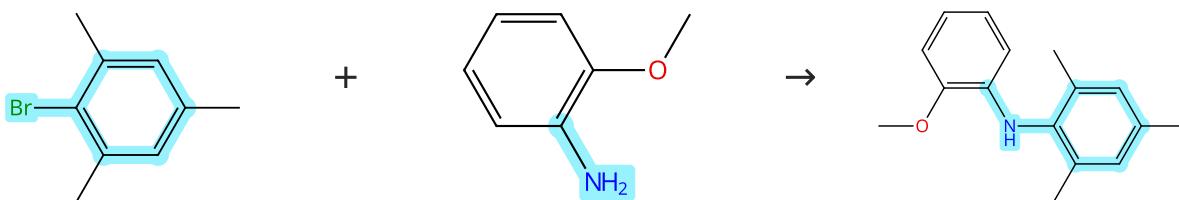
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 133 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (93)

Suppliers (85)

Suppliers (4)

31-172-CAS-6378948

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

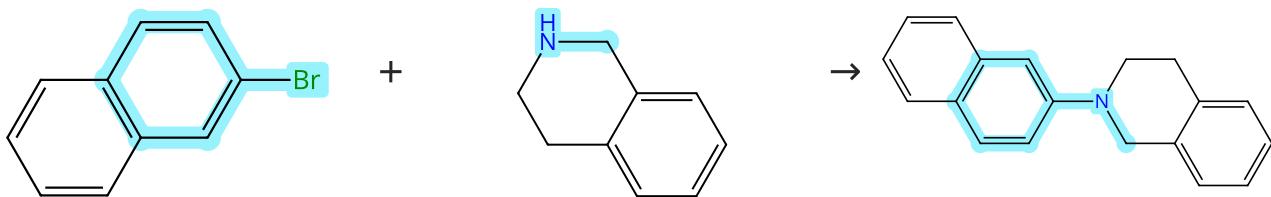
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 134 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (101)

Suppliers (102)

Supplier (1)

31-172-CAS-8419475

Steps: 1 Yield: 99%

An aromatic amination approach towards ancistrocladinium A/B

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; 15 min, rt → 110 °C; 110 °C → rt

1.2 Reagents: Sodium *tert*-butoxide; 4 - 18 h, reflux

By: Buckley, Benjamin R.; et al

Synlett (2010), (6), 939-943.

Experimental Protocols

Scheme 135 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (6)

Suppliers (88)

Suppliers (2)

31-172-CAS-1048953

Steps: 1 Yield: 99%

Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

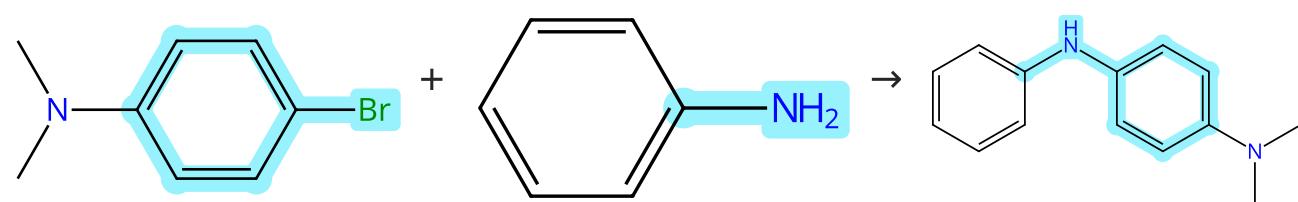
Solvents: Toluene; 10 min, rt; 24 h, 140 °C

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Experimental Protocols

Scheme 136 (1 Reaction)



Suppliers (94)

Suppliers (100)

Suppliers (5)

31-172-CAS-9853849

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, rt

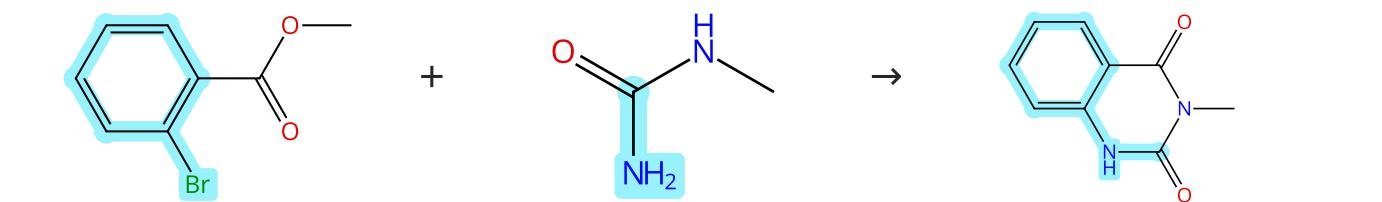
Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Scheme 137 (1 Reaction)



Suppliers (90)

Suppliers (84)

Suppliers (56)

31-172-CAS-1893165

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]Solvents: 1,4-Dioxane; rt \rightarrow 100 °C; 48 h, 100 °C; 100 °C \rightarrow rt

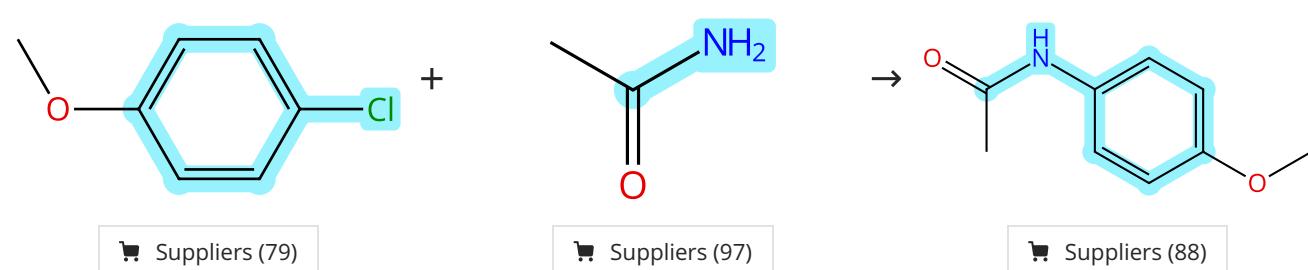
Experimental Protocols

Tandem Palladium-Catalyzed Urea Arylation-Ester Amidation: Regioselective Synthesis of 3-Alkylated 2,4-Quinazolininediones

By: Willis, Michael C.; et al

Organic Letters (2006), 8(22), 5089-5091.

Scheme 138 (2 Reactions)



Suppliers (79)

Suppliers (97)

Suppliers (88)

31-172-CAS-2973353

Steps: 1 Yield: 99%

Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation

By: Ikawa, Takashi; et al

Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Experimental Protocols

31-172-CAS-7333113

Steps: 1 Yield: 98%

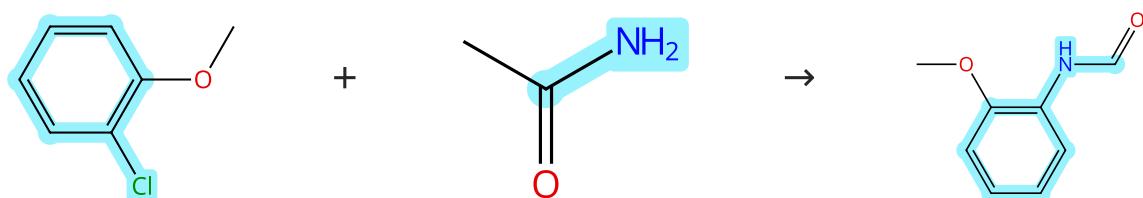
1.1 **Catalysts:** Palladium diacetate, Water, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine**Solvents:** *tert*-Butanol; rt → 110 °C; 1.5 min, 110 °C1.2 **Reagents:** Tripotassium phosphate; rt → 110 °C; 3 h, 110 °C

Experimental Protocols

Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions

By: Fors, Brett P.; et al

Organic Letters (2008), 10(16), 3505-3508.

Scheme 139 (1 Reaction)

Suppliers (66)

Suppliers (97)

Suppliers (15)

31-614-CAS-27858918

Steps: 1 Yield: 99%

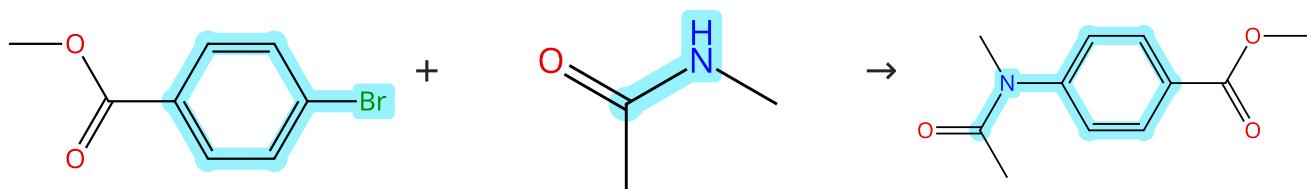
1.1 **Reagents:** Tripotassium phosphate**Catalysts:** Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine**Solvents:** *tert*-Butanol; 7 h, 110 °C

Experimental Protocols

Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation

By: Ikawa, Takashi; et al

Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Scheme 140 (1 Reaction)

Suppliers (100)

Suppliers (63)

Suppliers (4)

31-172-CAS-5277824

Steps: 1 Yield: 99%

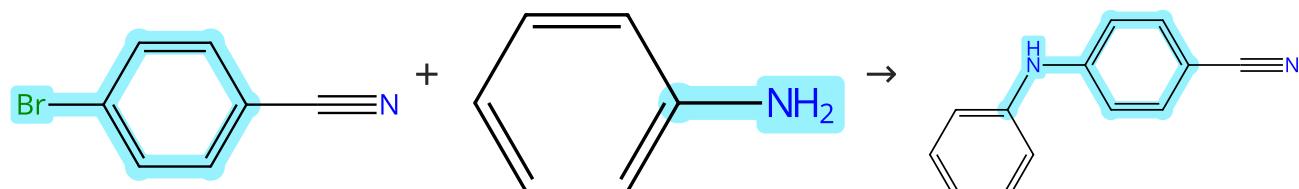
1.1 **Reagents:** Cesium carbonate**Catalysts:** Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]**Solvents:** 1,4-Dioxane

Experimental Protocols

Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Scheme 141 (1 Reaction)

Suppliers (105)

Suppliers (100)

Suppliers (47)

31-172-CAS-13437567

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

Experimental Protocols

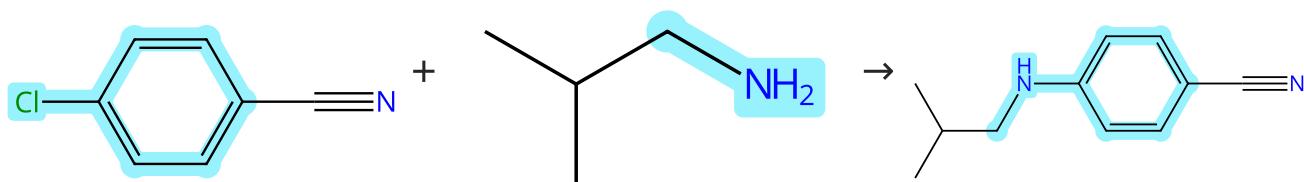
P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 142 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (102)

Suppliers (60)

Suppliers (25)

31-172-CAS-8019358

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 24 h, 80 °C

Experimental Protocols

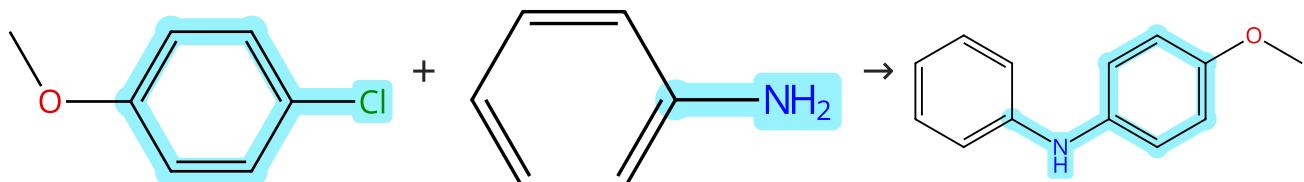
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 143 (3 Reactions)

Steps: 1 Yield: 97-99%



Suppliers (79)

Suppliers (100)

Suppliers (76)

31-172-CAS-5154302

Steps: 1 Yield: 99%

1.1 Catalysts: Palladium diacetate, Water, X-Phos

Solvents: 1,4-Dioxane; rt → 80 °C; 2 min, 80 °C

1.2 Reagents: Sodium *tert*-butoxide

Solvents: 1,4-Dioxane; rt → 110 °C

Experimental Protocols

Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions

By: Fors, Brett P.; et al

Organic Letters (2008), 10(16), 3505-3508.

31-172-CAS-9810085

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: X-Phos, (*SP*-4-4)-[2-[2-(Amino-*k*Methyl]phenyl-*k*C] chloro[dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine]palladium

Solvents: 1,4-Dioxane; 10 min, rt → 100 °C

Experimental Protocols

A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

31-172-CAS-4933110

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 80 °C

Experimental Protocols

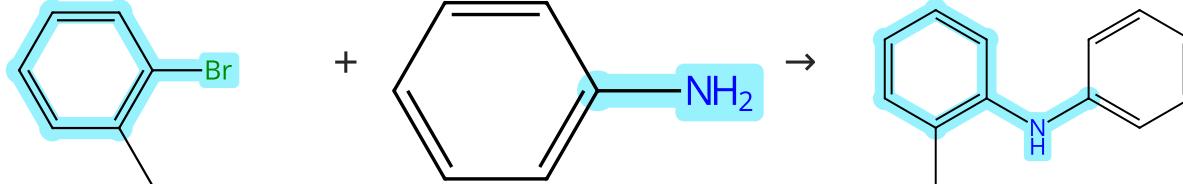
Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Scheme 144 (2 Reactions)

Steps: 1 Yield: 97-99%



Suppliers (65)

Suppliers (100)

Suppliers (57)

31-172-CAS-5873280

Steps: 1 Yield: 99%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, rt

Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

31-172-CAS-14006156

Steps: 1 Yield: 97%

1.1 Reagents: Potassium hydroxide, Water

Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tert*-butylphosphine)palladium

Solvents: Toluene

Experimental Protocols

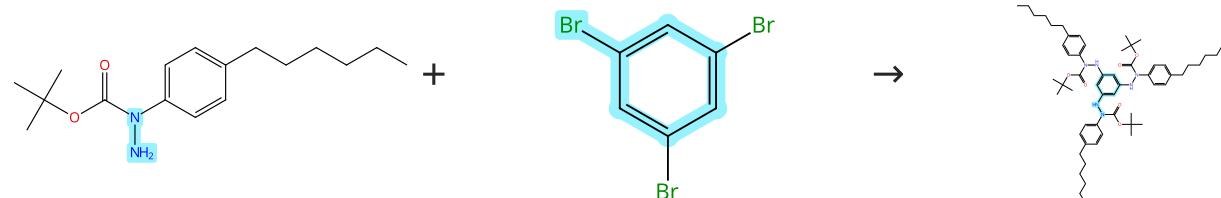
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 145 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (3)

Suppliers (92)

31-172-CAS-12732302

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine

Solvents: Toluene, Hexane; 30 min, rt; 2 h, 110 °C

Experimental Protocols

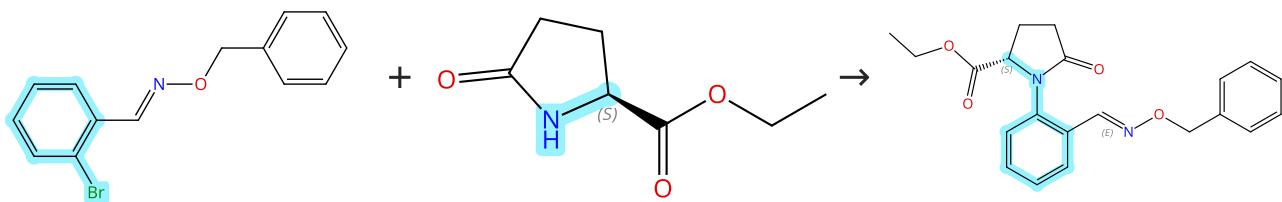
Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Scheme 146 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (2)

Suppliers (87)

Absolute stereochemistry shown,
Rotation (-)
Double bond geometry shown

31-172-CAS-1763139

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 8 h, 100 °C

Total Synthesis of (-)-Martinellic Acid via Radical Addition-Cyclization-Elimination Reaction

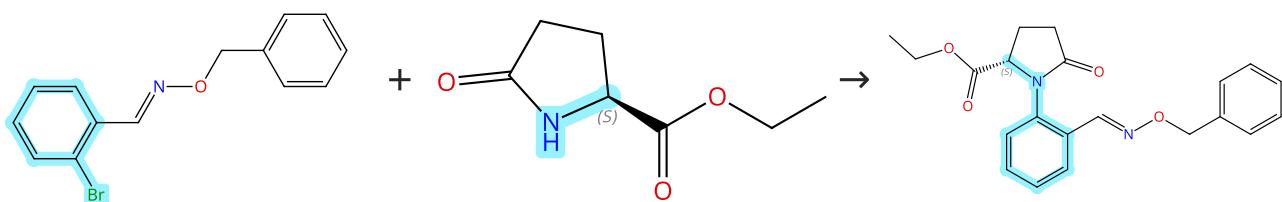
By: Shirai, Atsushi; et al

Journal of Organic Chemistry (2008), 73(12), 4464-4475.

Experimental Protocols

Scheme 147 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (2)

Suppliers (87)

Absolute stereochemistry shown
Double bond geometry unknown

31-172-CAS-14941013

Steps: 1 Yield: 99%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 100 °C

An improved synthesis of (-)-martinellic acid via radical addition-cyclization-elimination reaction of chiral oxime ether

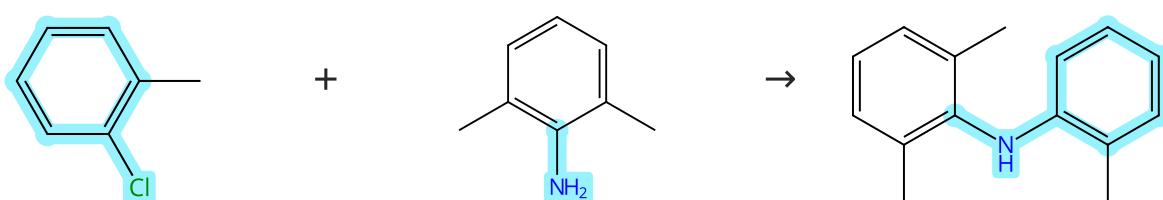
By: Miyata, Okiko; et al

Synlett (2006), (6), 893-896.

Experimental Protocols

Scheme 148 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (70)

Suppliers (92)

Suppliers (19)

31-172-CAS-4132156

Steps: 1 Yield: 99%

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-[2-(Dicyclohexylphosphino)phenyl]-1-methyl-1*H*-benzimidazole
Solvents: Toluene; rt

1.2 Reagents: Sodium *tert*-butoxide
Solvents: Toluene; > 1 min, rt; 20 h, 135 °C; 135 °C → rt

1.3 Reagents: Water

Experimental Protocols

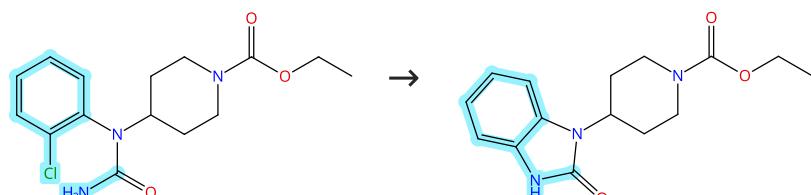
Buchwald-Hartwig amination of aryl chlorides catalyzed by easily accessible benzimidazolyl phosphine-Pd complexes

By: Chung, Kin Ho; et al

Synlett (2012), 23(8), 1181-1186.

Scheme 149 (1 Reaction)

Steps: 1 Yield: 99%



Supplier (1)

Suppliers (8)

31-172-CAS-5201094

Steps: 1 Yield: 99%

Efficient access to cyclic ureas via Pd-catalyzed cyclization

1.1 Reagents: Sodium bicarbonate
Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: Isopropanol; 16 h, 83 °C

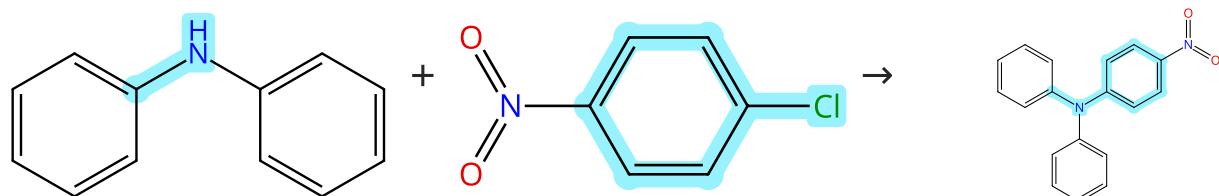
Experimental Protocols

By: McLaughlin, Mark; et al

Organic Letters (2006), 8(15), 3311-3314.

Scheme 150 (1 Reaction)

Steps: 1 Yield: 98%



Supplier (108)

Suppliers (64)

Suppliers (76)

31-172-CAS-14706551

Steps: 1 Yield: 98%

Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

1.1 Reagents: Potassium hydroxide, Water
Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tert*-butylphosphine)palladium
Solvents: Toluene

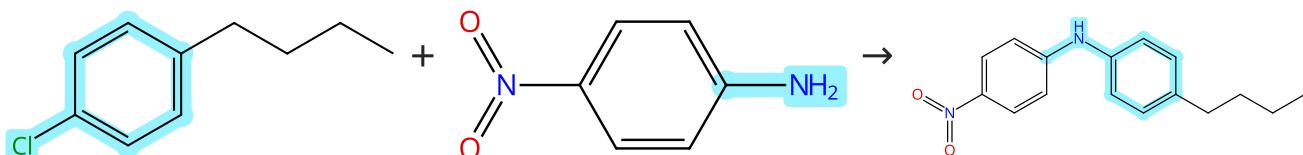
By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Experimental Protocols

Scheme 151 (2 Reactions)

Steps: 1 Yield: 96-98%



Supplier (56)

Suppliers (94)

Suppliers (2)

31-172-CAS-14393183

Steps: 1 Yield: 98%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C]chloro [dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl] phosphine]palladiumSolvents: *tert*-Butanol; 1 h, rt \rightarrow 110 °C

Experimental Protocols

A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

31-172-CAS-7620817

Steps: 1 Yield: 96%

1.1 Catalysts: Palladium diacetate, Water, X-Phos

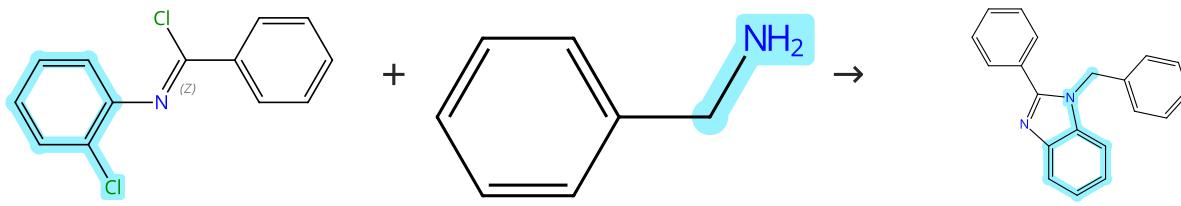
Solvents: *tert*-Butanol; rt \rightarrow 80 °C; 1 min, 80 °C1.2 Reagents: Potassium carbonate; rt \rightarrow 110 °C; 1 h, 110 °C

Experimental Protocols

Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions

By: Fors, Brett P.; et al

Organic Letters (2008), 10(16), 3505-3508.

Scheme 152 (1 Reaction)

Double bond geometry shown

Supplier (1)
Suppliers (82)
Suppliers (42)

31-172-CAS-1041085

Steps: 1 Yield: 98%

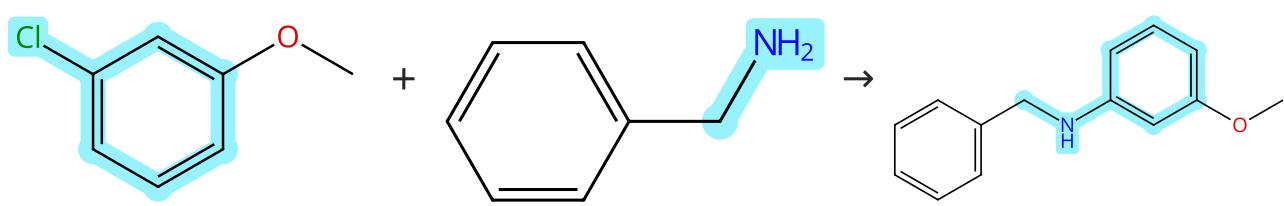
1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 2'-(Dicyclohexylphosphino)-*N*, *N*-dimethyl[1,1'-biphenyl]-2-amineSolvents: Toluene; 18 h, 100 °C; 100 °C \rightarrow rt

Experimental Protocols

Palladium-Catalyzed Synthesis of Benzimidazoles and Quinazolinones from Common Precursors

By: Sadig, Jessie E. R.; et al

Journal of Organic Chemistry (2012), 77(21), 9473-9486.

Scheme 153 (1 Reaction)
Suppliers (82)
Suppliers (82)
Suppliers (52)

31-172-CAS-12268652

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 48 h, 80 °C

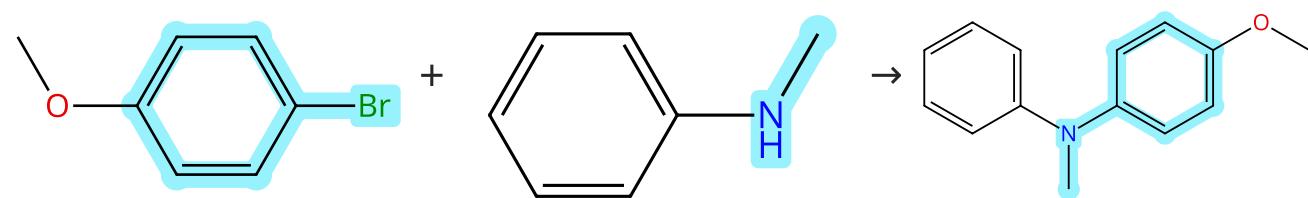
Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 154 (1 Reaction)



Suppliers (79)

Suppliers (75)

Suppliers (23)

31-172-CAS-11940312

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium
Solvents: Toluene; 3 - 6 h, rt

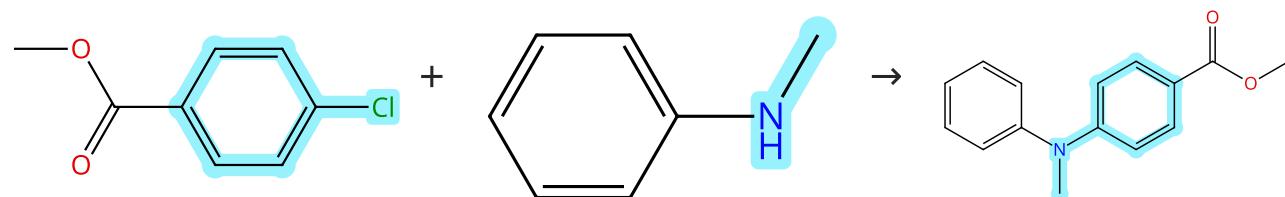
Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Scheme 155 (2 Reactions)



Suppliers (99)

Suppliers (75)

Suppliers (3)

31-172-CAS-4961913

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Bis(dibenzylideneacetone)palladium, Dicyclohexyl(2'-methoxy[1,1'-binaphthalen]-2-yl)phosphine
Solvents: 1,2-Dimethoxyethane; rt; 16 h, 110 °C

Experimental Protocols

Synthesis of Bulky and Electron-Rich MOP-type Ligands and Their Applications in Palladium-Catalyzed C-N Bond Formation

By: Xie, Xiaomin; et al

Journal of Organic Chemistry (2006), 71(17), 6522-6529.

31-172-CAS-12185125

Steps: 1 Yield: 97%

1.1 Reagents: Tripotassium phosphate
Catalysts: Bis(dibenzylideneacetone)palladium, 1'-(Bis(1,1-dimethylethyl)phosphino)-1,2,3,4,5-pentaphenylferrocene
Solvents: 1,2-Dimethoxyethane

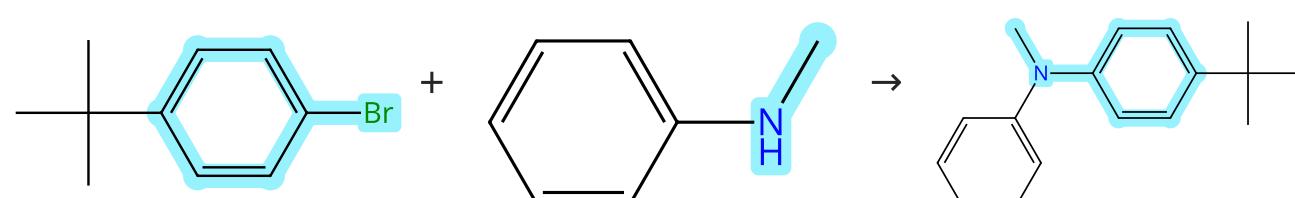
Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 156 (1 Reaction)



Suppliers (90)

Suppliers (75)

Suppliers (3)

31-172-CAS-13945234

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

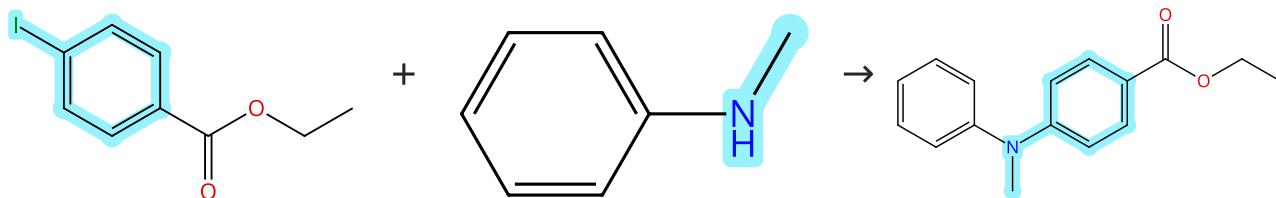
Solvents: Toluene

Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 157 (2 Reactions)

Suppliers (94)

Suppliers (75)

Suppliers (5)

31-172-CAS-8634877

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; rt; 17 h, reflux

Experimental Protocols

Study of a New Rate Increasing "Base Effect" in the Palladium-Catalyzed Amination of Aryl Iodides

By: Meyers, Caroline; et al

Journal of Organic Chemistry (2004), 69(18), 6010-6017.

31-172-CAS-1740878

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

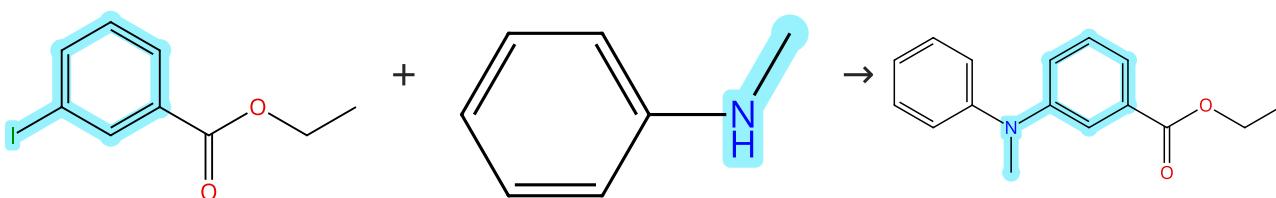
Solvents: Toluene; 17 h, 120 °C

Experimental Protocols

Selective palladium-catalyzed aminations on 2-chloro-3-iodo- and 2-chloro-5-iodopyridine

By: Maes, Bert U. W.; et al

Synlett (2002), (12), 1995-1998.

Scheme 158 (2 Reactions)

Suppliers (84)

Suppliers (75)

Steps: 1 Yield: 98%

31-172-CAS-14743225

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; rt; 17 h, reflux

Experimental Protocols

Study of a New Rate Increasing "Base Effect" in the Palladium-Catalyzed Amination of Aryl Iodides

By: Meyers, Caroline; et al

Journal of Organic Chemistry (2004), 69(18), 6010-6017.

31-172-CAS-13001536

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 17 h, 120 °C

Experimental Protocols

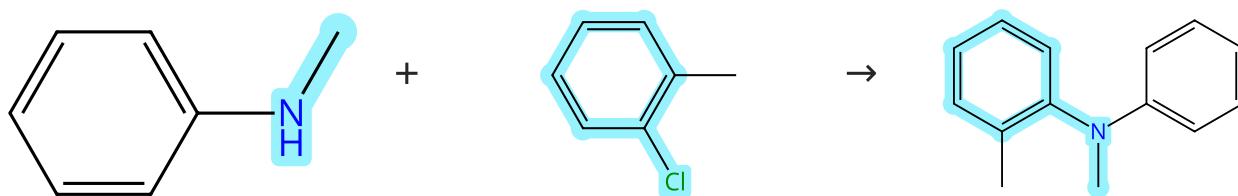
Selective palladium-catalyzed aminations on 2-chloro-3-iodo- and 2-chloro-5-iodopyridine

By: Maes, Bert U. W.; et al

Synlett (2002), (12), 1995-1998.

Scheme 159 (2 Reactions)

Steps: 1 Yield: 97-98%



31-172-CAS-289497

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium
Solvents: Toluene; 3 - 6 h, 100 °C

Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

31-172-CAS-8356688

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-4,5-dihydro-, tetrafluoroborate(1-) (1:1)
Solvents: 1,2-Dimethoxyethane

Experimental Protocols

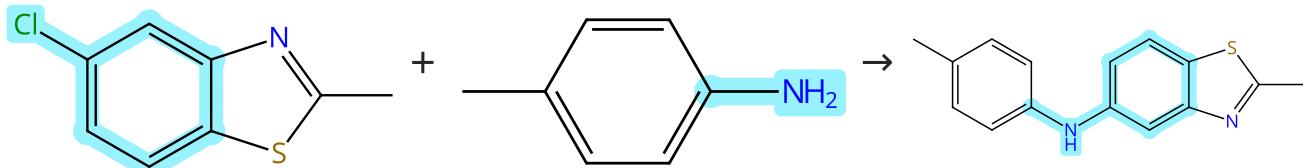
High turnover number and rapid, room-temperature amination of chloroarenes using saturated carbene ligands

By: Stauffer, Shaun R.; et al

Organic Letters (2000), 2(10), 1423-1426.

Scheme 160 (1 Reaction)

Steps: 1 Yield: 98%



31-172-CAS-504205

Steps: 1 Yield: 98%

Efficient Pd-Catalyzed Amination of Heteroaryl Halides

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, X-Phos
Solvents: Toluene; 90 °C; 18 h, 90 °C; 90 °C → rt

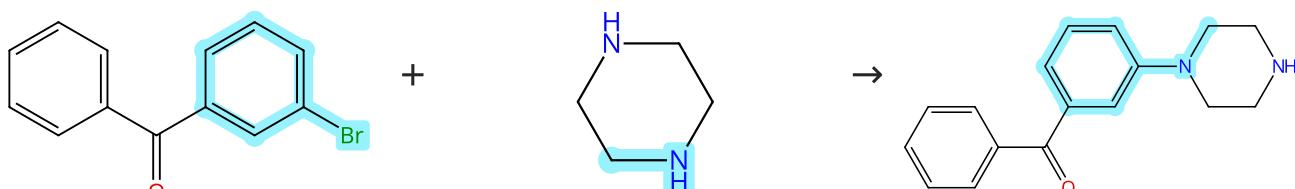
By: Charles, Mark D.; et al

Organic Letters (2005), 7(18), 3965-3968.

Experimental Protocols

Scheme 161 (1 Reaction)

Steps: 1 Yield: 98%



31-172-CAS-9444012

Steps: 1 Yield: 98%

Development of Fluorescent Ligands for the Human 5-HT_{1A} Receptor

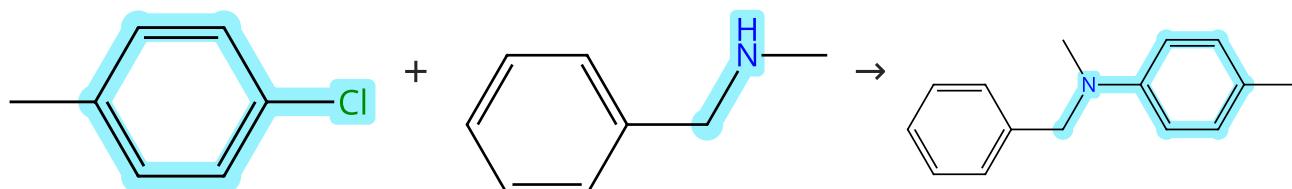
By: Alonso, Dulce; et al

ACS Medicinal Chemistry Letters (2010), 1(6), 249-253.

Experimental Protocols

Scheme 162 (2 Reactions)

Steps: 1 Yield: 96-98%



Suppliers (77)

Suppliers (85)

Suppliers (6)

31-172-CAS-4377266

Steps: 1 Yield: 98%

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

31-172-CAS-14247144

Steps: 1 Yield: 96%

Polymer-incarcerated palladium with active phosphine as recoverable and reusable Pd catalyst for the amination of aryl chlorides

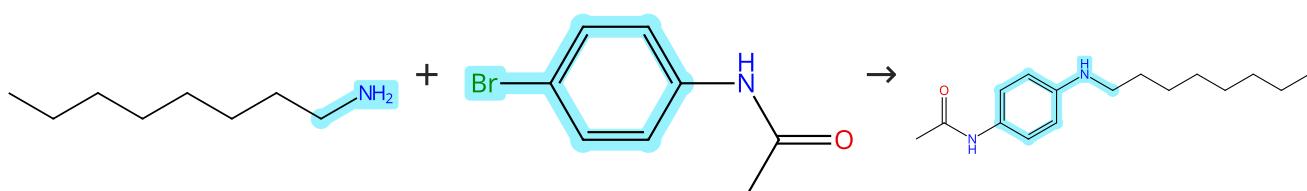
By: Inasaki, Takeshi; et al

Synlett (2007), (20), 3209-3213.

Experimental Protocols

Scheme 163 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (77)

Suppliers (82)

Suppliers (3)

31-172-CAS-3098321

Steps: 1 Yield: 98%

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

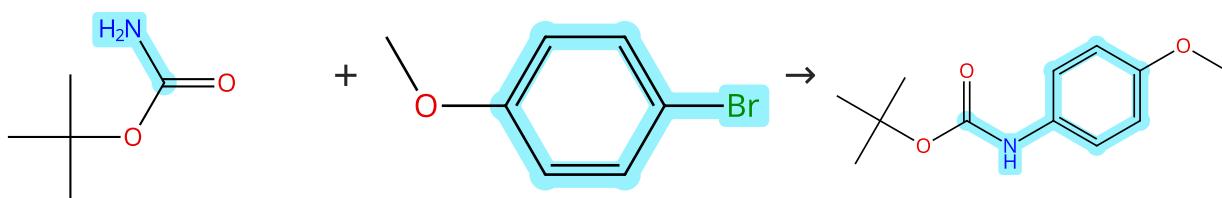
By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Experimental Protocols

Scheme 164 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (100)

Suppliers (79)

Suppliers (65)

31-172-CAS-11173253

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylallyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine

Solvents: *tert*-Butanol; 20 h, 100 °C; 100 °C → rt

Palladium-catalyzed amidation of aryl halides using 2-dialkylphosphino-2'-alkoxyl-1,1'-binaphthyl as ligands

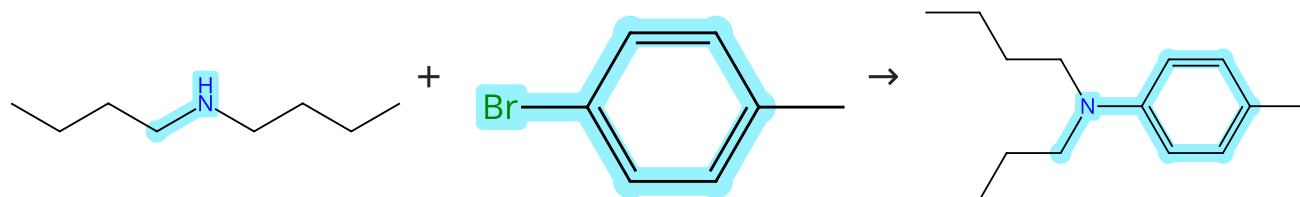
By: Ma, Fangfang; et al

Journal of Organic Chemistry (2012), 77(12), 5279-5285.

Experimental Protocols

Scheme 165 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (63)

Suppliers (69)

Suppliers (2)

31-172-CAS-7113551

Steps: 1 Yield: 98%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 40 min, rt

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

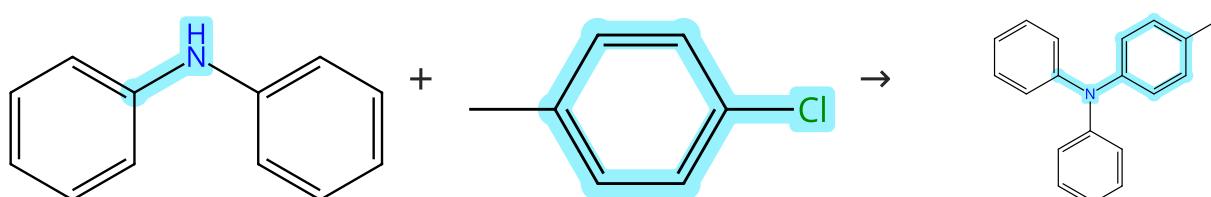
By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Experimental Protocols

Scheme 166 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (108)

Suppliers (77)

Suppliers (70)

31-172-CAS-14302775

Steps: 1 Yield: 98%

Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

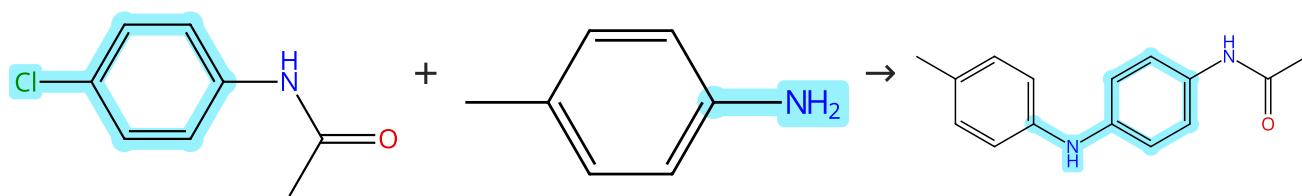
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols

Scheme 167 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (101)

Suppliers (78)

Suppliers (2)

31-172-CAS-3284095

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate

Solvents: *tert*-Butanol, Toluene; 18 h, 110 °C

Experimental Protocols

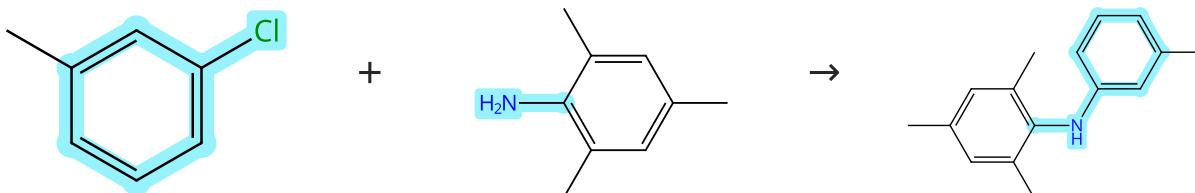
Expanding Pd-Catalyzed C-N Bond-Forming Processes: The First Amidation of Aryl Sulfonates, Aqueous Amination, and Complementarity with Cu-Catalyzed Reactions

By: Huang, Xiaohua; et al

Journal of the American Chemical Society (2003), 125(22), 6653-6655.

Scheme 168 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (68)

Suppliers (85)

Supplier (1)

31-172-CAS-1271593

Steps: 1 Yield: 98%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

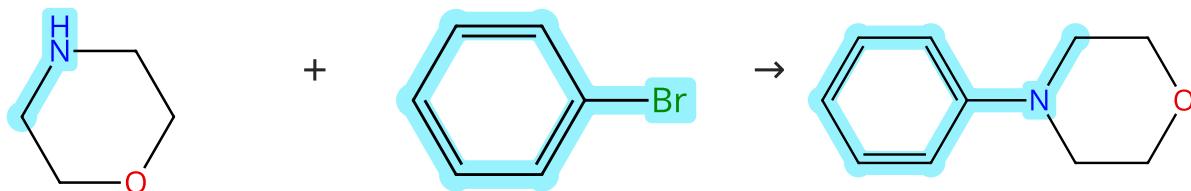
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 169 (2 Reactions)

Steps: 1 Yield: 95-98%



Suppliers (76)

Suppliers (74)

Suppliers (82)

31-172-CAS-9850659

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Tripotassium phosphate, (+)-Naproxen methyl ester
Catalysts: Tri-*tert*-butylphosphine, Bis(dibenzylideneacetone)palladium
Solvents: Tetrahydrofuran; 12 h, 85 °C
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Diethyl ether, Water; neutralized

Experimental Protocols

Zinc trimethylsilylamine as a mild ammonia equivalent and base for the amination of aryl halides and triflates

By: Lee, Dae-Yon; et al

Organic Letters (2005), 7(6), 1169-1172.

31-172-CAS-10411482

Steps: 1 Yield: 95%

- 1.1 **Reagents:** Potassium hydroxide, Water
Catalysts: Hexadecyltrimethylammonium bromide, Bis(tri-*tert*-butylphosphine)palladium
Solvents: Toluene

Experimental Protocols

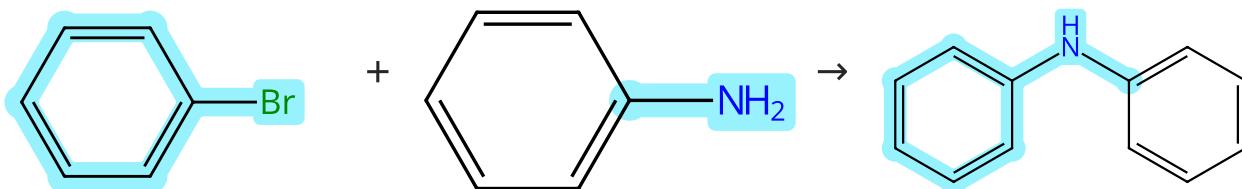
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 170 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (74)

Suppliers (100)

Suppliers (108)

31-172-CAS-3076567

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene
Solvents: Toluene

Experimental Protocols

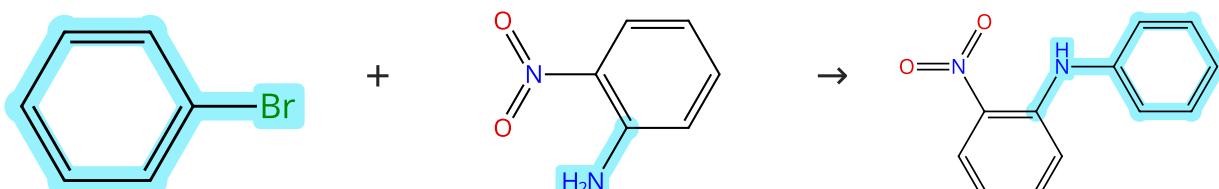
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 171 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (74)

Suppliers (85)

Suppliers (61)

31-172-CAS-13107958

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Cesium carbonate
Catalysts: Bis(dibenzylideneacetone)palladium, BINAP
Solvents: Toluene; 10 min, rt; 48 h, 120 °C

Experimental Protocols

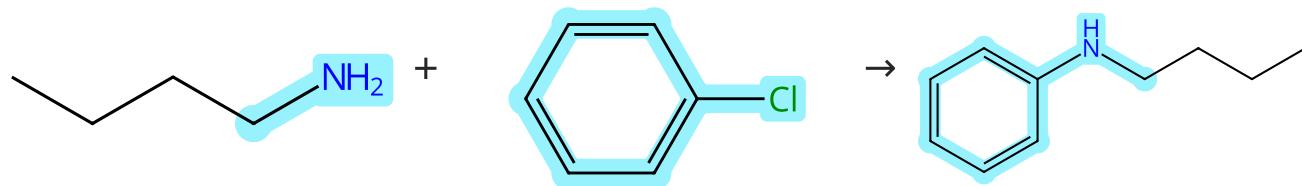
Apparent Alkyl Transfer and Phenazine Formation via an Aryne Intermediate

By: Panagopoulos, Andria M.; et al

Journal of Organic Chemistry (2013), 78(8), 3532-3540.

Scheme 172 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (72)

Suppliers (136)

Suppliers (51)

31-172-CAS-9998320

Steps: 1 Yield: 98%

1.1 Reagents:

Sodium *tert*-butoxide
Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine
Solvents: Toluene; 18 h, 110 °C

Synthesis of Bulky and Electron-Rich MOP-type Ligands and Their Applications in Palladium-Catalyzed C-N Bond Formation

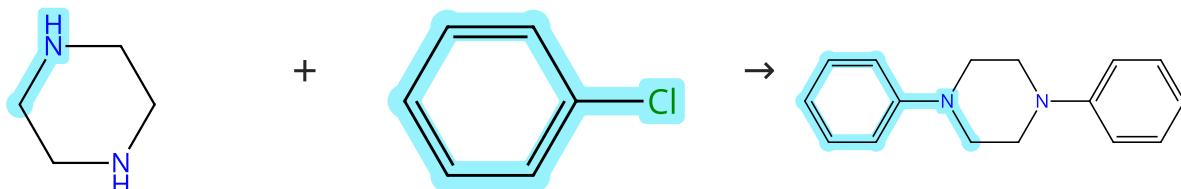
By: Xie, Xiaomin; et al

Journal of Organic Chemistry (2006), 71(17), 6522-6529.

Experimental Protocols

Scheme 173 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (88)

Suppliers (136)

Suppliers (21)

31-172-CAS-4545526

Steps: 1 Yield: 98%

1.1 Reagents:

Potassium carbonate
Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole-*K*N*³*)palladium
Solvents: 1,4-Dioxane; 1 h, 90 °C

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

Scheme 174 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (108)

Suppliers (136)

Suppliers (98)

31-172-CAS-3327347

Steps: 1 Yield: 98%

1.1 Reagents:

Sodium *tert*-butoxide
Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene
Solvents: Toluene

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

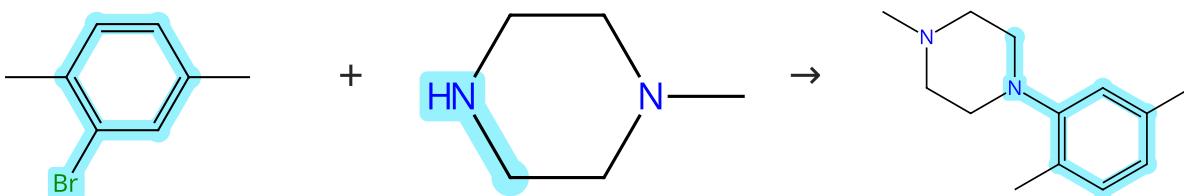
By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Experimental Protocols

Scheme 175 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (89)

Suppliers (106)

Suppliers (3)

31-172-CAS-2295077

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Experimental Protocols

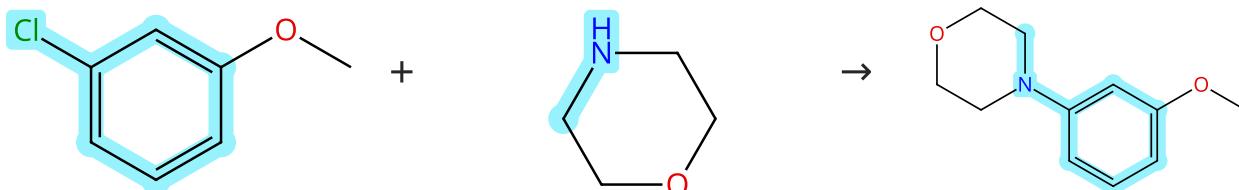
Scope and limitations of the Pd/BINAP-catalyzed amination of aryl bromides

By: Wolfe, John P.; et al

Journal of Organic Chemistry (2000), 65(4), 1144-1157.

Scheme 176 (2 Reactions)

Steps: 1 Yield: 95-98%



Suppliers (82)

Suppliers (76)

Suppliers (14)

31-172-CAS-8905808

Steps: 1 Yield: 98%

1.1 Reagents: Potassium carbonate

Catalysts: (*S,P*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

31-172-CAS-10374280

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 20 h, 100 °C; 100 °C → rt

Experimental Protocols

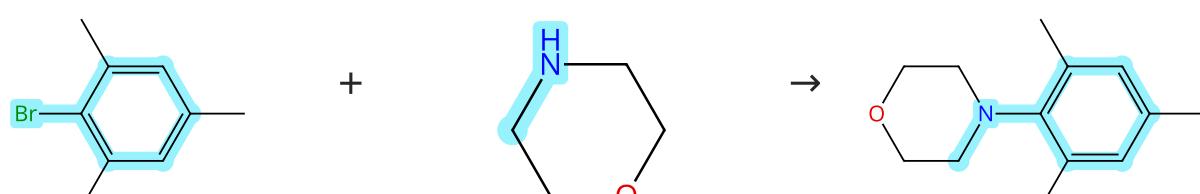
Scope and limitations of $Pd_2(dbu)_3/P(i\text{-}BuNCH}_2\text{CH}_2)_3\text{N}$ -catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Scheme 177 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (93)

Suppliers (76)

Suppliers (3)

31-172-CAS-7440174

Steps: 1 Yield: 98%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 30 min, rt

Experimental Protocols

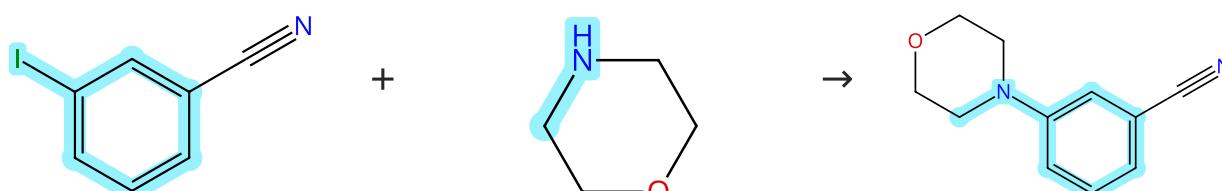
Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 178 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (97)

Suppliers (76)

Suppliers (65)

31-172-CAS-6229538

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; rt; 17 h, reflux

Experimental Protocols

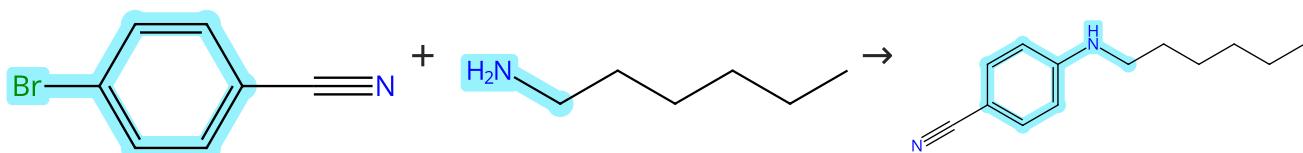
Study of a New Rate Increasing "Base Effect" in the Palladium-Catalyzed Amination of Aryl Iodides

By: Meyers, Caroline; et al

Journal of Organic Chemistry (2004), 69(18), 6010-6017.

Scheme 179 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (105)

Suppliers (69)

Suppliers (12)

31-172-CAS-10598308

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene

Experimental Protocols

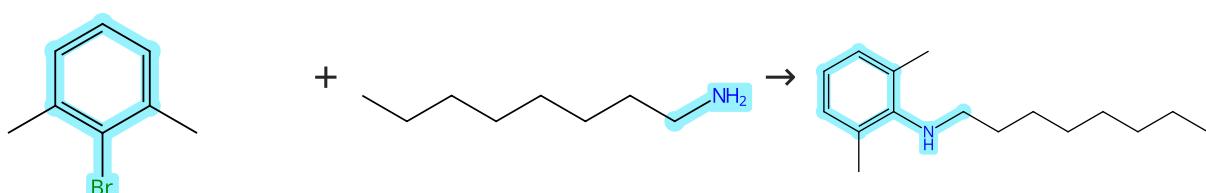
Scope and limitations of the Pd/BINAP-catalyzed amination of aryl bromides

By: Wolfe, John P.; et al

Journal of Organic Chemistry (2000), 65(4), 1144-1157.

Scheme 180 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (97)

Suppliers (77)

Suppliers (7)

31-172-CAS-3414683

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 48 h, 100 °C

Experimental Protocols

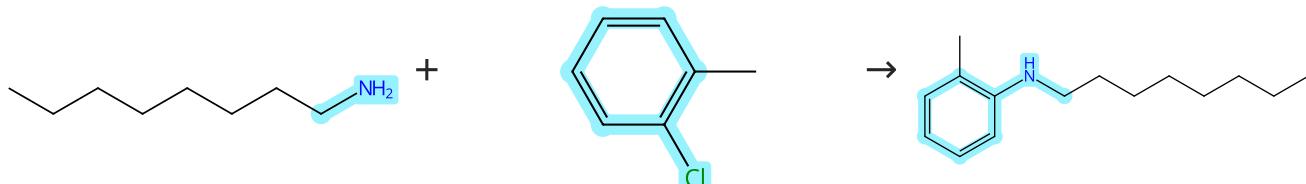
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 181 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (77)

Suppliers (70)

Suppliers (4)

31-172-CAS-4030340

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 48 h, 100 °C

Experimental Protocols

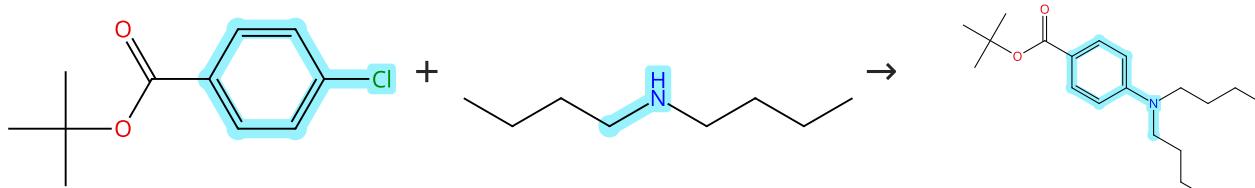
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 182 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (29)

Suppliers (63)

Suppliers (3)

31-172-CAS-6811344

Steps: 1 Yield: 98%

1.1 Reagents: Potassium hydroxide, Water

Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tert*-butylphosphine)palladium

Solvents: Toluene

Experimental Protocols

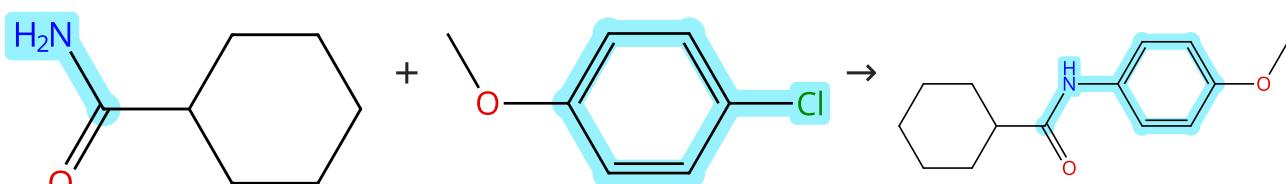
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 183 (2 Reactions)

Steps: 1 Yield: 96-98%



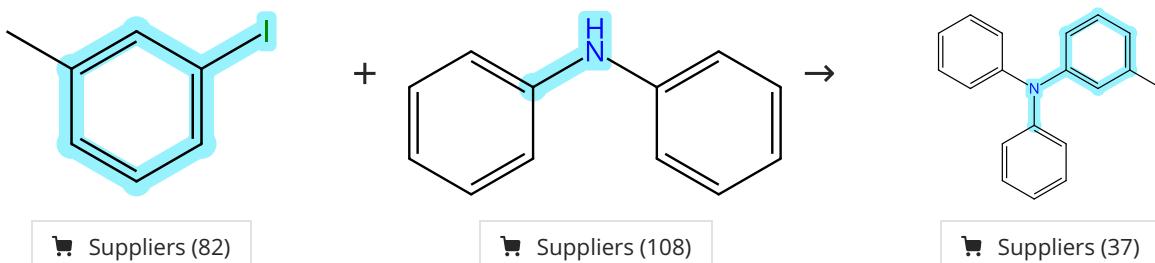
Suppliers (65)

Suppliers (79)

Suppliers (7)

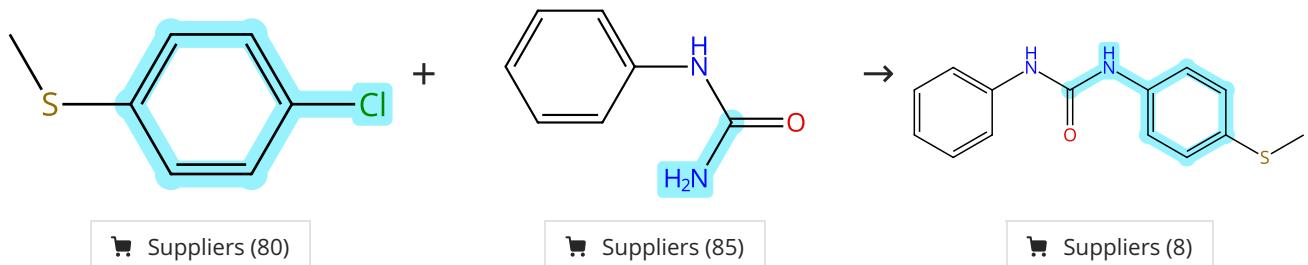
31-172-CAS-5198466	Steps: 1 Yield: 98%	Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions By: Fors, Brett P.; et al Organic Letters (2008), 10(16), 3505-3508.
1.1 Catalysts: Palladium diacetate, Water, Di- <i>tert</i> -butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine Solvents: <i>tert</i> -Butanol; rt → 110 °C; 1.5 min, 110 °C 1.2 Reagents: Tripotassium phosphate; rt → 110 °C; 3 h, 110 °C Experimental Protocols	Steps: 1 Yield: 96%	Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation By: Ikawa, Takashi; et al Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Scheme 184 (1 Reaction)



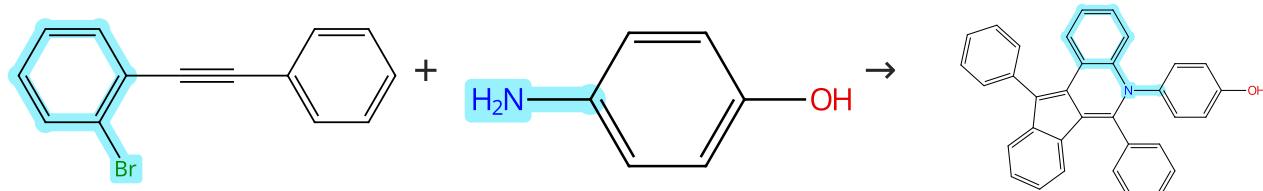
31-172-CAS-7321291	Steps: 1 Yield: 98%	An Improved Method for the Palladium-Catalyzed Amination of Aryl Iodides By: Ali, Mayssam H.; et al Journal of Organic Chemistry (2001), 66(8), 2560-2565.
1.1 Reagents: Sodium <i>tert</i> -butoxide Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9 <i>H</i> -xanthene-4,5-diyl)bis[1,1-diphenylphosphine] Solvents: Toluene Experimental Protocols	Steps: 1 Yield: 98%	

Scheme 185 (1 Reaction)



31-172-CAS-541113	Steps: 1 Yield: 98%	Synthesis of Unsymmetrical Diarylureas via Pd-Catalyzed C-N Cross-Coupling Reactions By: Breitler, Simon; et al Organic Letters (2011), 13(12), 3262-3265.
1.1 Catalysts: Palladium diacetate, Water, [3,6-Dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]bis(1,1-dimethylethyl)phosphine Solvents: Tetrahydrofuran; 4 min, rt → 110 °C 1.2 Reagents: Cesium carbonate; 5 h, rt → 85 °C Experimental Protocols	Steps: 1 Yield: 98%	

Scheme 186 (1 Reaction)



Suppliers (50)

Suppliers (102)

31-172-CAS-7684213

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tricyclohexylphosphine, Palladium diacetate
Solvents: 1,4-Dioxane; reflux

Experimental Protocols

Efficient Synthesis of 5H-Cyclopenta[c]quinoline Derivatives via Palladium-Catalyzed Domino Reactions of *o*-Alkynylhalobenzene with Amine

By: Luo, Yong; et al

Organic Letters (2011), 13(5), 1150-1153.

Scheme 187 (1 Reaction)



Suppliers (79)

Suppliers (76)

Suppliers (3)

31-172-CAS-9827862

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Palladium diacetate, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene

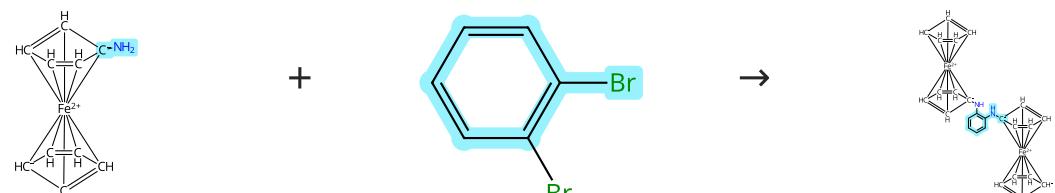
Experimental Protocols

Simple, efficient catalyst system for the palladium-catalyzed amination of aryl chlorides, bromides, and triflates

By: Wolfe, John P.; et al

Journal of Organic Chemistry (2000), 65(4), 1158-1174.

Scheme 188 (1 Reaction)



Suppliers (57)

Suppliers (88)

31-172-CAS-14217450

Steps: 1 Yield: 98%

Redox-Active N-Heterocyclic Carbenes: Design, Synthesis, and Evaluation of their Electronic Properties

By: Rosen, Evelyn L.; et al

Organometallics (2009), 28(23), 6695-6706.

1.1 Catalysts: Sodium *tert*-butoxide, Palladium diacetate, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

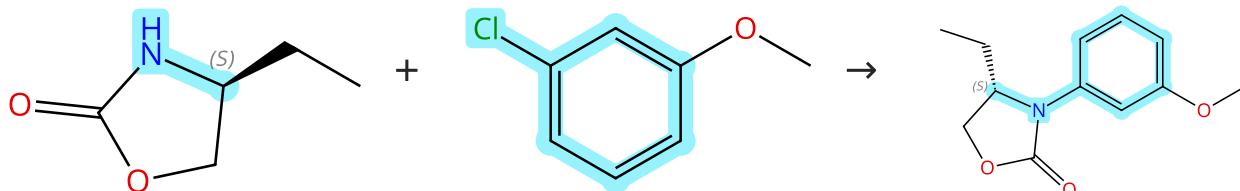
Solvents: Toluene; 10 min, rt

1.2 Reagents: Sodium *tert*-butoxide
Solvents: Toluene; rt; 12 h, 110 °C

Experimental Protocols

Scheme 189 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (40)

Suppliers (82)

Absolute stereochemistry shown

Suppliers (7)

31-172-CAS-14860508

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene; 17 h, 100 °C

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

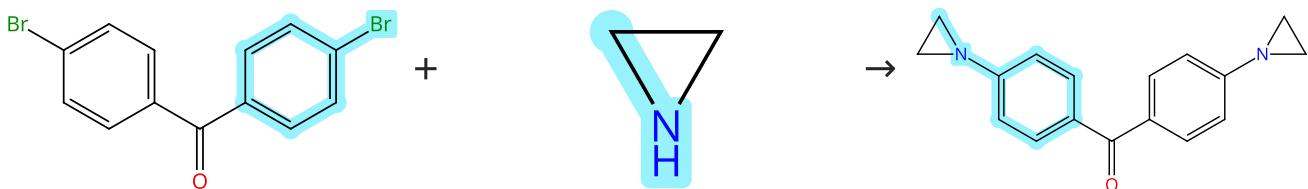
By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Experimental Protocols

Scheme 190 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (95)

Suppliers (9)

31-172-CAS-7226260

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: Toluene; 1 d, 100 °C

Palladium-catalyzed N-arylation reactions with aziridine and azetidine

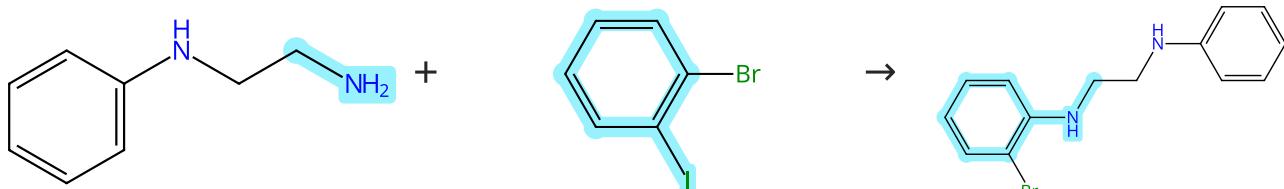
By: Witulski, Bernhard; et al

Synthesis (2007), (2), 243-250.

Experimental Protocols

Scheme 191 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (72)

Suppliers (105)

31-172-CAS-2798339

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: Toluene
1.2 rt; 30 min, 110 °C; 110 °C → rt

Experimental Protocols

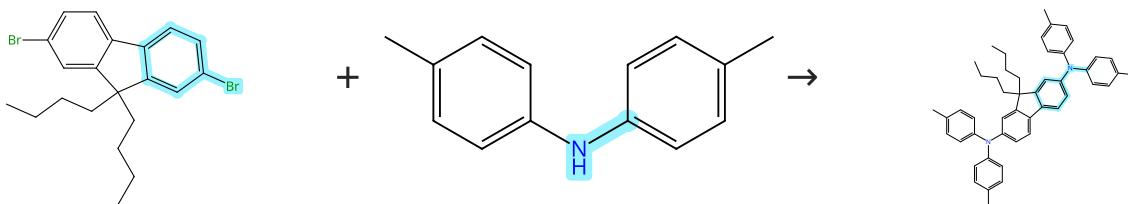
New Phosphine-Functionalized NHC Ligands: Discovery of an Effective Catalyst for the Room-Temperature Amination of Aryl Chlorides with Primary and Secondary Amines

By: Wheaton, Craig A.; et al

Organometallics (2013), 32(21), 6148-6161.

Scheme 192 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (13)

Suppliers (84)

31-172-CAS-8974944

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate
Solvents: Toluene; rt1.2 Catalysts: Tri-*tert*-butylphosphine
Solvents: Toluene; rt → reflux; 13 h, reflux; reflux → rt
1.3 Solvents: Water; rt

Experimental Protocols

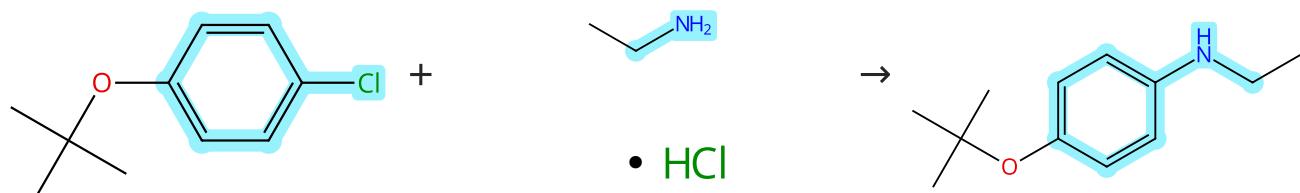
Generation and Spectroscopic Profiles of Stable Multiaryl Iaminium Radical Cations Bridged by Fluorenes

By: Chang, Chao-Che; et al

Organic Letters (2011), 13(10), 2702-2705.

Scheme 193 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (69)

Suppliers (54)

Suppliers (2)

31-172-CAS-12300693

Steps: 1 Yield: 98%

1.1 Catalysts: Palladium diacetate, SL-J009-1
Solvents: 1,4-Dioxane; 5 min, rt1.2 Reagents: Sodium *tert*-butoxide
Solvents: 1,4-Dioxane; 12 h, 80 °C

Experimental Protocols

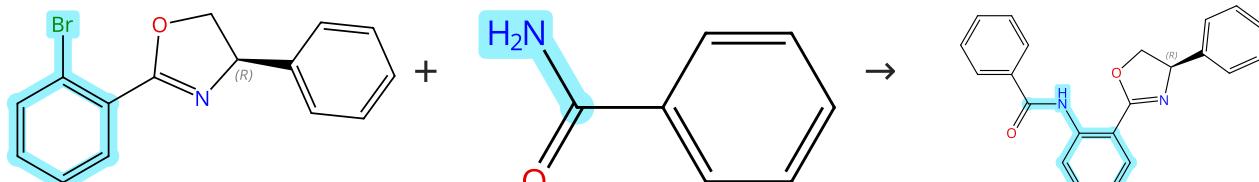
Palladium-Catalyzed Amination of Aryl Chlorides and Bromides with Ammonium Salts

By: Green, Rebecca A.; et al

Organic Letters (2014), 16(17), 4388-4391.

Scheme 194 (1 Reaction)

Steps: 1 Yield: 98%



Absolute stereochemistry shown

Suppliers (30)

Suppliers (109)

Absolute stereochemistry shown,
Rotation (-)

31-172-CAS-7102673

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 20 h, 100 °C

Experimental Protocols

Modular synthesis of chiral β-diketiminato-type ligands containing 2-oxazoline moiety via palladium-catalyzed amination

By: Binda, Pascal I.; et al

Synthesis (2011), (16), 2609-2618.

Scheme 195 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (112)

Suppliers (88)

Suppliers (5)

31-172-CAS-2665528

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Xylene; 24 h, 130 °C

Palladium-mediated N-arylation of heterocyclic diamines: insights into the origin of an unusual chemoselectivity

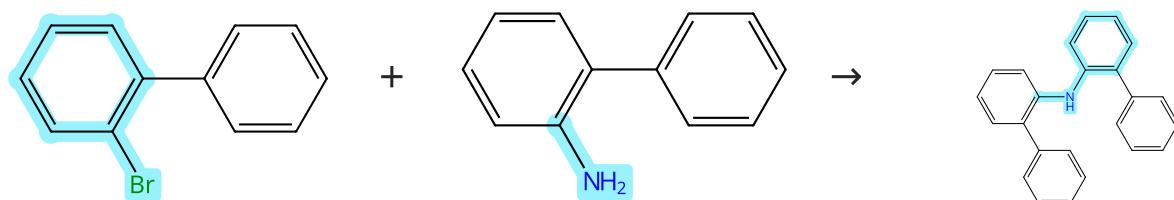
By: Cabello-Sanchez, Noemi; et al

Journal of Organic Chemistry (2007), 72(6), 2030-2039.

Experimental Protocols

Scheme 196 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (96)

Suppliers (76)

Suppliers (6)

31-172-CAS-3102675

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tri-*tert*-butylphosphine, Bis(dibenzylideneacetone)palladium

Solvents: Toluene; 0 °C; 7 h, rt

Synthesis of BN-Fused Polycyclic Aromatics via Tandem Intramolecular Electrophilic Arene Borylation

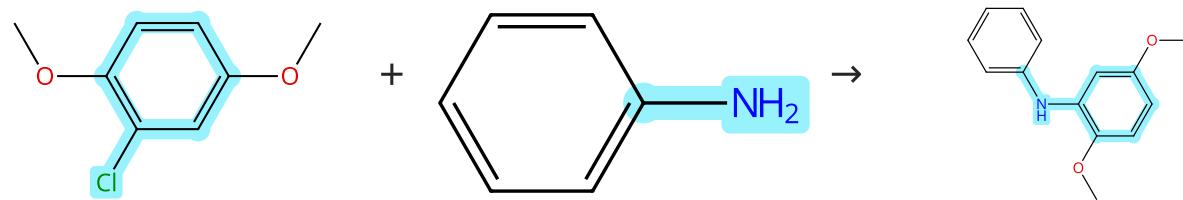
By: Hatakeyama, Takuji; et al

Journal of the American Chemical Society (2011), 133(46), 18614-18617.

Experimental Protocols

Scheme 197 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (74)

Suppliers (100)

Supplier (1)

31-172-CAS-2803001

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: (*SP*-4-4)-[2-[2-(Amino-*k*A)ethyl]phenyl-*k*C]chloro[dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine]palladium

Solvents: 1,4-Dioxane; 2 h, rt

A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

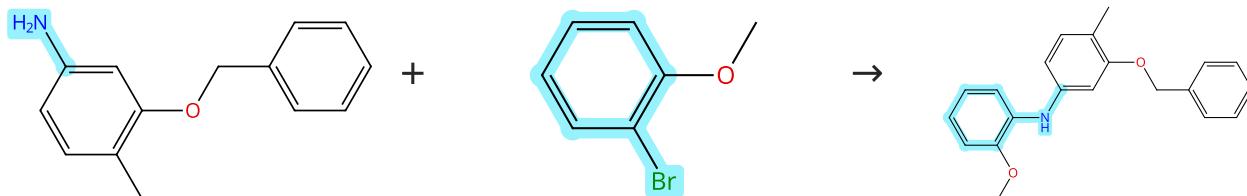
By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

Experimental Protocols

Scheme 198 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (56)

Suppliers (88)

31-172-CAS-14359970

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, X-Phos
Solvents: Toluene; 3 h, reflux; 24 h, reflux

Synthesis of carbalexin B, clausine A, clauszoline M, and 2,8-dihydroxy-3-methylcarbazole

By: Julich-Gruner, Konstanze K.; et al

Synthesis (2014), 46(19), 2651-2655.

Experimental Protocols

Scheme 199 (2 Reactions)

Steps: 1 Yield: 98%



Suppliers (18)

Suppliers (92)

31-172-CAS-7950792

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; 2 h, 110 °C

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Experimental Protocols

31-172-CAS-9256613

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene, Hexane; 30 min, rt; 2 h, 110 °C

Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

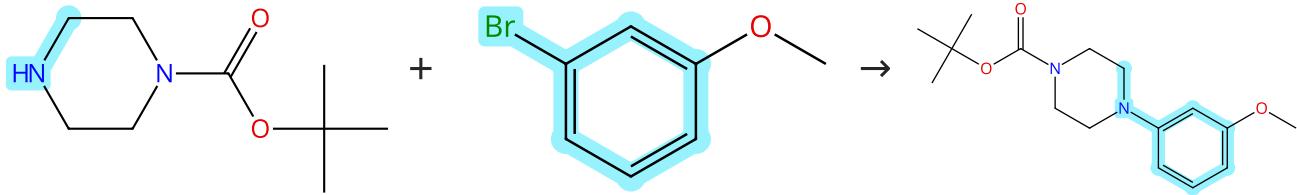
By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Experimental Protocols

Scheme 200 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (130)

Suppliers (91)

Suppliers (27)

31-172-CAS-3501028

Steps: 1 Yield: 98%

1.1 Reagents: Potassium *tert*-butoxide
Catalysts: Tri-*tert*-butylphosphine, Tris(dibenzylideneacetone) dipalladium
Solvents: Toluene; rt; 16 h, 110 °C; 110 °C → rt

1-Substituted 4-(3-Hydroxyphenyl)piperazines Are Pure Opioid Receptor Antagonists

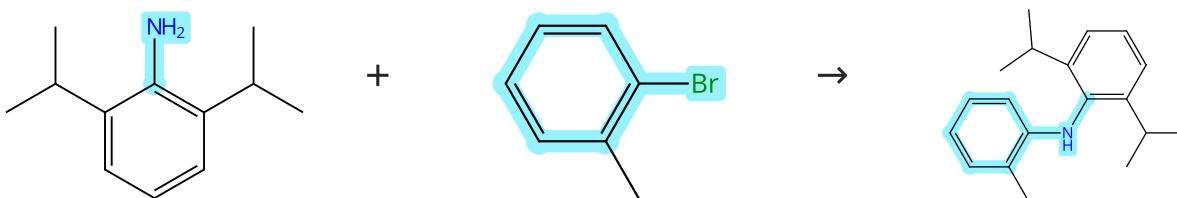
By: Carroll, F. Ivy; et al

ACS Medicinal Chemistry Letters (2010), 1(7), 365-369.

Experimental Protocols

Scheme 201 (2 Reactions)

Steps: 1 Yield: 96-98%



Suppliers (92)

Suppliers (65)

Suppliers (6)

31-172-CAS-5255608

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 50 °C

Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

31-172-CAS-8917295

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 90 min, rt

Experimental Protocols

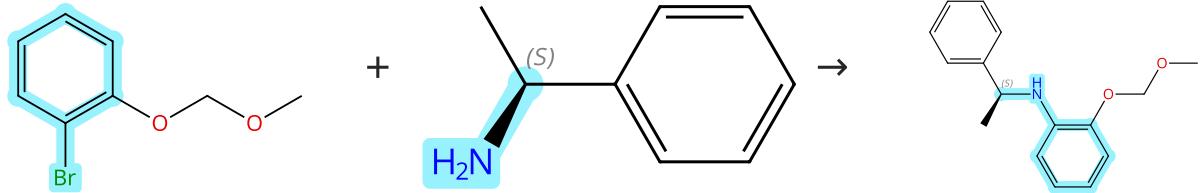
Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 202 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (47)

Suppliers (100)

31-172-CAS-7805245

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; rt; rt; 4 h, 70 °C

Experimental Protocols

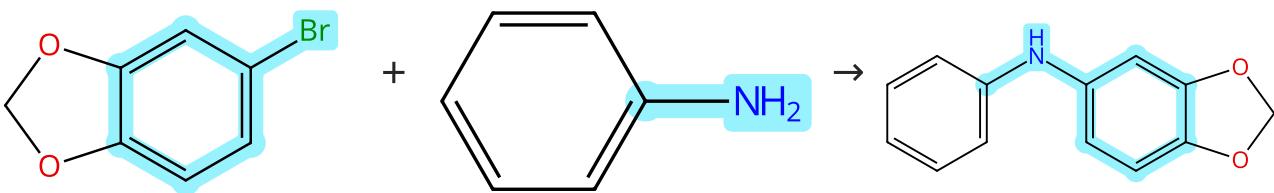
Development of new chiral auxiliary derived from (S)-(-)-phenylethylamine for a synthesis of enantiopure (R)-2-propyloctanoic acid

By: Hasegawa, Tomoyuki; et al

Synthesis (2003), (8), 1181-1186.

Scheme 203 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (101)

Suppliers (100)

Suppliers (7)

31-172-CAS-7817342

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine

Solvents: Toluene; rt; 16 h, 110 °C

Experimental Protocols

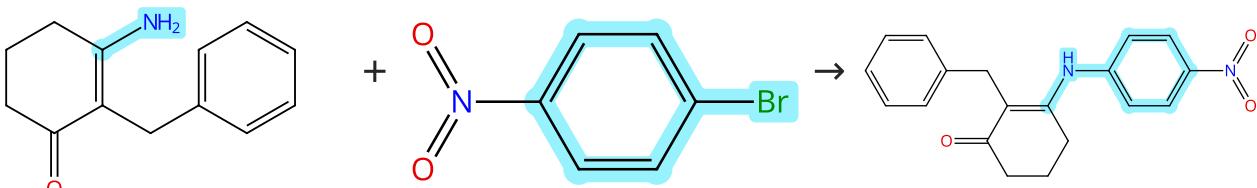
Synthesis of Bulky and Electron-Rich MOP-type Ligands and Their Applications in Palladium-Catalyzed C-N Bond Formation

By: Xie, Xiaomin; et al

Journal of Organic Chemistry (2006), 71(17), 6522-6529.

Scheme 204 (1 Reaction)

Steps: 1 Yield: 98%



Supplier (1)

Suppliers (84)

31-172-CAS-7907058

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

Experimental Protocols

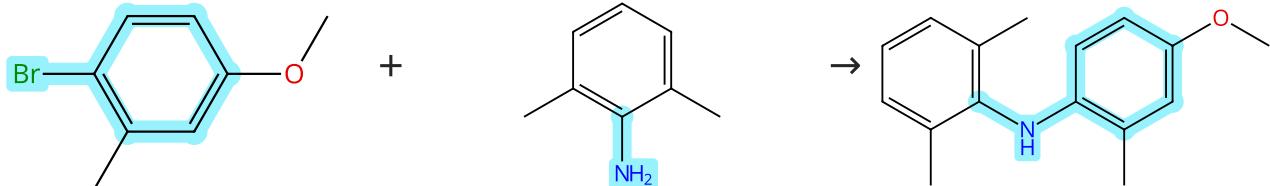
Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 205 (1 Reaction)

Steps: 1 Yield: 98%



Supplier (88)

Suppliers (92)

Supplier (2)

31-172-CAS-2017592

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

Experimental Protocols

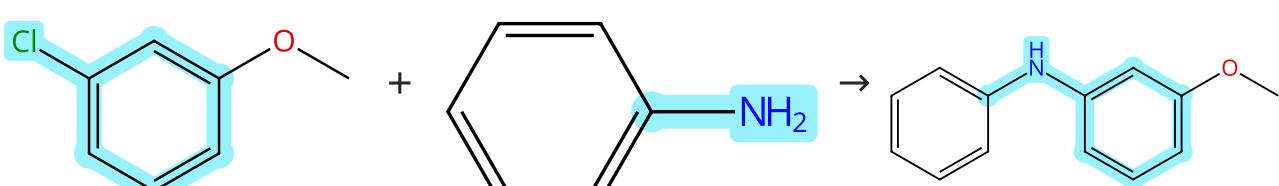
P(*i*-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 206 (1 Reaction)

Steps: 1 Yield: 98%



Supplier (82)

Suppliers (100)

Supplier (72)

31-172-CAS-5859701

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 80 °C

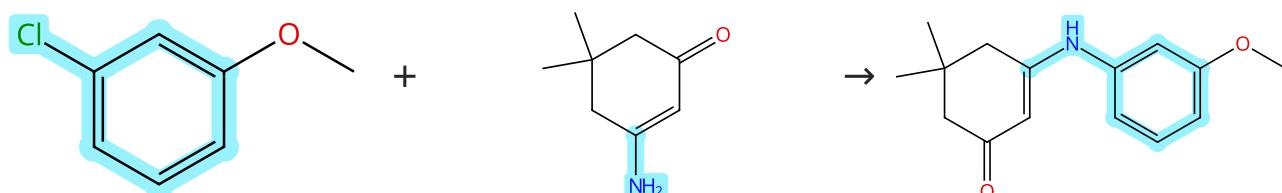
Experimental Protocols

P[N(i-Bu)CH₂CH₂]₃N: A Versatile Ligand for the Pd-Catalyzed Amination of Aryl Chlorides

By: Urgaonkar, Sameer; et al

Organic Letters (2003), 5(6), 815-818.

Scheme 207 (1 Reaction)



Suppliers (82)

Suppliers (67)

Suppliers (10)

31-172-CAS-8237330

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

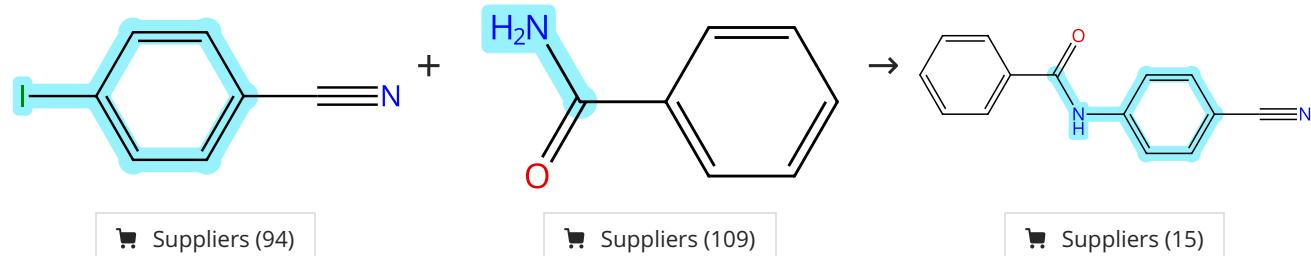
Experimental Protocols

Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 208 (2 Reactions)



Suppliers (94)

Suppliers (109)

Suppliers (15)

31-172-CAS-11289922

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Catalysts: Palladium diacetate

Solvents: 1,4-Dioxane

Experimental Protocols

Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

31-172-CAS-7976422

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Tetrahydrofuran

Experimental Protocols

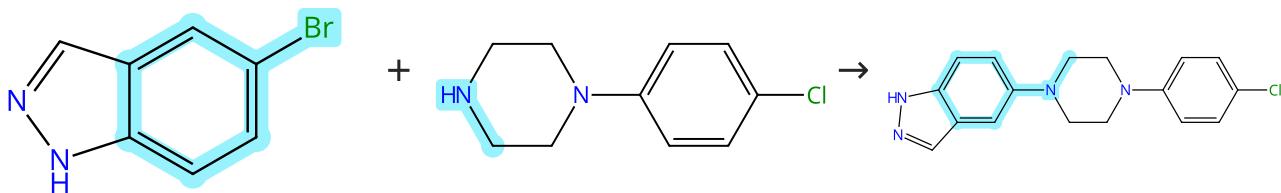
Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Scheme 209 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (111)

Suppliers (72)

Supplier (1)

31-172-CAS-12357818

Steps: 1 Yield: 98%

Efficient Pd-catalyzed amination reactions for heterocycle functionalization

1.1 Reagents: Lithium bis(trimethylsilyl)amide

Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Nethyl)phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium

Solvents: Tetrahydrofuran; 4 h, 65 °C; 65 °C → rt

1.2 Reagents: Hydrochloric acid

Solvents: Water; rt

1.3 Reagents: Sodium bicarbonate

Solvents: Ethyl acetate, Water; rt

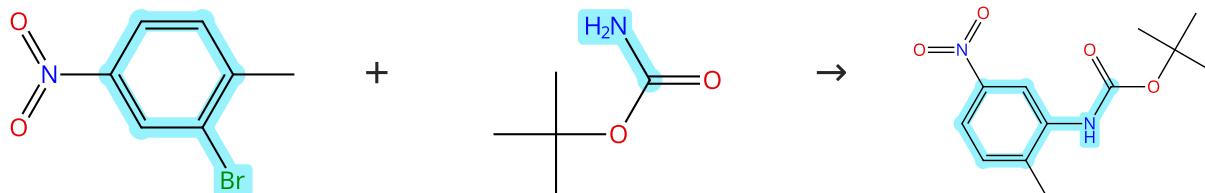
Experimental Protocols

By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Scheme 210 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (106)

Suppliers (100)

Suppliers (8)

31-172-CAS-5021116

Steps: 1 Yield: 98%

"Nok": A Phytosterol-Based Amphiphile Enabling Transition-Metal-Catalyzed Couplings in Water at Room Temperature

By: Klumphu, Piyatida; et al

Journal of Organic Chemistry (2014), 79(3), 888-900.

1.1 Reagents: Potassium hydroxide, 1,1,1-Tris(1-methylethyl)silanol, Poly(oxy-1,2-ethanediyl), α -[4-[3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)-2H-1-benzopyran-6-yl]oxy]-1,4-dioxobutyl]- ω -methoxy-

Catalysts: Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, Bis(1,1-dimethylethyl)(1-methyl-2,2-diphenylcyclopropyl)phosphine

Solvents: Water; 15 h, rt

Experimental Protocols

Scheme 211 (1 Reaction)

Steps: 1 Yield: 98%

The reaction shows the cyclization of a substituted amide, leading to a fused heterocyclic product.

Supplier (1)

Suppliers (4)

31-172-CAS-3687060

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Sodium hydroxide
Catalysts: Triphenylphosphine, Tris(dibenzylideneacetone) dipalladium
Solvents: 1,2-Dimethoxyethane, Water; 17 min, 160 °C
- 1.2 **Reagents:** Amberlyst 15
Solvents: Dichloromethane; 18 h, rt
- 1.3 **Reagents:** Triethylamine
Solvents: Dichloromethane; 1 h, rt

Experimental Protocols

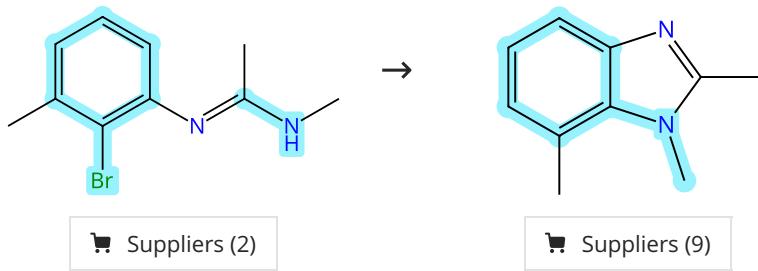
An Improved Procedure for the Synthesis of Benzimid azoles, Using Palladium-Catalyzed Aryl-Amination Chemistry

By: Brain, Christopher T.; et al

Journal of Organic Chemistry (2003), 68(17), 6814-6816.

Scheme 212 (1 Reaction)

Steps: 1 Yield: 98%



31-172-CAS-14970598

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Sodium hydroxide
Catalysts: Triphenylphosphine, Tris(dibenzylideneacetone) dipalladium
Solvents: 1,2-Dimethoxyethane, Water; 17 min, 160 °C
- 1.2 **Reagents:** Amberlyst 15
Solvents: Dichloromethane; 18 h, rt
- 1.3 **Reagents:** Triethylamine
Solvents: Dichloromethane; 1 h, rt

Experimental Protocols

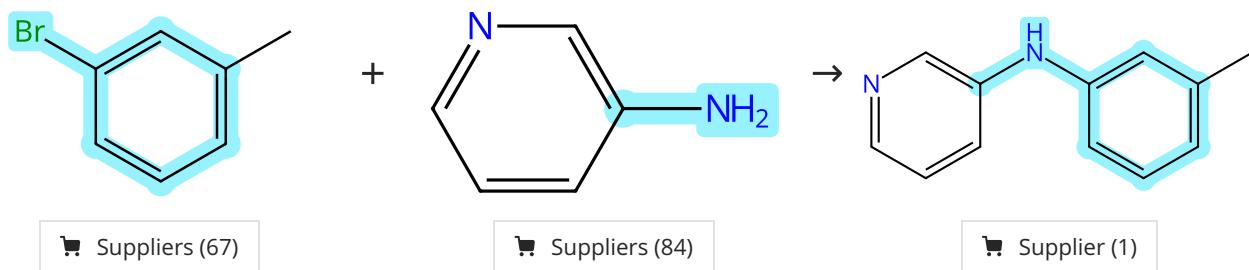
An Improved Procedure for the Synthesis of Benzimid azoles, Using Palladium-Catalyzed Aryl-Amination Chemistry

By: Brain, Christopher T.; et al

Journal of Organic Chemistry (2003), 68(17), 6814-6816.

Scheme 213 (1 Reaction)

Steps: 1 Yield: 98%



31-172-CAS-1395258

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Triethylamine, Potassium *tert*-butoxide
Catalysts: Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, Bis(1,1-dimethylethyl)(1-methyl-2,2-diphenylcyclopropyl)phosphine, Poly(oxy-1,2-ethanediyl), α -[4-[[3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)-2H-1-benzopyran-6-yl]oxy]-1,4-dioxobutyl]- ω -methoxy-

Solvents: Water; 20 h, rt

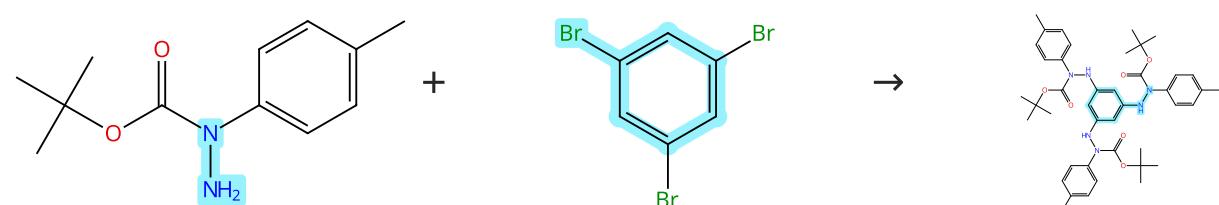
Experimental Protocols

TPGS-750-M: A Second-Generation Amphiphile for Metal-Catalyzed Cross-Couplings in Water at Room Temperature

By: Lipshutz, Bruce H.; et al

Journal of Organic Chemistry (2011), 76(11), 4379-4391.

Scheme 214 (1 Reaction)



Suppliers (9)

Suppliers (92)

31-172-CAS-11446088

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine

Solvents: Toluene, Hexane; 30 min, rt; 2 h, 110 °C

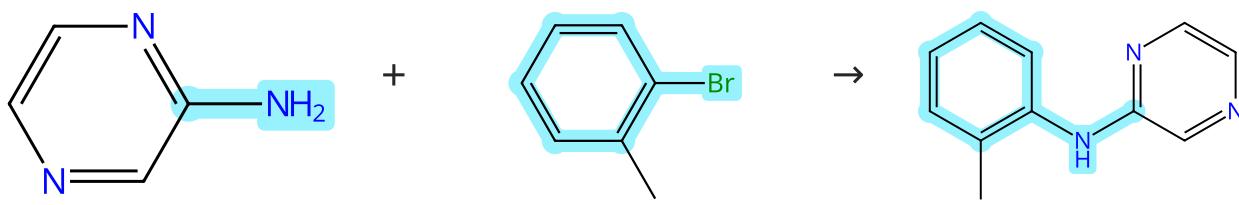
Experimental Protocols

Synthesis of Novel 1,3,5-Tris(arylazo)benzenes via Pd-Catalyzed Couplings and Cu(I)-Mediated Direct Oxidations

By: Lim, Young-Kwan; et al

Journal of Organic Chemistry (2004), 69(7), 2603-2606.

Scheme 215 (1 Reaction)



Suppliers (107)

Suppliers (65)

Suppliers (3)

31-172-CAS-5386750

Steps: 1 Yield: 98%

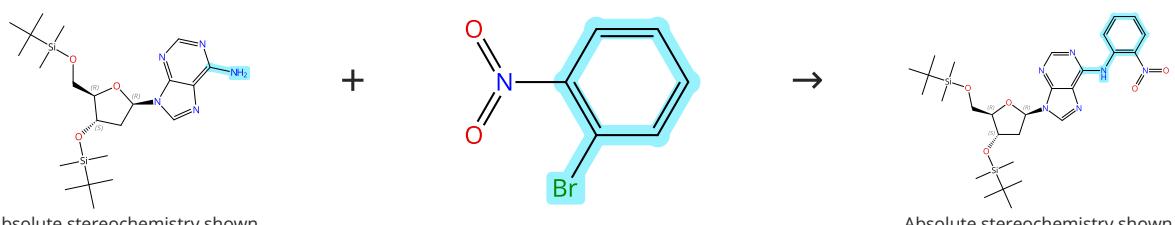
Pd-Catalyzed N-Arylation of Heteroarylamines

By: Yin, Jingjun; et al

Organic Letters (2002), 4(20), 3481-3484.

Experimental Protocols

Scheme 216 (1 Reaction)

Absolute stereochemistry shown,
Rotation (-)

Suppliers (72)

Absolute stereochemistry shown

Suppliers (41)

31-172-CAS-9633114

Steps: 1 Yield: 98%

Pd-Xantphos-Catalyzed Direct Arylation of Nucleosides

By: Ngassa, Felix N.; et al

Organic Letters (2006), 8(20), 4613-4616.

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene; 10 min, rt

1.2 Reagents: Cesium carbonate; 1 h, 90 °C; cooled

Experimental Protocols

Scheme 217 (1 Reaction)



31-172-CAS-11760054

Steps: 1 Yield: 98%

1.1 **Catalysts:** Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: Toluene; 10 min, rt

1.2 **Reagents:** Cesium carbonate; 47 h, 90 °C; cooled

Experimental Protocols

Pd-Xantphos-Catalyzed Direct Arylation of Nucleosides

By: Ngassa, Felix N.; et al

Organic Letters (2006), 8(20), 4613-4616.

Scheme 218 (1 Reaction)



31-172-CAS-3458688

Steps: 1 Yield: 98%

1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: Toluene; 10 min, rt; 24 h, 140 °C

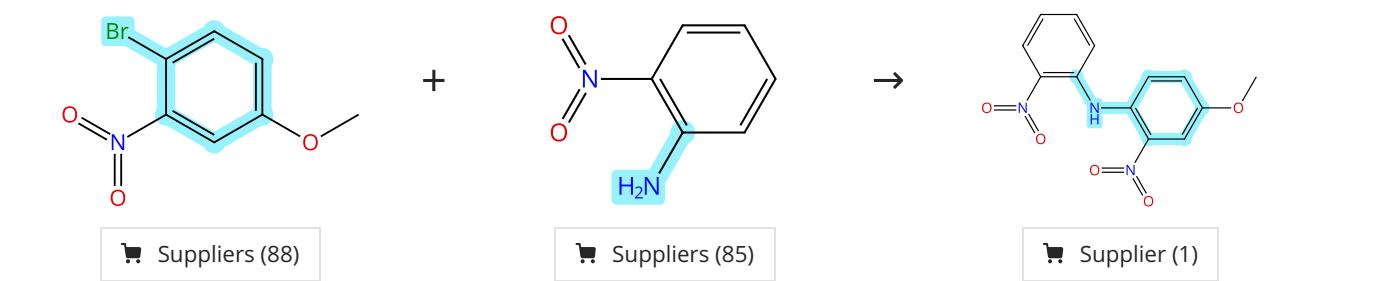
Experimental Protocols

Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Scheme 219 (1 Reaction)



31-172-CAS-15227562

Steps: 1 Yield: 98%

1.1 **Reagents:** Cesium carbonate, BINAP
Catalysts: Tris(dibenzylideneacetone)dipalladium
Solvents: Toluene; 30 h, 110 °C; 110 °C → rt

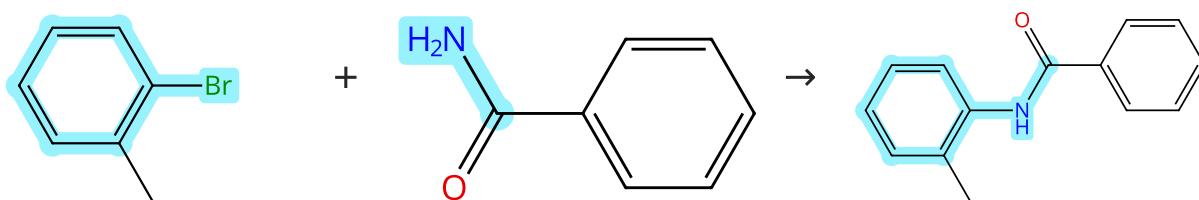
Experimental Protocols

Efficient Methods for the Synthesis of 2-Hydroxyphenazine Based on the Pd-Catalyzed N-Arylation of Aryl Bromides

By: Tietze, Mario; et al

Organic Letters (2005), 7(8), 1549-1552.

Scheme 220 (1 Reaction)



Suppliers (65)

Suppliers (109)

Suppliers (42)

31-172-CAS-4384199

Steps: 1 Yield: 98%

1.1 **Reagents:** Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Catalysts: Tris(dibenzylideneacetone)dipalladium
Solvents: 1,4-Dioxane

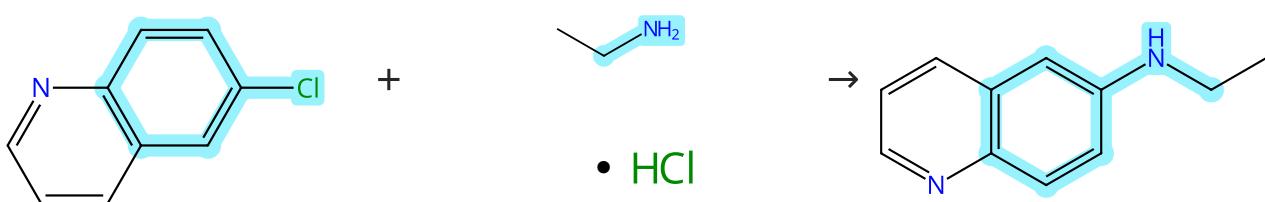
Experimental Protocols

Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

Scheme 221 (1 Reaction)



Suppliers (92)

Suppliers (54)

Suppliers (6)

31-172-CAS-3459014

Steps: 1 Yield: 98%

1.1 **Catalysts:** Palladium diacetate, SL-J009-1
Solvents: 1,4-Dioxane; 5 min, rt

1.2 **Reagents:** Sodium *tert*-butoxide
Solvents: 1,4-Dioxane; 12 h, 80 °C

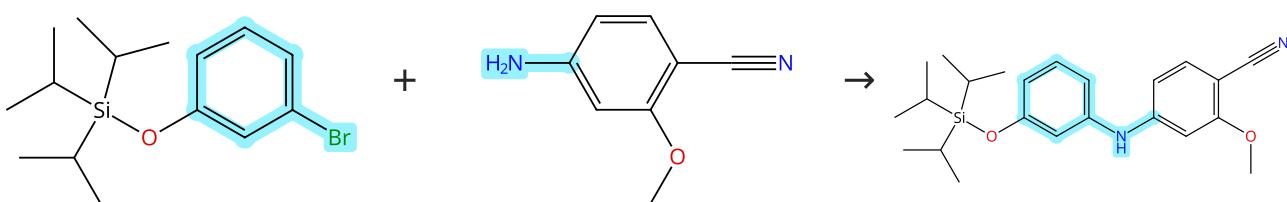
Palladium-Catalyzed Amination of Aryl Chlorides and Bromides with Ammonium Salts

By: Green, Rebecca A.; et al

Organic Letters (2014), 16(17), 4388-4391.

Experimental Protocols

Scheme 222 (1 Reaction)



Suppliers (21)

Suppliers (75)

31-172-CAS-15363475

Steps: 1 Yield: 98%

1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, 2-Dicyclohexylphosphino-2',6'-dimethoxybiphenyl
Solvents: Toluene; 20 h, 100 °C

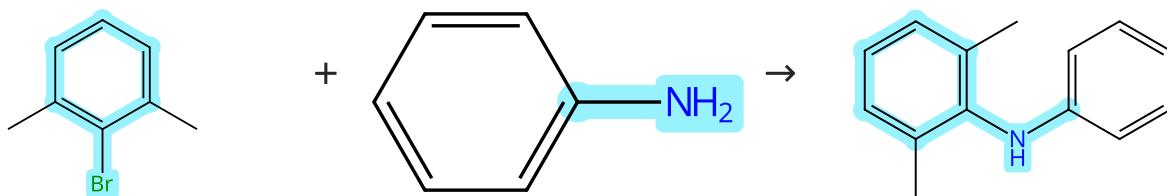
Transition metals in organic synthesis. Part 87. An efficient palladium-catalyzed route to 2-oxygenated and 2,7-dioxygenated carbazole alkaloids - total synthesis of 2-methoxy-3-methylcarbazole, glycosinine, clausine L, mukonidine, and clausine V

By: Forke, Ronny; et al

Synlett (2008), (12), 1870-1876.

Experimental Protocols

Scheme 223 (1 Reaction)



Suppliers (97)

Suppliers (100)

Suppliers (8)

31-172-CAS-14612846

Steps: 1 Yield: 98%

1.1 Reagents: Potassium hydroxide, Water
Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tri-tert*-butylphosphine)palladium
Solvents: Toluene

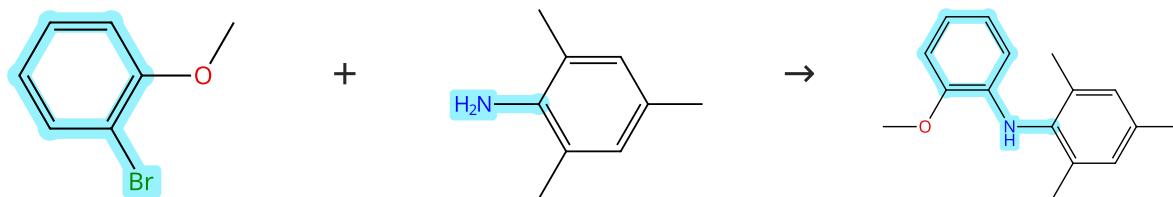
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Experimental Protocols

Scheme 224 (1 Reaction)



Suppliers (88)

Suppliers (85)

Suppliers (4)

31-172-CAS-1003524

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium
Solvents: Toluene; 3 - 6 h, 50 °C

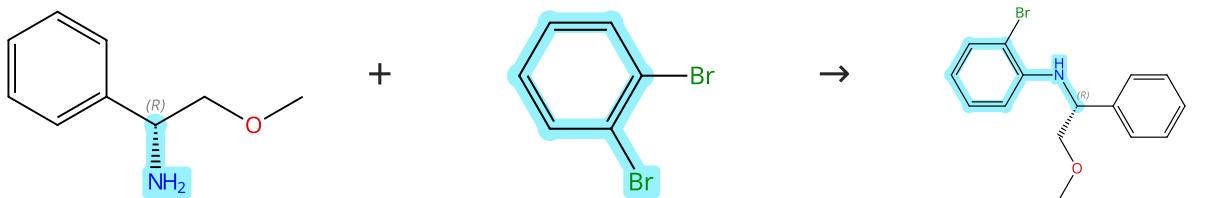
Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Experimental Protocols

Scheme 225 (1 Reaction)

Absolute stereochemistry shown,
Rotation (-)

Suppliers (88)

Absolute stereochemistry shown

Suppliers (57)

31-172-CAS-5997976

Steps: 1 Yield: 98%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene

A Versatile Synthesis of Substituted Benzimidazolium Salts by an Amination/Ring Closure Sequence

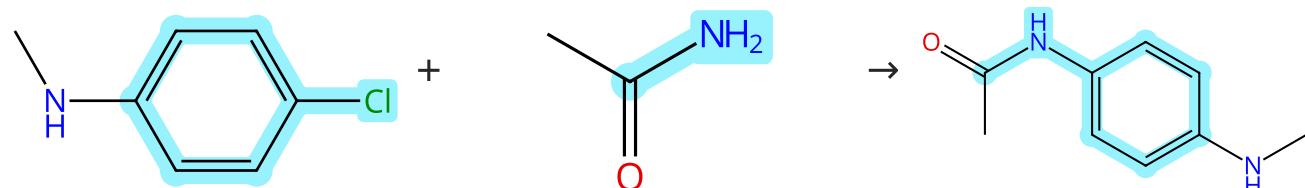
By: Rivas, Felix M.; et al

Organic Letters (2001), 3(17), 2673-2676.

Experimental Protocols

Scheme 226 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (69)

Suppliers (97)

Suppliers (33)

31-172-CAS-9642972

Steps: 1 Yield: 98%

1.1 Reagents: Tripotassium phosphate
Catalysts: Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine
Solvents: *tert*-Butanol; 24 h, 110 °C

Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation

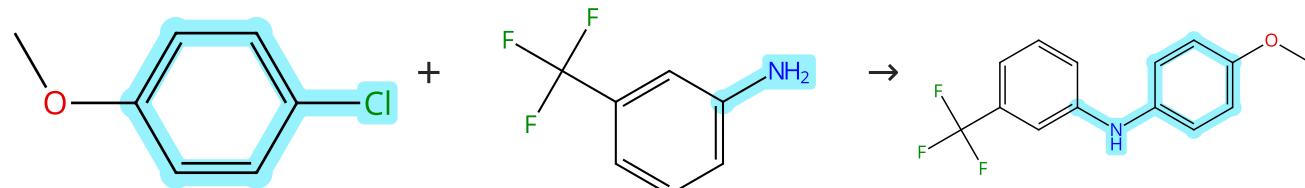
By: Ikawa, Takashi; et al

Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Experimental Protocols

Scheme 227 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (79)

Suppliers (76)

Suppliers (50)

31-172-CAS-917707

Steps: 1 Yield: 98%

1.1 Catalysts: Palladium diacetate, Water, X-Phos
Solvents: 1,4-Dioxane; rt → 80 °C; 1 min, 80 °C
1.2 Reagents: Sodium *tert*-butoxide
Solvents: 1,4-Dioxane; rt → 110 °C; 1 h, 110 °C

Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions

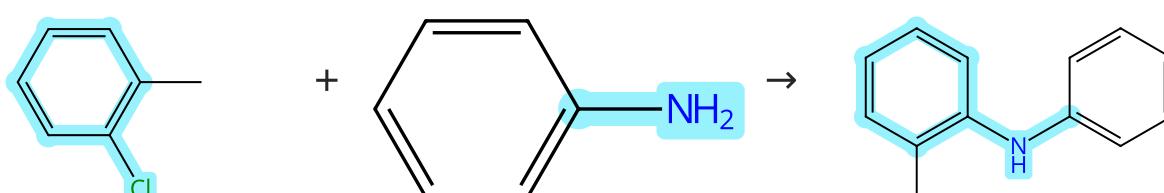
By: Fors, Brett P.; et al

Organic Letters (2008), 10(16), 3505-3508.

Experimental Protocols

Scheme 228 (2 Reactions)

Steps: 1 Yield: 97-98%



Suppliers (70)

Suppliers (100)

Suppliers (57)

31-172-CAS-8751182

Steps: 1 Yield: 98%

1.1 Reagents: Potassium carbonate
Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole-*KN*³⁻)palladium
Solvents: 1,4-Dioxane; 1 h, 90 °C

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

31-172-CAS-8636968

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

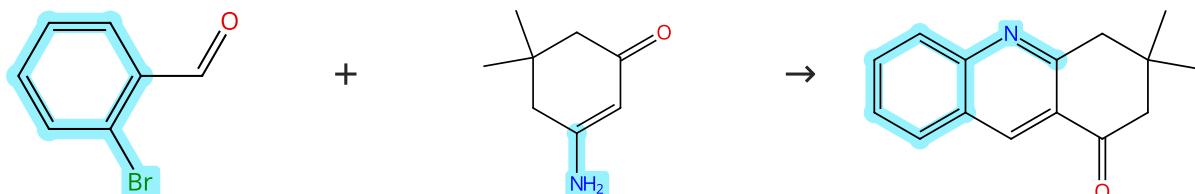
Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 229 (1 Reaction)



Suppliers (98)

Suppliers (67)

Steps: 1 Yield: 98%

Suppliers (13)

31-172-CAS-2711049

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

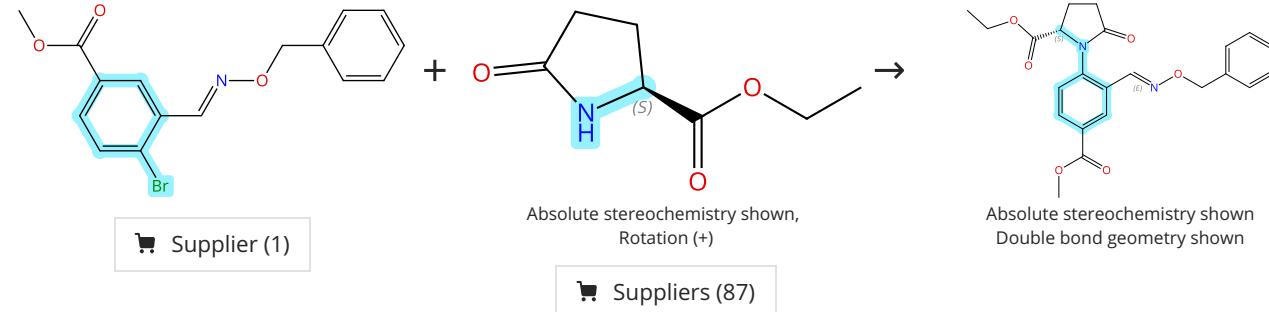
Experimental Protocols

Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 230 (1 Reaction)



Supplier (1)

Suppliers (87)

Steps: 1 Yield: 98%

Absolute stereochemistry shown
Double bond geometry shown

31-172-CAS-15110593

Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 8 h, 100 °C

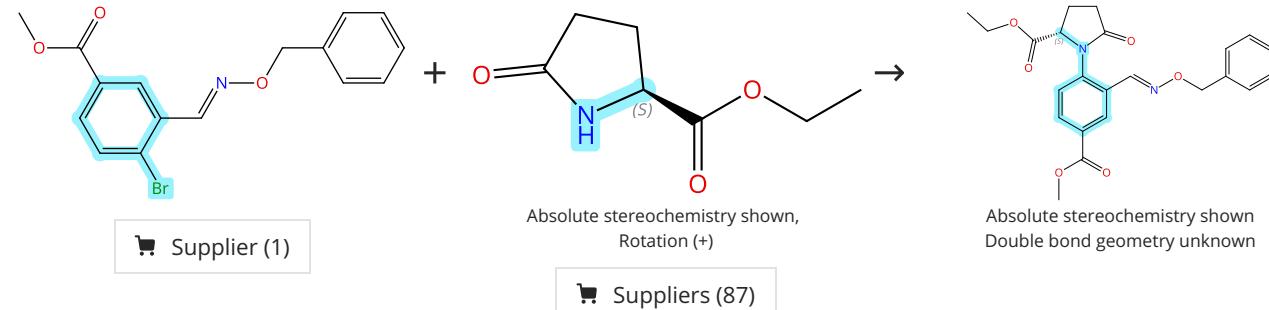
Experimental Protocols

Total Synthesis of (-)-Martinellie Acid via Radical Addition-Cyclization-Elimination Reaction

By: Shirai, Atsushi; et al

Journal of Organic Chemistry (2008), 73(12), 4464-4475.

Scheme 231 (1 Reaction)



Supplier (1)

Suppliers (87)

Steps: 1 Yield: 98%

Absolute stereochemistry shown
Double bond geometry unknown

31-172-CAS-8213206

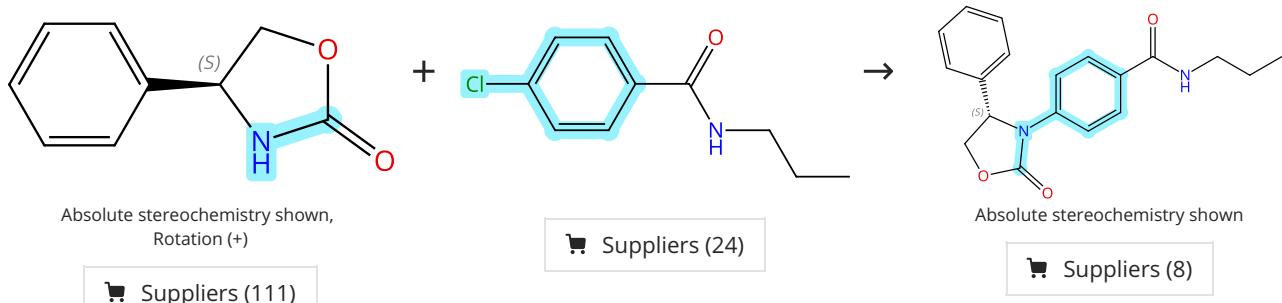
Steps: 1 Yield: 98%

1.1 Reagents: Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: 1,4-Dioxane; 100 °C

Experimental Protocols

An improved synthesis of (-)-martinellic acid via radical addition-cyclization-elimination reaction of chiral oxime ether
 By: Miyata, Okiko; et al
 Synlett (2006), (6), 893-896.

Scheme 232 (1 Reaction)



31-172-CAS-12541675

Steps: 1 Yield: 98%

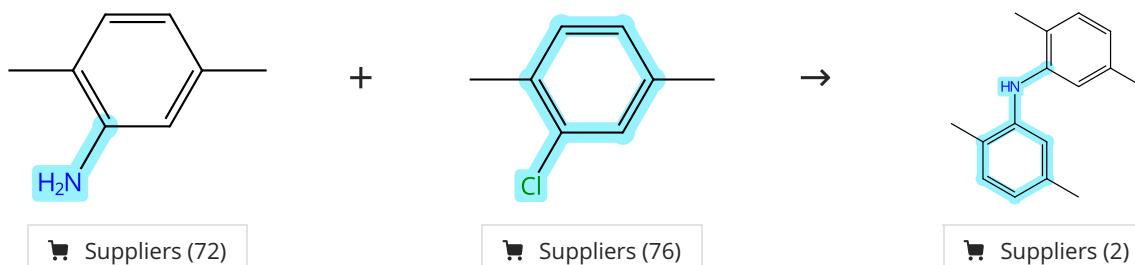
1.1 Reagents: Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene; 18 h, 115 °C

Experimental Protocols

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides
 By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Scheme 233 (1 Reaction)



31-172-CAS-14309950

Steps: 1 Yield: 98%

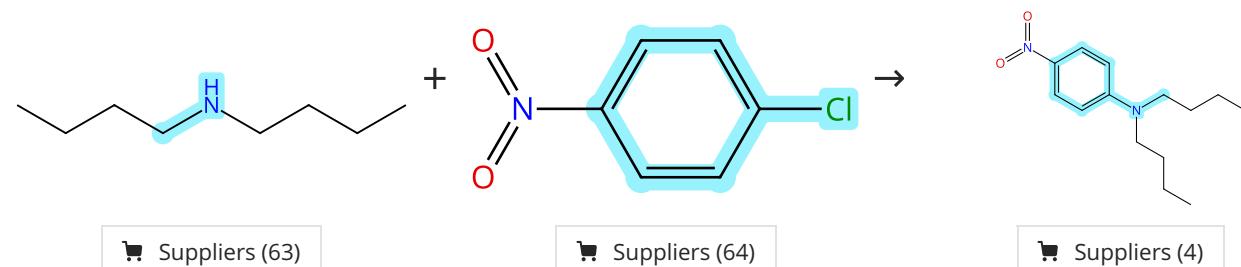
1.1 Catalysts: Palladium diacetate, Water, X-Phos
Solvents: 1,4-Dioxane; rt → 80 °C; 1 min, 80 °C
1.2 Reagents: Sodium *tert*-butoxide
Solvents: 1,4-Dioxane; rt → 110 °C; 1 h, 110 °C

Experimental Protocols

Water-Mediated Catalyst Preactivation: An Efficient Protocol for C-N Cross-Coupling Reactions
 By: Fors, Brett P.; et al

Organic Letters (2008), 10(16), 3505-3508.

Scheme 234 (1 Reaction)



31-172-CAS-672075

Steps: 1 Yield: 97%

1.1 Reagents: Potassium hydroxide

Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tri-tert-butylphosphine*)palladium

Solvents: Toluene, Water

Experimental Protocols

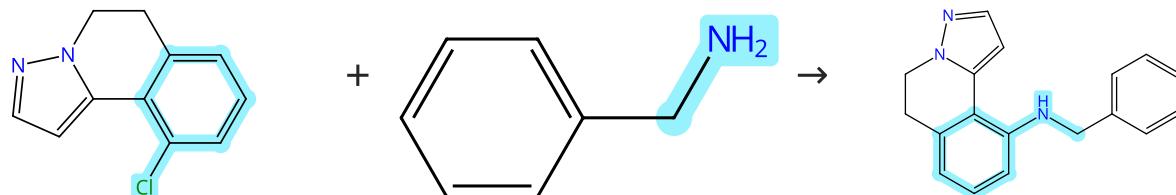
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 235 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (2)

Suppliers (82)

Supplier (1)

31-172-CAS-9173987

Steps: 1 Yield: 97%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Palladium diacetate, 2-(*Di-tert*-butylphosphino)biphenyl

Solvents: Toluene; rt; 5 min, rt; 24 h, 110 °C; 110 °C → rt

Experimental Protocols

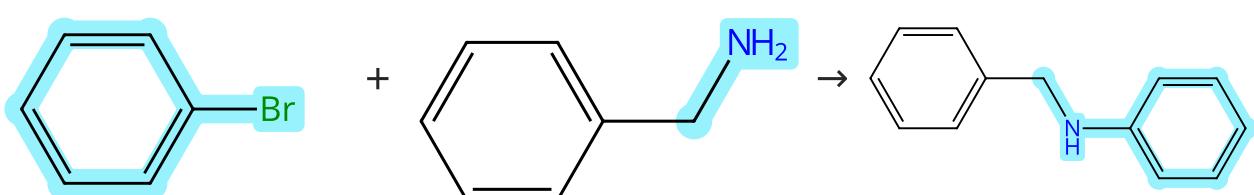
A palladium-catalyzed alkylation/direct arylation synthesis of nitrogen-containing heterocycles

By: Blaszykowski, Christophe; et al

Journal of Organic Chemistry (2008), 73(5), 1888-1897.

Scheme 236 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (74)

Suppliers (82)

Suppliers (88)

31-172-CAS-1952491

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[*(1R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 36 h, 100 °C

Experimental Protocols

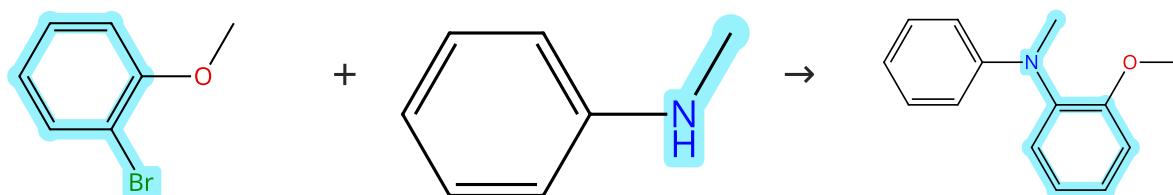
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 237 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (88)

Suppliers (75)

Suppliers (22)

31-172-CAS-2807665

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 50 °C

Experimental Protocols

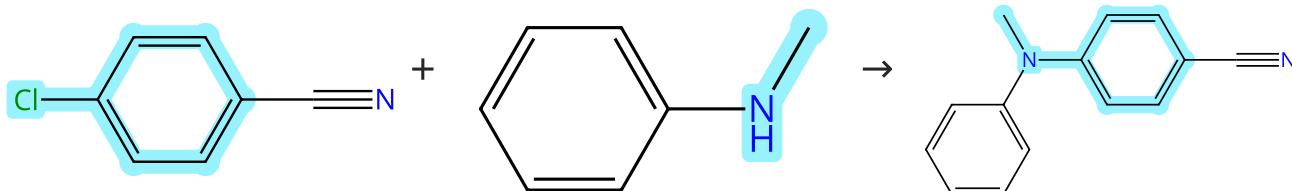
Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Scheme 238 (2 Reactions)

Steps: 1 Yield: 96-97%



Suppliers (102)

Suppliers (75)

Suppliers (5)

31-172-CAS-12402662

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-4,5-dihydro-, tetrafluoroborate(1-) (1:1)

Solvents: 1,2-Dimethoxyethane

Experimental Protocols

High turnover number and rapid, room-temperature amination of chloroarenes using saturated carbene ligands

By: Stauffer, Shaun R.; et al

Organic Letters (2000), 2(10), 1423-1426.

31-172-CAS-11329887

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine

Solvents: Toluene; 5 h, 50 °C

Experimental Protocols

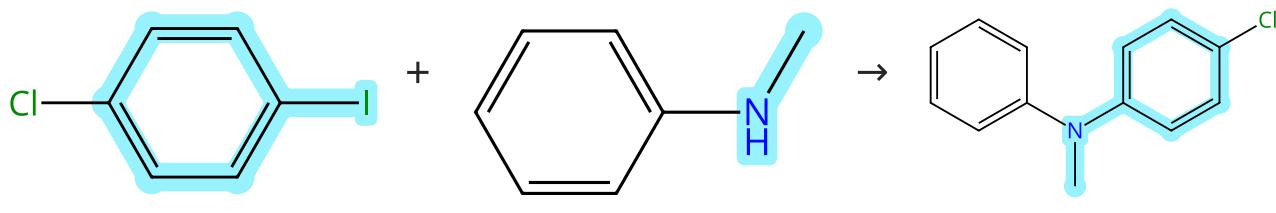
Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2006), 71(14), 5117-5125.

Scheme 239 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (99)

Suppliers (75)

Suppliers (9)

31-172-CAS-3055144

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene

Experimental Protocols

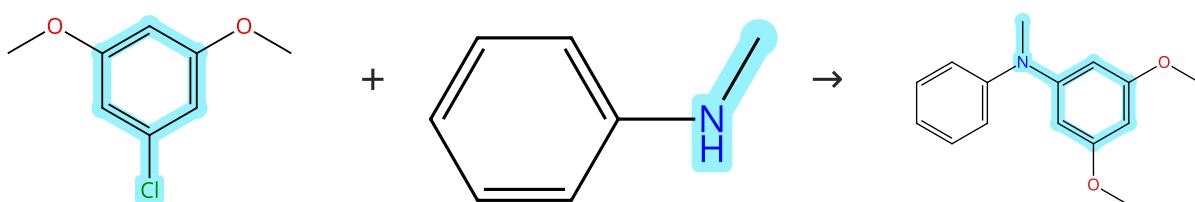
An Improved Method for the Palladium-Catalyzed Amination of Aryl Iodides

By: Ali, Mayssam H.; et al

Journal of Organic Chemistry (2001), 66(8), 2560-2565.

Scheme 240 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (84)

Suppliers (75)

31-172-CAS-5512479

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 2-(Di-*tert*-butylphosphino)biphenyl

Solvents: Toluene

Simple, efficient catalyst system for the palladium-catalyzed amination of aryl chlorides, bromides, and triflates

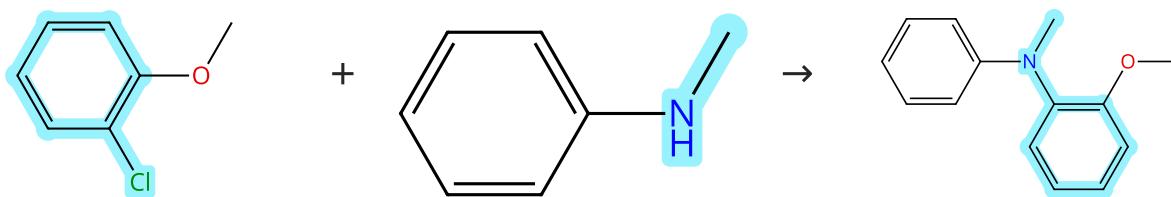
By: Wolfe, John P.; et al

Journal of Organic Chemistry (2000), 65(4), 1158-1174.

Experimental Protocols

Scheme 241 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (66)

Suppliers (75)

Suppliers (22)

31-172-CAS-2472002

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 100 °C

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

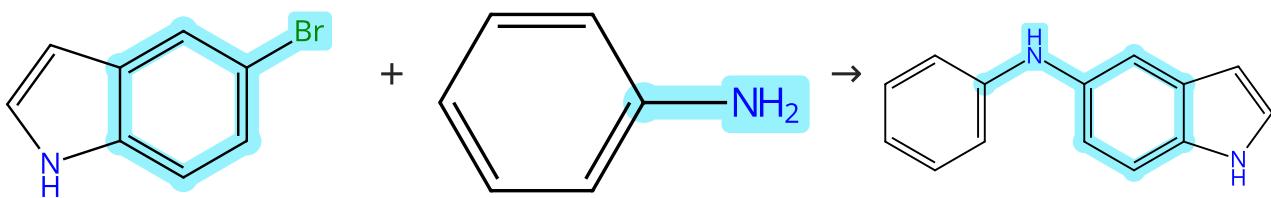
By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Experimental Protocols

Scheme 242 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (121)

Suppliers (100)

Suppliers (8)

31-172-CAS-9335895

Steps: 1 Yield: 97%

Efficient Pd-Catalyzed Amination of Heteroaryl Halides

By: Charles, Mark D.; et al

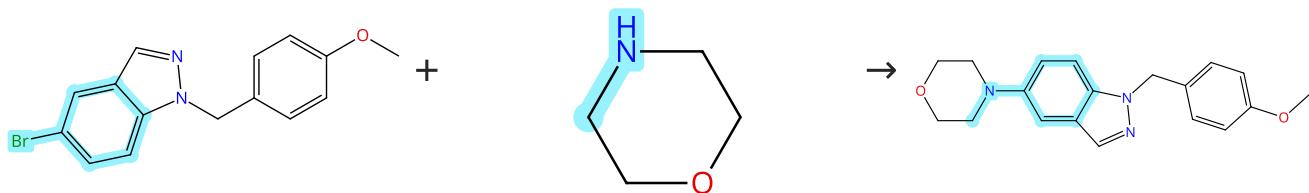
Organic Letters (2005), 7(18), 3965-3968.

1.1 Reagents: Lithium bis(trimethylsilyl)amide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine
Solvents: Tetrahydrofuran; 65 °C; 24 h, 65 °C; 65 °C → rt1.2 Reagents: Hydrochloric acid
Solvents: Water; 5 min, rt1.3 Reagents: Sodium bicarbonate
Solvents: Water; rt

Experimental Protocols

Scheme 243 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (3)

Suppliers (76)

Supplier (1)

31-172-CAS-8176969

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Tetrahydrofuran; overnight, 55 °C

Experimental Protocols

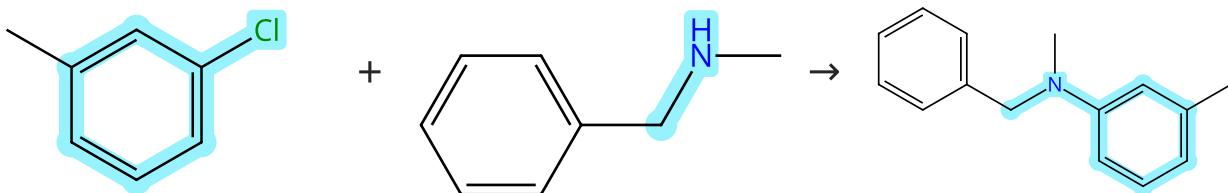
Indazoles: Regioselective Protection and Subsequent Amine Coupling Reactions

By: Slade, David J.; et al

Journal of Organic Chemistry (2009), 74(16), 6331-6334.

Scheme 244 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (68)

Suppliers (85)

Suppliers (9)

31-172-CAS-14816185

Steps: 1 Yield: 97%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

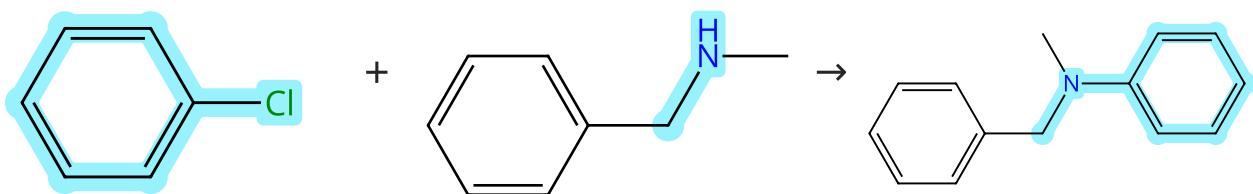
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 245 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (136)

Suppliers (85)

Suppliers (59)

31-172-CAS-12409332

Steps: 1 Yield: 97%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

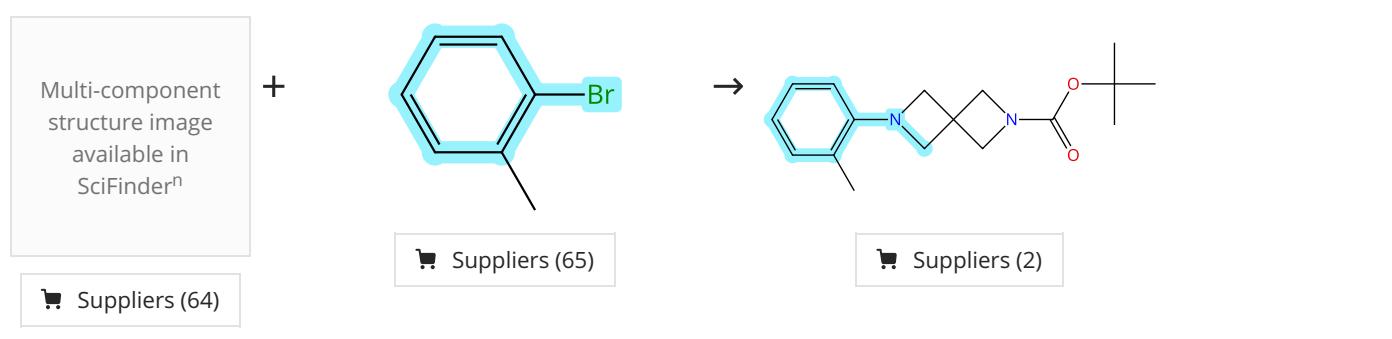
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 246 (1 Reaction)

Steps: 1 Yield: 97%



31-172-CAS-12308296

Steps: 1 Yield: 97%

1.1 Reagents: Triethylamine, Potassium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP; rt → 110 °C; 21 h, 110 °C

Experimental Protocols

2,6-Diazaspiro[3.3]heptanes: Synthesis and Application in Pd-Catalyzed Aryl Amination Reactions

By: Burkhard, Johannes; et al

Organic Letters (2008), 10(16), 3525-3526.

Scheme 247 (2 Reactions)

Steps: 1 Yield: 95-97%



31-172-CAS-6279231

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate, BINAP

Catalysts: Palladium diacetate

Solvents: Toluene; 24 h, 110 °C

Experimental Protocols

Transition metals in organic synthesis, Part 82. First total synthesis of methyl 6-methoxycarbazole-3-carboxylate, glycomaurrol, the anti-TB active micromeline, and the furo[2,3-c]carbazole alkaloid eustifoline-D

By: Forke, Ronny; et al

Synlett (2007), (2), 268-272.

31-172-CAS-11761923

Steps: 1 Yield: 95%

1.1 Reagents: Potassium *tert*-butoxide, Poly(oxy-1,2-ethanediyl), α -[4-[[3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)-2H-1-benzopyran-6-yl]oxy]-1,4-dioxobutyl]- ω -methoxy-Catalysts: Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, Bis(1,1-dimethylethyl)(1-methyl-2,2-diphenylcyclopropyl)phosphine

Solvents: Water; 21 h, rt

Experimental Protocols

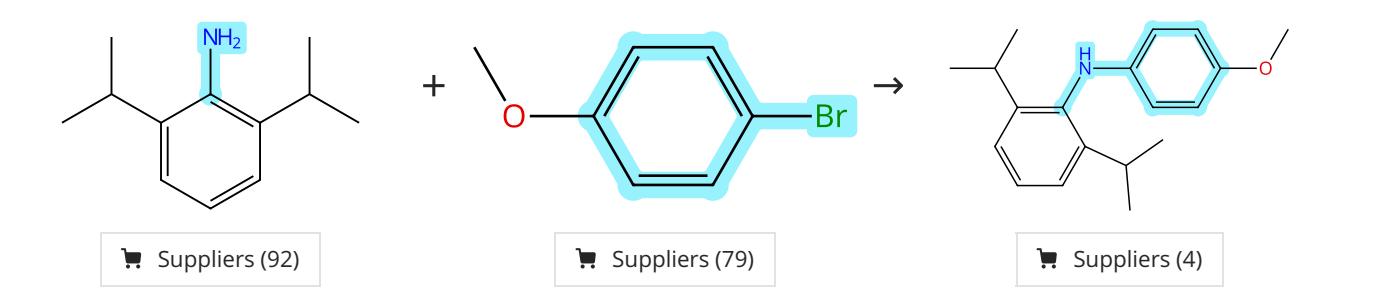
"Nok": A Phytosterol-Based Amphiphile Enabling Transition-Metal-Catalyzed Couplings in Water at Room Temperature

By: Klumphi, Piyatida; et al

Journal of Organic Chemistry (2014), 79(3), 888-900.

Scheme 248 (1 Reaction)

Steps: 1 Yield: 97%



31-172-CAS-3110966

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(η^3 -2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 50 °C

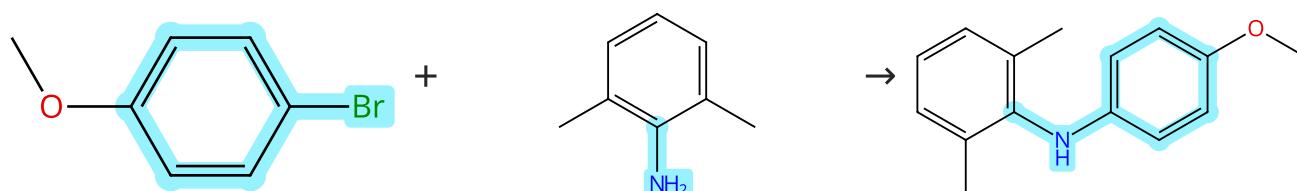
Experimental Protocols

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentyl phosphine (DTBNpP) in the Arylation of Amines and Ketones

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Scheme 249 (1 Reaction)



Suppliers (79)

Suppliers (92)

Suppliers (6)

31-172-CAS-14900693

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

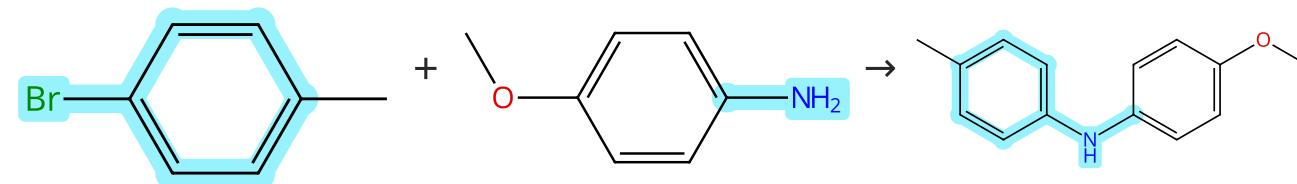
Experimental Protocols

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 250 (1 Reaction)



Suppliers (69)

Suppliers (84)

Suppliers (59)

31-172-CAS-6571156

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2S)-1-[(1*R*)-1-[Bis(1,1-dimethylpropyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 48 h, 100 °C

Experimental Protocols

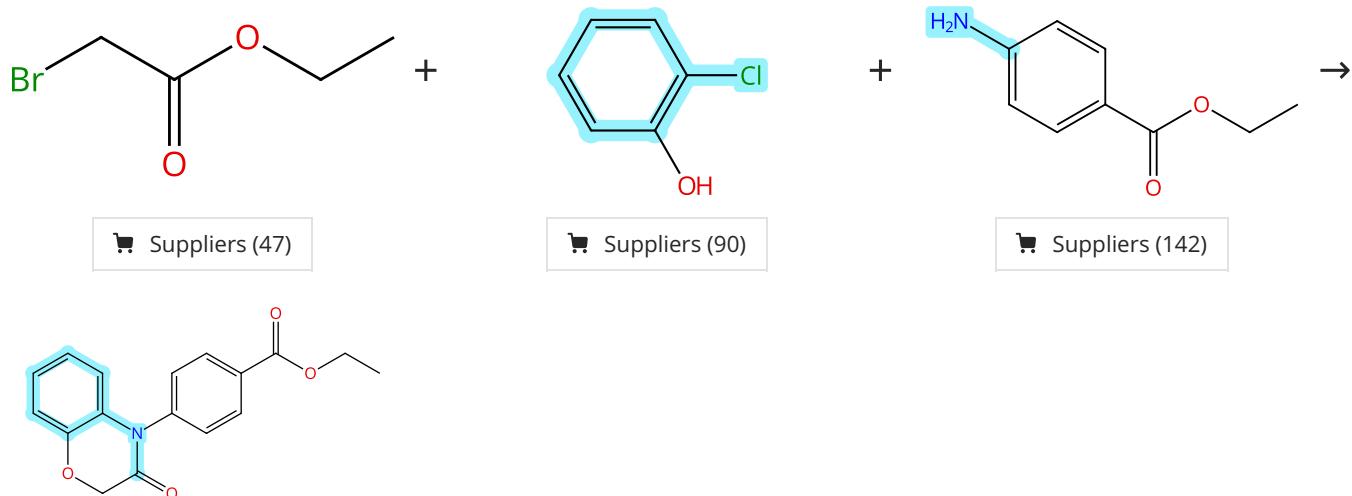
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 251 (1 Reaction)

Steps: 1 Yield: 97%



31-008-CAS-11647147

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, X-Phos
Solvents: Toluene; 3 h, 150 °C

Experimental Protocols

Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2H-1,4-benzoxazines: an improved catalytic system and multicomponent process

By: Feng, Gaofeng; et al

Synthesis (2013), 45(19), 2711-2718.

Scheme 252 (1 Reaction)

Steps: 1 Yield: 97%



31-172-CAS-13526569

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine
Solvents: Toluene; 1 - 6 h, rt

Experimental Protocols

Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides

By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2006), 71(14), 5117-5125.

Scheme 253 (1 Reaction)

Steps: 1 Yield: 97%



31-172-CAS-3149670

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-N,N-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

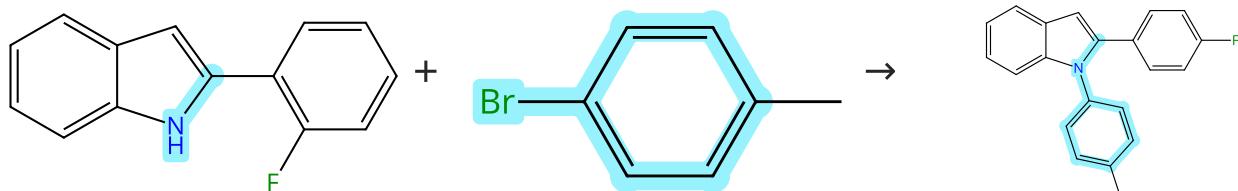
Experimental Protocols

Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 254 (1 Reaction)



Suppliers (36)

Suppliers (69)

Suppliers (2)

31-084-CAS-9893506

Steps: 1 Yield: 97%

1.1 Reagents: Sodium hydroxide

Catalysts: Palladium diacetate, 1*H*-Imidazolium, 1,3-bis(2,4,6-trimethylphenyl)-, chloride (1:1)

Solvents: Toluene

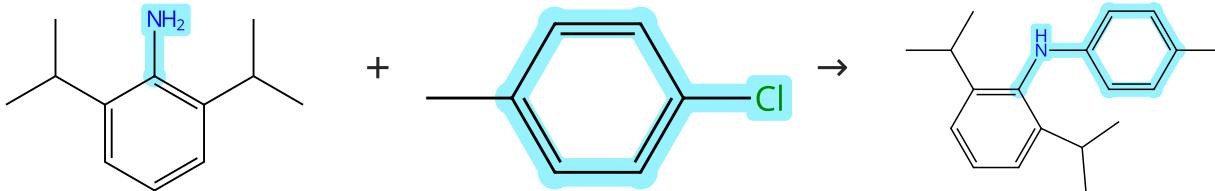
Experimental Protocols

Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Scheme 255 (1 Reaction)



Suppliers (92)

Suppliers (77)

Suppliers (4)

31-172-CAS-5705868

Steps: 1 Yield: 97%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: (*iPr*₂Pd(acac)₂)Cl: An Easily Synthesized, Efficient, and Versatile Precatalyst for C-N and C-C Bond Formation

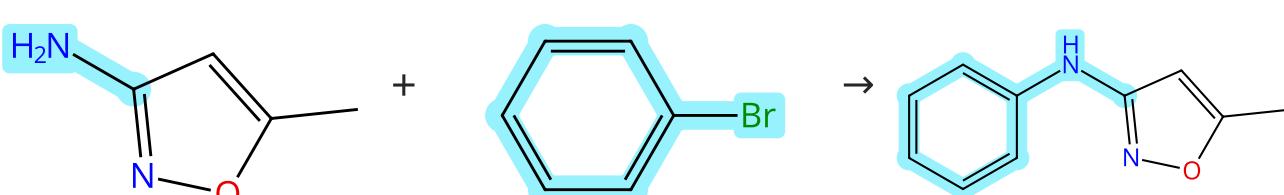
Solvents: 1,2-Dimethoxyethane; 6 h, rt

Experimental Protocols

By: Marion, Nicolas; et al

Journal of Organic Chemistry (2006), 71(10), 3816-3821.

Scheme 256 (1 Reaction)



Suppliers (109)

Suppliers (74)

Suppliers (4)

31-172-CAS-3122768

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(1,1-dimethylethyl)[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine, (*SP*-4-4)-[2-[2-(Amino- κ M)ethyl]phenyl- κ C]chloro[dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine]palladium

Solvents: *tert*-Butanol; 2 h, rt

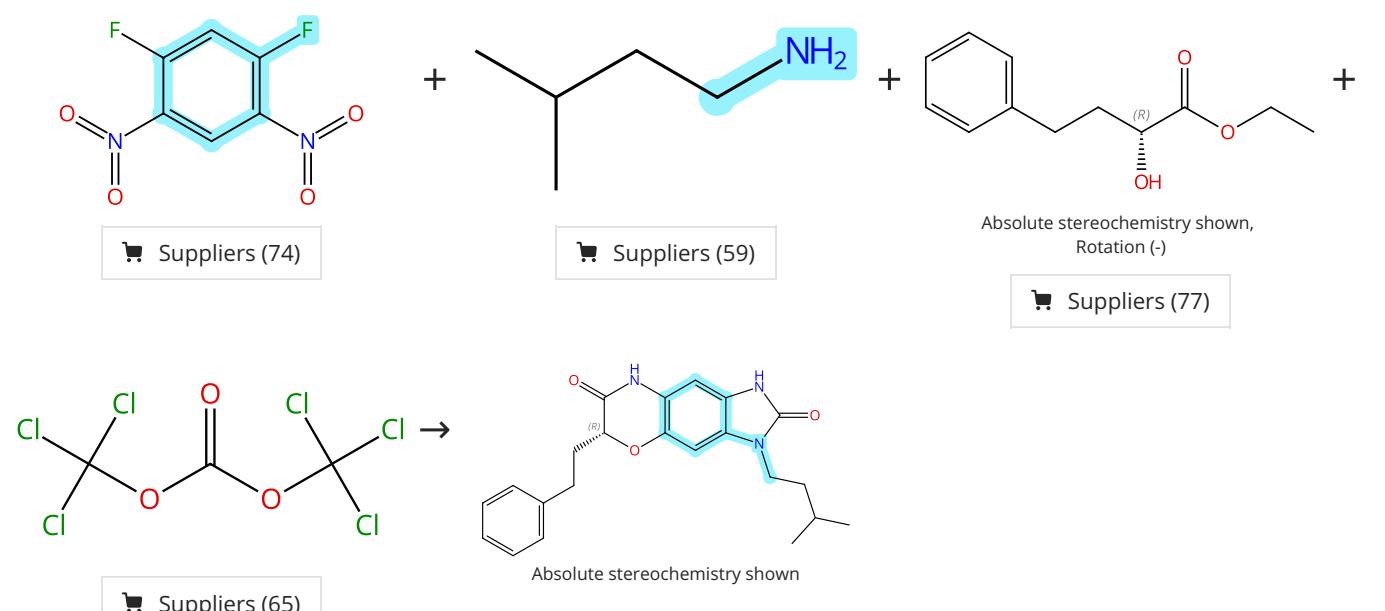
Room-temperature palladium-catalyzed coupling of heteroaryl amines with aryl or heteroaryl bromides

By: Moss, Thomas A.; et al

Synlett (2012), 23(2), 285-289.

Experimental Protocols

Scheme 257 (1 Reaction)



31-170-CAS-1595903

Steps: 1 Yield: 97%

Synthesis of Diverse Benzo[1,4]oxazin-3-one-Based Compounds Using 1,5-Difluoro-2,4-dinitrobenzene

By: Yuan, Yunyun; et al

Journal of Combinatorial Chemistry (2007), 9(1), 158-170.

1.1 Reagents: Diisopropylethylamine

Solvents: Tetrahydrofuran; 1 - 10 h, rt

1.2 Reagents: Potassium carbonate

Solvents: Acetone; rt

1.3 Reagents: Ammonium formate

Catalysts: Palladium

Solvents: Ethanol, Tetrahydrofuran; rt

1.4 Reagents: Diisopropylethylamine

Solvents: Tetrahydrofuran; 5 h, rt

Experimental Protocols

Scheme 258 (1 Reaction)



31-172-CAS-10819104

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Potassium *tert*-butoxide
Catalysts: Palladium
Solvents: Xylene; 7 h, 130 °C

Experimental Protocols

Development of Second Generation Gold-Supported Palladium Material with Low-Leaching and Recyclable Characteristics in Aromatic Amination

By: Al-Amin, Mohammad; et al

Journal of Organic Chemistry (2013), 78(15), 7575-7581.

Scheme 259 (1 Reaction)



Suppliers (2)

Suppliers (74)

Supplier (1)

31-172-CAS-5048396

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; rt; 2 h, 120 °C; 120 °C → rt

Experimental Protocols

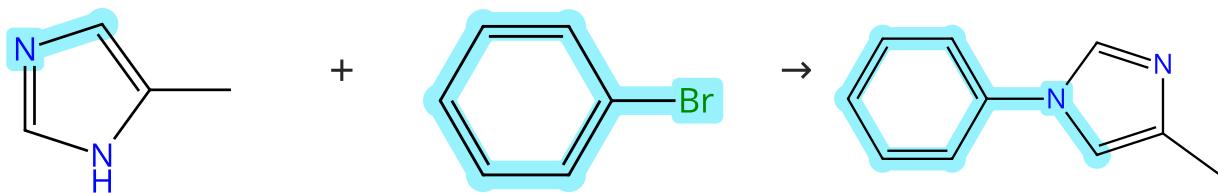
Palladium-catalyzed N-arylation of bis(ortho-substituted aryl) amines: an efficient method for preparing sterically congested triarylamines

By: Kuwano, Ryoichi; et al

Synlett (2010), (12), 1819-1824.

Scheme 260 (2 Reactions)

Steps: 1 Yield: 96-97%



Suppliers (106)

Suppliers (74)

Supplier (5)

31-172-CAS-44716

Steps: 1 Yield: 97%

- 1.1 **Catalysts:** Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl) phosphine
Solvents: Toluene, 1,4-Dioxane; 3 min, 120 °C

- 1.2 **Reagents:** Tripotassium phosphate; 5 h, 120 °C

Experimental Protocols

Completely N¹-selective palladium-catalyzed arylation of unsymmetric imidazoles: application to the synthesis of nilotinib

By: Ueda, Satoshi; et al

Journal of the American Chemical Society (2012), 134(1), 700-706.

31-172-CAS-7504522

Steps: 1 Yield: 96%

- 1.1 **Catalysts:** Tris(dibenzylideneacetone)dipalladium, Bis(1,1-dimethylethyl)[4-methoxy-3,5,6-trimethyl-2',4',6'-tris(1-methyl ethyl)[1,1'-biphenyl]-2-yl]phosphine, Bis(1,1-dimethylethyl)[5-methoxy-3,4,6-trimethyl-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine

Solvents: Toluene, 1,4-Dioxane; 3 min, 120 °C

- 1.2 **Reagents:** Tripotassium phosphate; 5 h, 120 °C

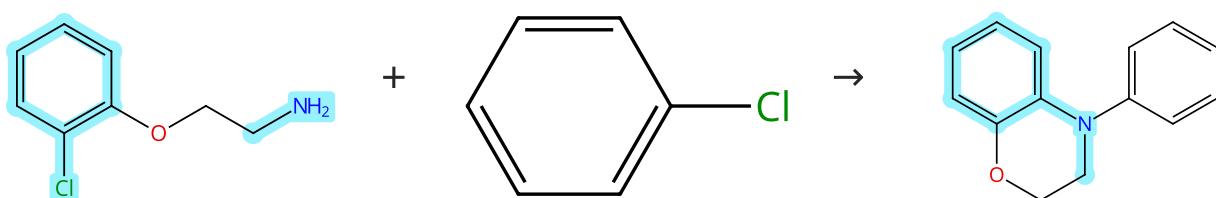
Experimental Protocols

Me₃(OMe)tBuXPhos: A Surrogate Ligand for Me₄tBuXPhos in Palladium-Catalyzed C-N and C-O Bond-Forming Reactions

By: Ueda, Satoshi; et al

Journal of Organic Chemistry (2012), 77(5), 2543-2547.

Scheme 261 (1 Reaction)



Suppliers (66)

Suppliers (136)

Suppliers (3)

31-172-CAS-10131206

Steps: 1 Yield: 97%

- 1.1 **Reagents:** *tert*-Butanol, Sodium hydride
Catalysts: Palladium diacetate, 1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene
Solvents: 1,4-Dioxane; 15 min, 100 °C
- 1.2 **Solvents:** 1,4-Dioxane; 4 h, 100 °C
- 1.3 **Solvents:** 1,4-Dioxane; 6 h, 100 °C; 100 °C → rt

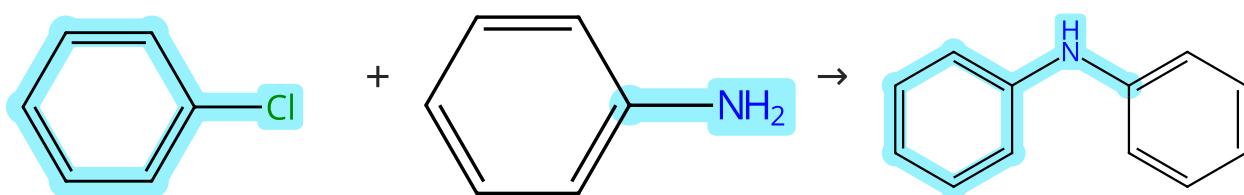
Novel synthetic strategy of N-arylated heterocycles via sequential palladium-catalyzed intra- and inter-arylation reactions

By: Omar-Amrani, Rafik; et al

Synthesis (2004), (15), 2527-2534.

Experimental Protocols

Scheme 262 (1 Reaction)



Suppliers (136)

Suppliers (100)

Suppliers (108)

31-172-CAS-8802968

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Potassium carbonate
Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium
Solvents: 1,4-Dioxane; 1 h, 90 °C

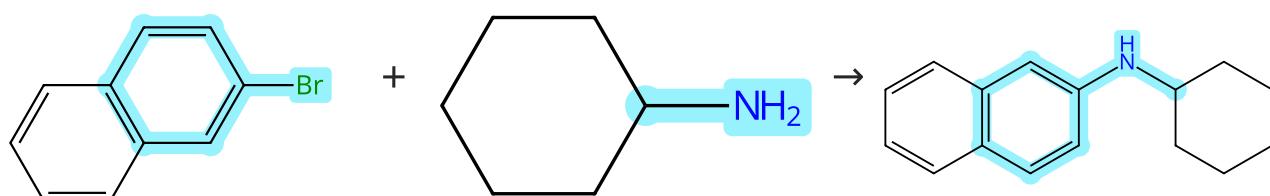
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

Scheme 263 (1 Reaction)



Suppliers (101)

Suppliers (79)

Suppliers (10)

31-172-CAS-6161836

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Bis(*tri-tert*-butylphosphine)palladium
Solvents: Toluene; rt; 3 h, reflux
- 1.2 **Solvents:** Water; rt

Aerobic Oxidative Homocoupling of Aryl Amines Using Heterogeneous Rhodium Catalysts

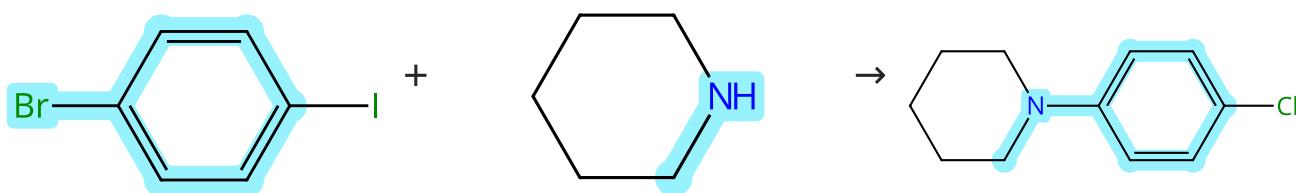
By: Matsumoto, Kenji; et al

Organic Letters (2014), 16(18), 4754-4757.

Experimental Protocols

Scheme 264 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (107)

Suppliers (51)

Suppliers (5)

31-172-CAS-15102181

Steps: 1 Yield: 97%

1.1 Reagents:

Potassium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)
Solvents: 1,4-Dioxane

Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

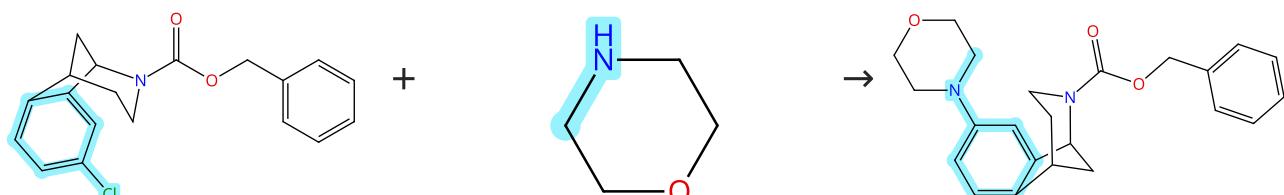
By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Experimental Protocols

Scheme 265 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (2)

Suppliers (76)

Suppliers (3)

31-172-CAS-12594892

Steps: 1 Yield: 97%

Expedient Synthesis of Norbenzomorphan Library via Multicomponent Assembly Process Coupled with Ring-Closing Reactions

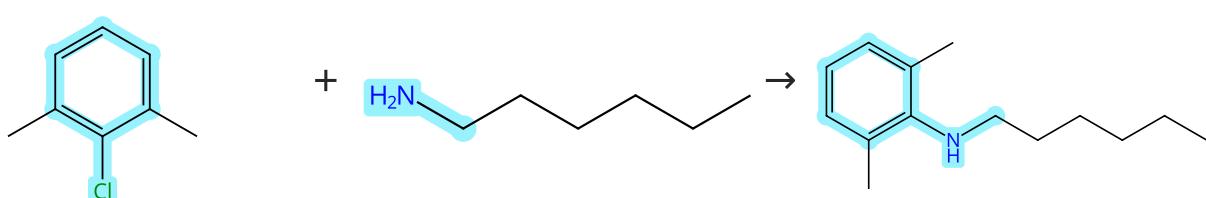
By: Sahn, James J.; et al

ACS Combinatorial Science (2012), 14(9), 496-502.

Experimental Protocols

Scheme 266 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (86)

Suppliers (69)

Suppliers (6)

31-172-CAS-3648392

Steps: 1 Yield: 97%

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

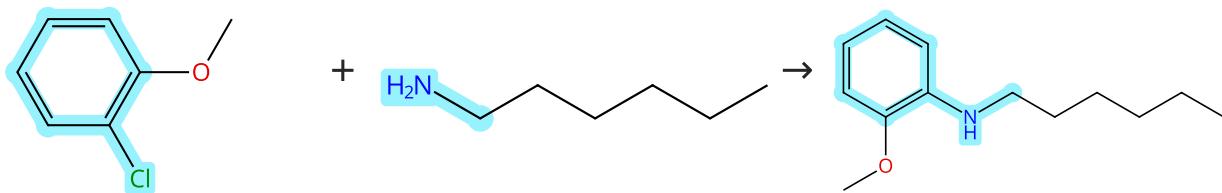
By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Experimental Protocols

Scheme 267 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (66)

Suppliers (69)

Suppliers (12)

31-172-CAS-5794846

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

Experimental Protocols

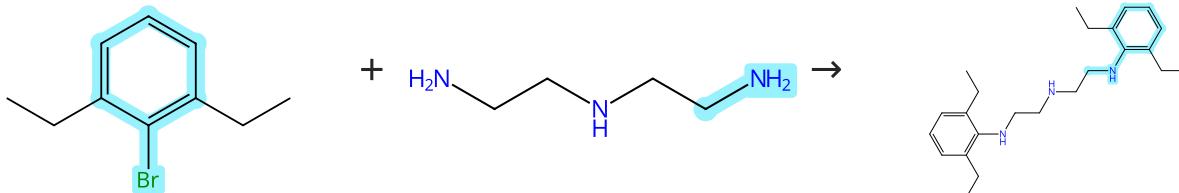
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 268 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (57)

Suppliers (70)

31-172-CAS-4374049

Steps: 1 Yield: 97%

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

1.2 Reagents: Sodium *tert*-butoxide

Experimental Protocols

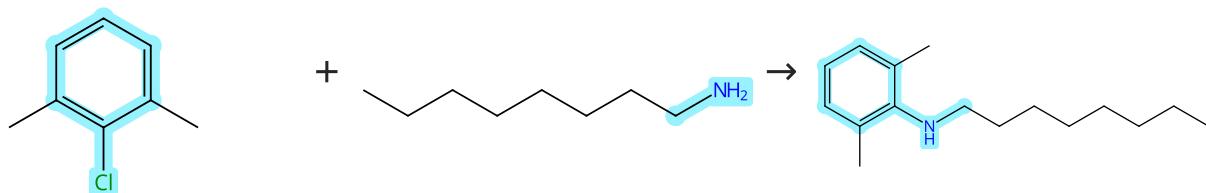
New Yttrium Complexes Bearing Diamidooamine Ligands as Efficient and Diastereoselective Catalysts for the Intramolecular Hydroamination of Alkenes and Alkynes

By: Hultzsch, Kai C.; et al

Organometallics (2004), 23(11), 2601-2612.

Scheme 269 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (86)

Suppliers (77)

Suppliers (7)

31-172-CAS-1290347

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

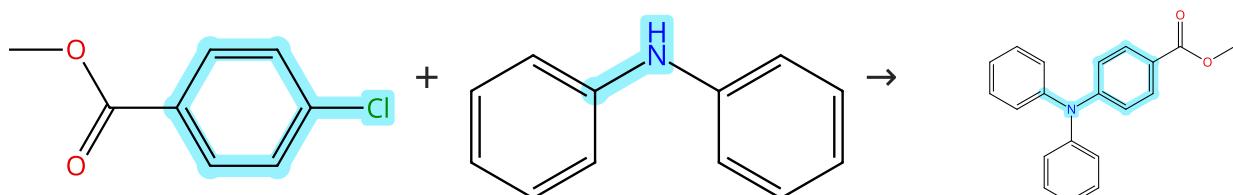
Solvents: 1,2-Dimethoxyethane; 36 h, 100 °C

Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 270 (1 Reaction)

Suppliers (99)

Suppliers (108)

Suppliers (10)

31-172-CAS-12854543

Steps: 1 Yield: 97%

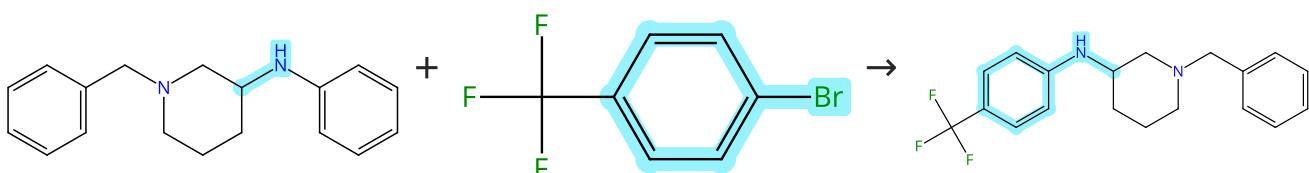
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

1.1 Reagents: Potassium hydroxide
Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tert*-butylphosphine)palladium
Solvents: Toluene, Water

Experimental Protocols

Scheme 271 (1 Reaction)

Suppliers (11)

Suppliers (90)

Suppliers (3)

31-172-CAS-10962375

Steps: 1 Yield: 97%

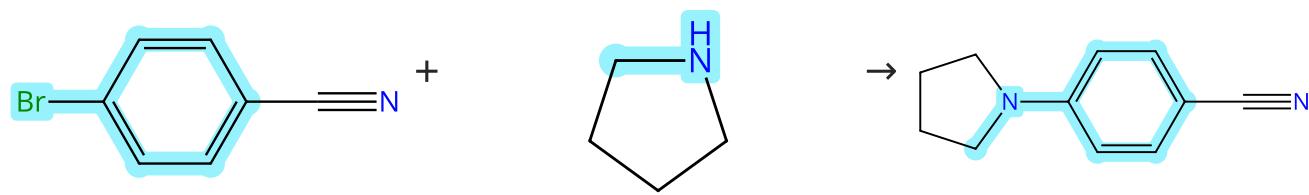
Palladium-Mediated Arylation of 3-Aminopiperidines and 3-Aminopyrrolidines

By: Jean, Ludovic; et al

Journal of Organic Chemistry (2004), 69(25), 8893-8902.

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; 24 h, 100 °C

Experimental Protocols

Scheme 272 (1 Reaction)

Suppliers (105)

Suppliers (79)

Suppliers (79)

31-172-CAS-7004313

Steps: 1 Yield: 97%

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

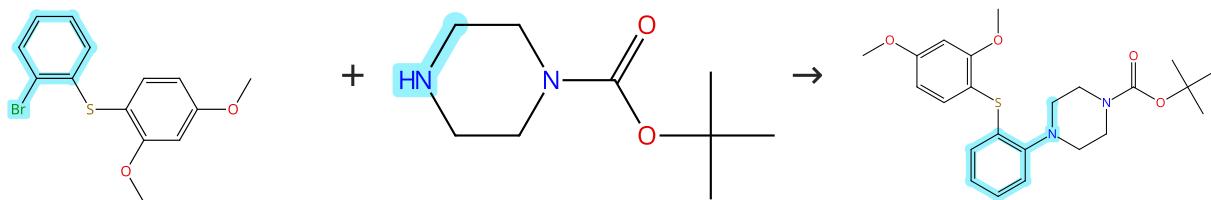
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Experimental Protocols

Scheme 273 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (2)

Suppliers (130)

Suppliers (2)

31-172-CAS-2044637

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; overnight, 100 °C

Experimental Protocols

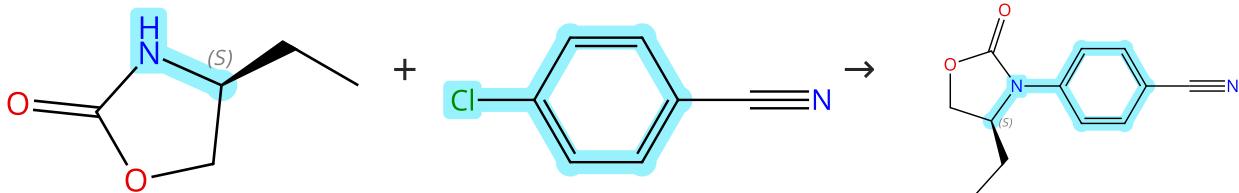
Discovery of 1-[2-(2,4-Dimethylphenylsulfanyl)phenyl]piperazine (Lu AA21004): A Novel Multimodal Compound for the Treatment of Major Depressive Disorder

By: Bang-Andersen, Benny; et al

Journal of Medicinal Chemistry (2011), 54(9), 3206-3221.

Scheme 274 (1 Reaction)

Steps: 1 Yield: 97%

Absolute stereochemistry shown,
Rotation (-)

Suppliers (40)

Suppliers (102)

Absolute stereochemistry shown

Suppliers (8)

31-172-CAS-109939

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl

Solvents: Toluene; 16 h, 100 °C

Experimental Protocols

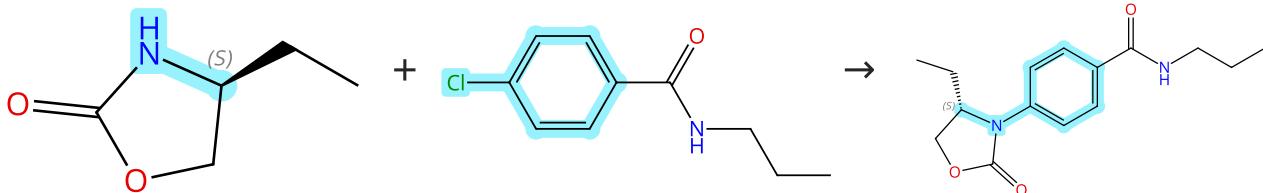
Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Scheme 275 (1 Reaction)

Steps: 1 Yield: 97%

Absolute stereochemistry shown,
Rotation (-)

Suppliers (40)

Suppliers (24)

Absolute stereochemistry shown

Suppliers (7)

31-172-CAS-6164555

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl

Solvents: Toluene; 18 h, 115 °C

Experimental Protocols

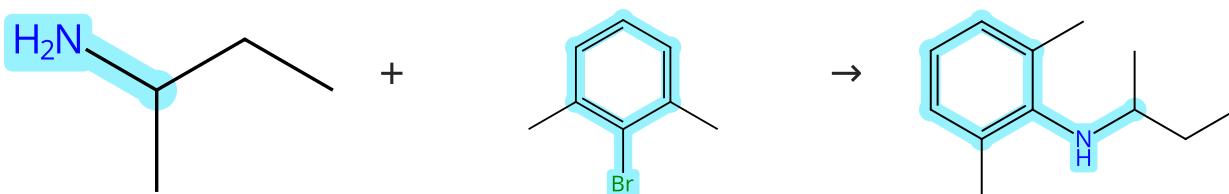
Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Scheme 276 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (69)

Suppliers (97)

Suppliers (6)

31-172-CAS-5554759

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene
Solvents: 1,2-Dimethoxyethane; 24 h, 100 °C

Experimental Protocols

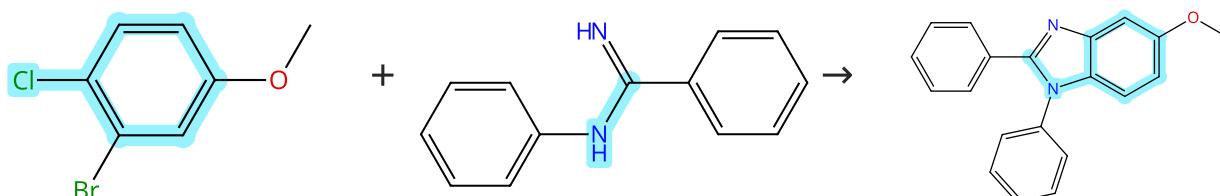
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 277 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (91)

Suppliers (58)

Supplier (1)

31-172-CAS-11640611

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Bis(dibenzylideneacetone)palladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Solvents: Toluene; 10 min, rt; 24 h, 140 °C

Experimental Protocols

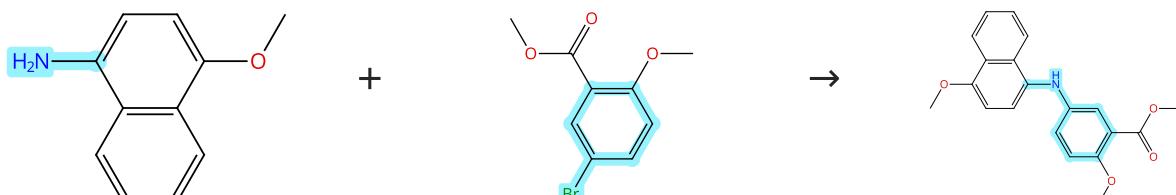
Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Scheme 278 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (38)

Suppliers (73)

Suppliers (2)

31-172-CAS-12938272

Steps: 1 Yield: 97%

- 1.1 **Catalysts:** Palladium diacetate, BINAP
Solvents: Toluene; 30 s, rt; 1 min, rt
1.2 **Reagents:** Cesium carbonate
Solvents: Toluene; rt → 120 °C; 24 h, 120 °C

Experimental Protocols

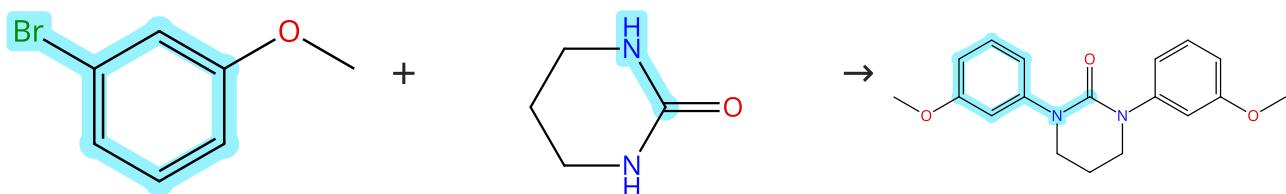
Design, synthesis, and structure-activity relationship of N-arylnaphthylamine derivatives as amyloid aggregation inhibitors

By: Di Santo, Roberto; et al

Journal of Medicinal Chemistry (2012), 55(19), 8538-8548.

Scheme 279 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (91)

Suppliers (63)

Suppliers (3)

31-172-CAS-12444628

Steps: 1 Yield: 97%

1.1 Reagents: Urea, Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
Catalysts: Tris(dibenzylideneacetone)dipalladium
Solvents: 1,4-Dioxane

Experimental Protocols

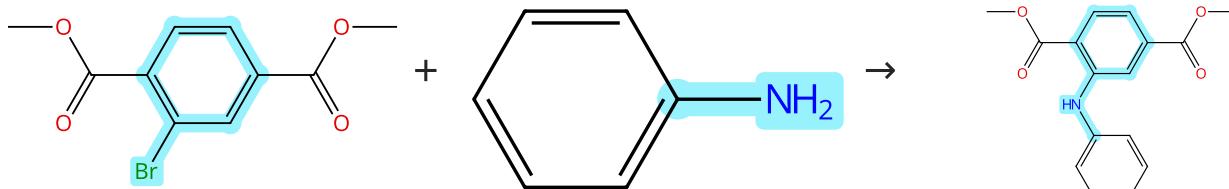
Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

Scheme 280 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (74)

Suppliers (100)

Suppliers (13)

31-172-CAS-3978872

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, (-)-BINAP
Solvents: Toluene; rt → 100 °C; 24 h, 100 °C

Experimental Protocols

Acridone-Based Inhibitors of Inosine 5'-Monophosphate Dehydrogenase: Discovery and SAR Leading to the Identification of N-(2-(6-(4-Ethylpiperazin-1-yl)pyridin-3-yl)propan-2-yl)-2-fluoro-9-oxo-9,10-dihydroacridine-3-carboxamide (BMS-566419)

By: Watterson, Scott H.; et al

Journal of Medicinal Chemistry (2007), 50(15), 3730-3742.

Scheme 281 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (93)

Suppliers (81)

Suppliers (7)

31-172-CAS-2891804

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine
Solvents: 1,4-Dioxane; 24 h, 110 °C; 110 °C → rt

1.2 Reagents: Water; rt

Experimental Protocols

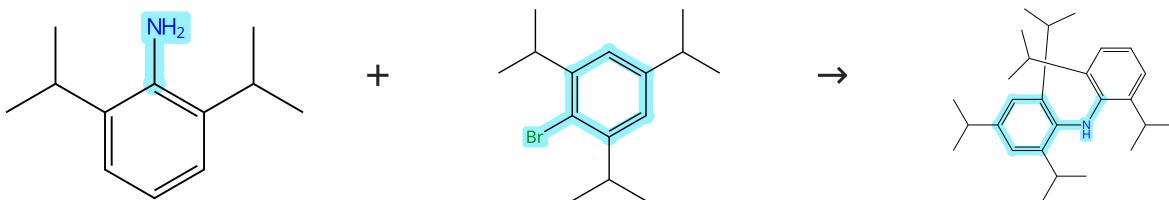
Synthesis of Heterocycles via Pd-Ligand Controlled Cyclization of 2-Chloro-N-(2-vinyl)aniline: Preparation of Carbazoles, Indoles, Dibenzazepines, and Acridines

By: Tsvelikhovsky, Dmitry; et al

Journal of the American Chemical Society (2010), 132(40), 14048-14051.

Scheme 282 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (92)

Suppliers (102)

Suppliers (3)

31-172-CAS-9563209

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, Tris(2,2-dimethylpropyl)phosphine; rt

1.2 Solvents: Toluene; 3 h, 80 °C

Experimental Protocols

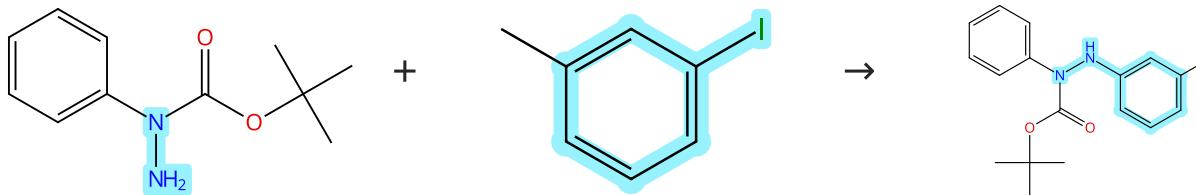
Trineopentylphosphine: a conformationally flexible ligand for the coupling of sterically demanding substrates in the Buchwald-Hartwig amination and Suzuki-Miyaura reaction

By: Raders, Steven M.; et al

Journal of Organic Chemistry (2013), 78(10), 4649-4664.

Scheme 283 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (18)

Suppliers (82)

31-172-CAS-12491684

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine

Solvents: Toluene; 2 h, 110 °C

Experimental Protocols

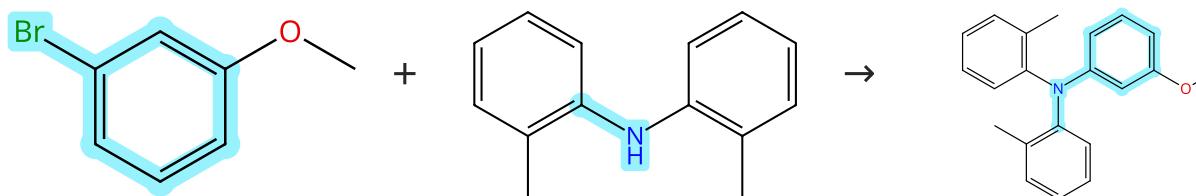
Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Scheme 284 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (91)

Suppliers (49)

Suppliers (2)

31-172-CAS-14197600

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, Tri-*tert*-butylphosphine

Solvents: Toluene; rt; 2 h, 120 °C; 120 °C → rt

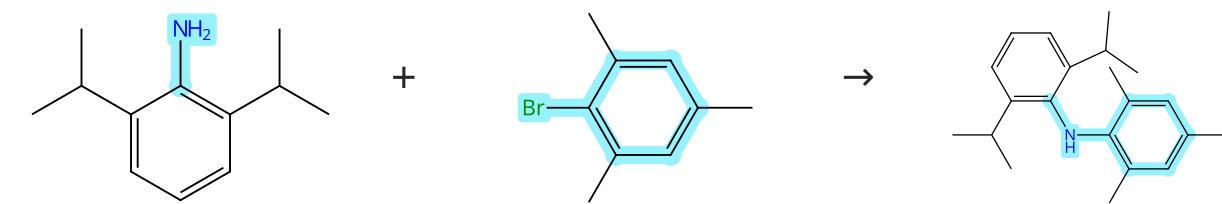
Experimental Protocols

Palladium-catalyzed N-arylation of bis(ortho-substituted aryl) amines: an efficient method for preparing sterically congested triarylamines

By: Kuwano, Ryoichi; et al

Synlett (2010), (12), 1819-1824.

Scheme 285 (1 Reaction)



Suppliers (92)

Suppliers (93)

Suppliers (3)

31-172-CAS-10173385

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, Tris(2,2-dimethylpropyl)phosphine; rt

1.2 Solvents: Toluene; 20 min, 80 °C

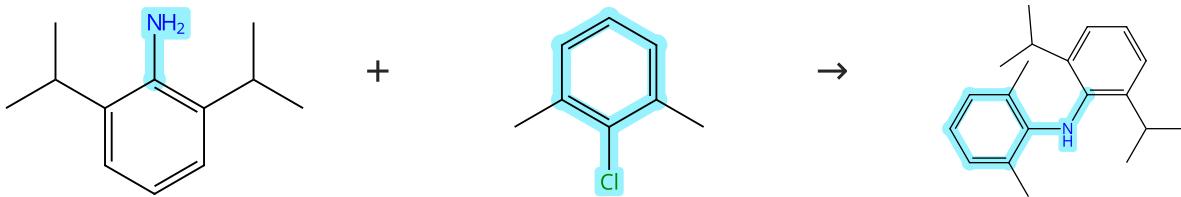
Experimental Protocols

Trineopentylphosphine: a conformationally flexible ligand for the coupling of sterically demanding substrates in the Buchwald-Hartwig amination and Suzuki-Miyaura reaction

By: Raders, Steven M.; et al

Journal of Organic Chemistry (2013), 78(10), 4649-4664.

Scheme 286 (1 Reaction)



Suppliers (92)

Suppliers (86)

Suppliers (6)

31-172-CAS-721453

Steps: 1 Yield: 97%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 90 min, rt

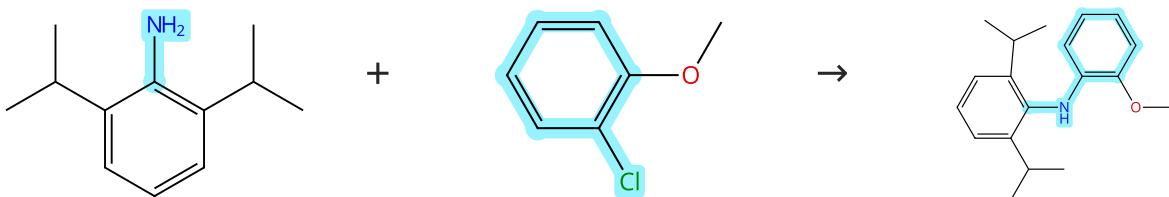
Experimental Protocols

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 287 (1 Reaction)



Suppliers (92)

Suppliers (66)

Supplier (1)

31-172-CAS-8117342

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, Tris(2,2-dimethylpropyl)phosphine; rt

1.2 Solvents: Toluene; 13 h, 100 °C

Experimental Protocols

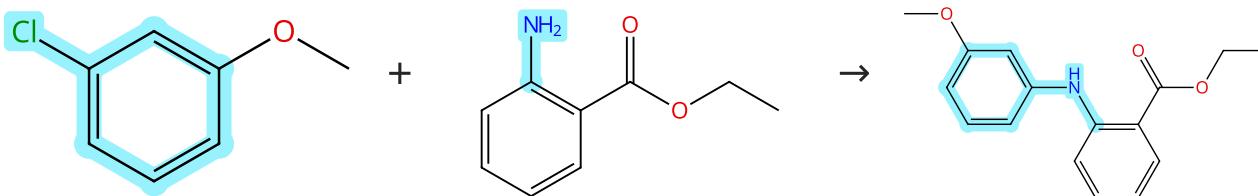
Trineopentylphosphine: a conformationally flexible ligand for the coupling of sterically demanding substrates in the Buchwald-Hartwig amination and Suzuki-Miyaura reaction

By: Raders, Steven M.; et al

Journal of Organic Chemistry (2013), 78(10), 4649-4664.

Scheme 288 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (82)

Suppliers (68)

Suppliers (5)

31-172-CAS-7491770

Steps: 1 Yield: 97%

1.1 Reagents: Potassium carbonate
 Catalysts: (*i*P-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C]chloro [dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl] phosphine]palladium
 Solvents: *tert*-Butanol; 0.5 h, rt \rightarrow 110 °C

A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

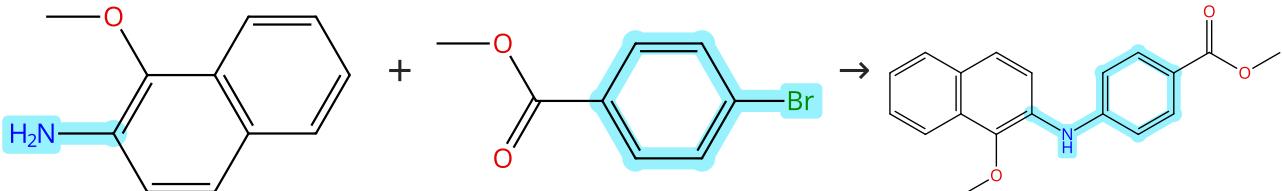
By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

Experimental Protocols

Scheme 289 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (18)

Suppliers (100)

Suppliers (2)

31-172-CAS-12339107

Steps: 1 Yield: 97%

1.1 Catalysts: Palladium diacetate, BINAP
 Solvents: Toluene; 30 s, rt; 1 min, rt
 1.2 Reagents: Cesium carbonate
 Solvents: Toluene; rt \rightarrow 80 °C; 4 h, 80 °C

Design, synthesis, and structure-activity relationship of N-aryl naphthylamine derivatives as amyloid aggregation inhibitors

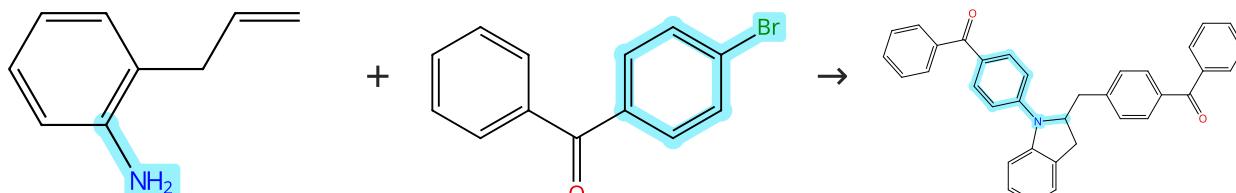
By: Di Santo, Roberto; et al

Journal of Medicinal Chemistry (2012), 55(19), 8538-8548.

Experimental Protocols

Scheme 290 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (16)

Suppliers (86)

Suppliers (2)

31-172-CAS-1487603

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide
 Catalysts: Tris(dibenzylideneacetone)dipalladium, Bis[2-(diphenylphosphino)phenyl] ether
 Solvents: Toluene; 105 °C; 105 °C \rightarrow rt
 1.2 Reagents: Ammonium chloride
 Solvents: Water; rt

Palladium-catalyzed synthesis of N-aryl-2-benzylindolines via tandem arylation of 2-allylaniline: Control of selectivity through *in situ* catalyst modification

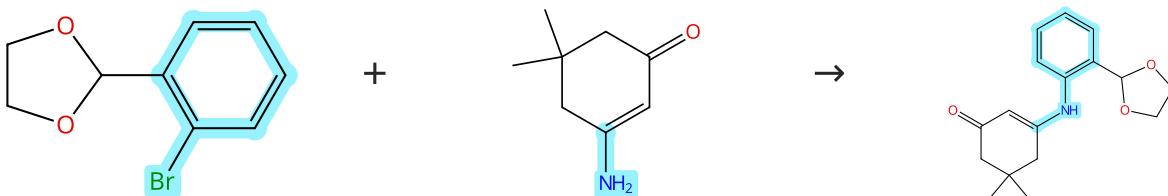
By: Lira, Ricardo; et al

Journal of the American Chemical Society (2004), 126(43), 13906-13907.

Experimental Protocols

Scheme 291 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (94)

Suppliers (67)

Supplier (1)

31-172-CAS-12485642

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-N,N-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

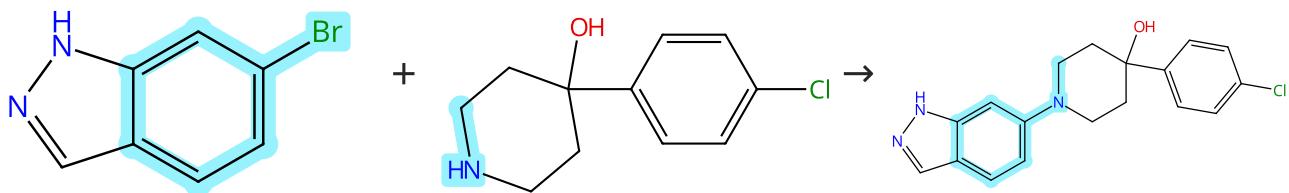
By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Experimental Protocols

Scheme 292 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (93)

Suppliers (122)

Supplier (1)

31-172-CAS-3218369

Steps: 1 Yield: 97%

Efficient Pd-catalyzed amination reactions for heterocycle functionalization

By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

1.1 Reagents: Lithium bis(trimethylsilyl)amide

Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (SP4-4)-[2-[2-(Amino- κ Nethyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium

Solvents: Tetrahydrofuran; 4 h, 65 °C; 65 °C → rt

1.2 Reagents: Hydrochloric acid

Solvents: Water; rt

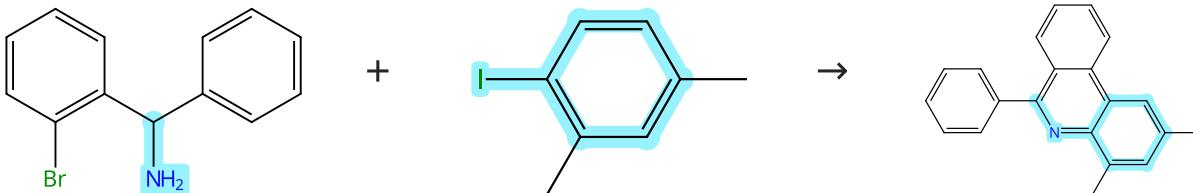
1.3 Reagents: Sodium bicarbonate

Solvents: Ethyl acetate, Water; rt

Experimental Protocols

Scheme 293 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (51)

Suppliers (74)

Supplier (1)

31-172-CAS-9396773

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Norbornene, Triphenylphosphine, Palladium diacetate

Solvents: Dimethylformamide; 24 - 48 h, 130 °C

1.2 Reagents: Oxygen; overnight, 130 °C

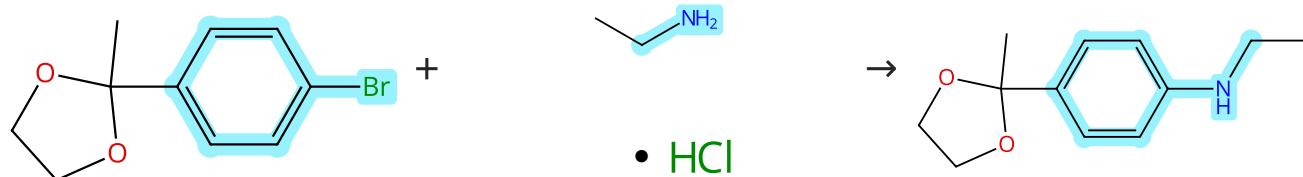
Experimental Protocols

Expedited Synthesis of Phenanthridines from Benzylamines via Dual Palladium Catalysis

By: Maestri, Giovanni; et al

Organic Letters (2010), 12(24), 5692-5695.

Scheme 294 (1 Reaction)



Suppliers (47)

Suppliers (54)

Supplier (1)

31-172-CAS-12559248

Steps: 1 Yield: 97%

1.1 Catalysts: Palladium diacetate, SL-J009-1

Solvents: 1,4-Dioxane; 5 min, rt

1.2 Reagents: Sodium *tert*-butoxide

Solvents: 1,4-Dioxane; 12 h, 80 °C

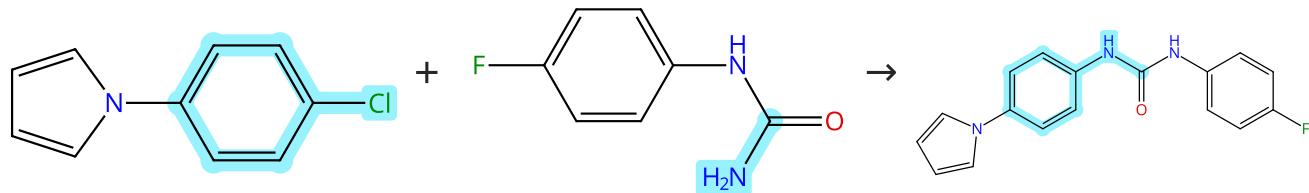
Experimental Protocols

Palladium-Catalyzed Amination of Aryl Chlorides and Bromides with Ammonium Salts

By: Green, Rebecca A.; et al

Organic Letters (2014), 16(17), 4388-4391.

Scheme 295 (1 Reaction)



Suppliers (55)

Suppliers (60)

Supplier (1)

31-172-CAS-9645855

Steps: 1 Yield: 97%

1.1 Catalysts: Palladium diacetate, Water, [3,6-Dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]bis(1,1-dimethylethyl) phosphine

Solvents: Tetrahydrofuran; 4 min, rt → 110 °C

1.2 Reagents: Cesium carbonate; 5 h, rt → 85 °C

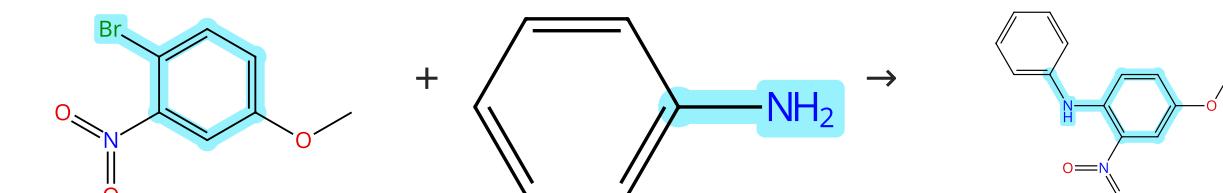
Experimental Protocols

Synthesis of Unsymmetrical Diarylureas via Pd-Catalyzed C-N Cross-Coupling Reactions

By: Breitler, Simon; et al

Organic Letters (2011), 13(12), 3262-3265.

Scheme 296 (1 Reaction)



Suppliers (88)

Suppliers (100)

Suppliers (15)

31-172-CAS-13098546

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate, BINAP

Catalysts: Tris(dibenzylideneacetone)dipalladium

Solvents: Toluene; 24 h, 110 °C; 110 °C → rt

Experimental Protocols

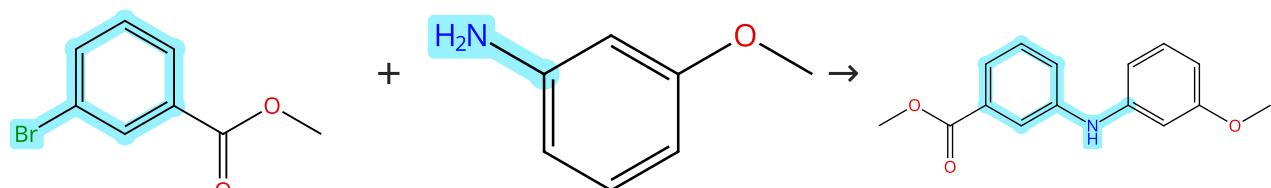
Efficient Methods for the Synthesis of 2-Hydroxyphenazine Based on the Pd-Catalyzed N-Arylation of Aryl Bromides

By: Tietze, Mario; et al

Organic Letters (2005), 7(8), 1549-1552.

Scheme 297 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (100)

Suppliers (76)

Suppliers (2)

31-172-CAS-846622

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 4 - 48 h, 120 °C

Experimental Protocols

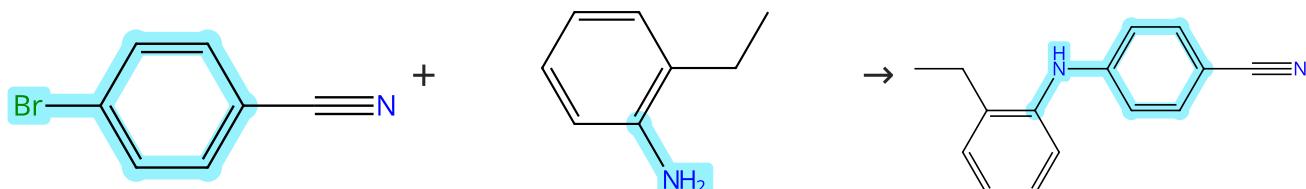
Development of Potent and Selective Inhibitors of Aldo-Keto Reductase 1C3 (Type 5 17 β -Hydroxysteroid Dehydrogenase) Based on N-Phenyl-Aminobenzoates and Their Structure-Activity Relationships

By: Adeniji, Adegoke O.; et al

Journal of Medicinal Chemistry (2012), 55(5), 2311-2323.

Scheme 298 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (105)

Suppliers (74)

Suppliers (6)

31-172-CAS-7417270

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

Experimental Protocols

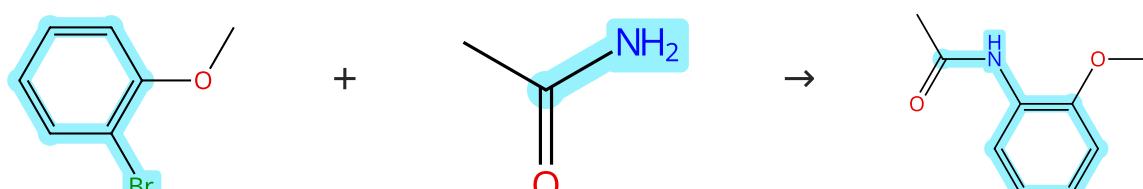
P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 299 (1 Reaction)

Steps: 1 Yield: 97%



Suppliers (88)

Suppliers (97)

Suppliers (59)

31-172-CAS-8516688

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
 Catalysts: Tris(dibenzylideneacetone)dipalladium
 Solvents: 1,4-Dioxane

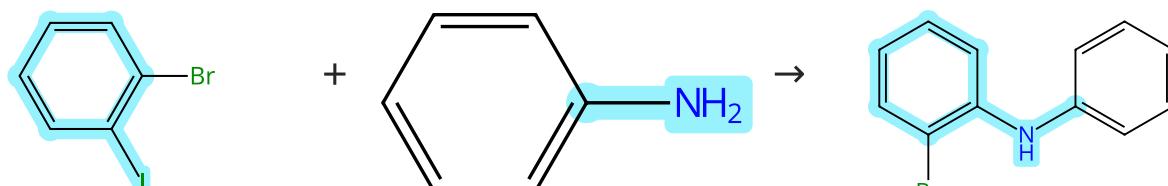
Experimental Protocols

Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

Scheme 300 (1 Reaction)



Suppliers (105)

Suppliers (100)

Suppliers (63)

31-172-CAS-2460381

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide
 Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]
 Solvents: Toluene

1.2 rt; 15 min, 110 °C; 110 °C → rt

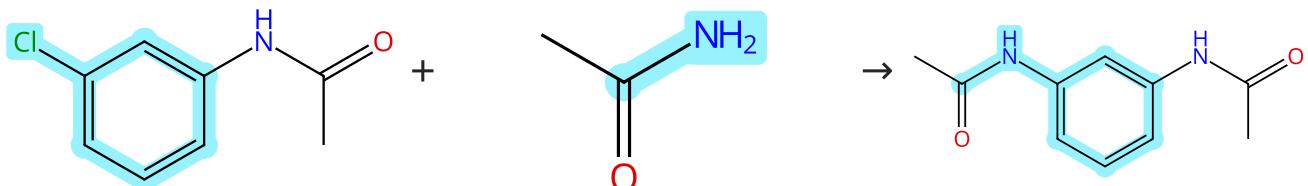
Experimental Protocols

New Phosphine-Functionalized NHC Ligands: Discovery of an Effective Catalyst for the Room-Temperature Amination of Aryl Chlorides with Primary and Secondary Amines

By: Wheaton, Craig A.; et al

Organometallics (2013), 32(21), 6148-6161.

Scheme 301 (1 Reaction)



Suppliers (60)

Suppliers (97)

Suppliers (47)

31-172-CAS-11770063

Steps: 1 Yield: 97%

1.1 Reagents: Tripotassium phosphate
 Catalysts: Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine
 Solvents: *tert*-Butanol; 24 h, 110 °C

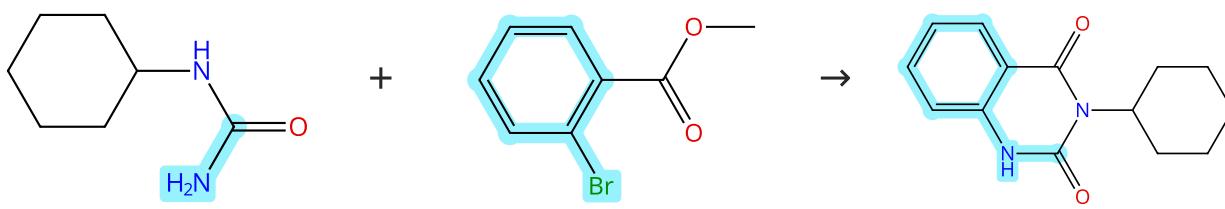
Experimental Protocols

Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation

By: Ikawa, Takashi; et al

Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Scheme 302 (1 Reaction)



Suppliers (70)

Suppliers (90)

Suppliers (14)

31-172-CAS-11171

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; rt → 100 °C; 48 h, 100 °C; 100 °C → rt

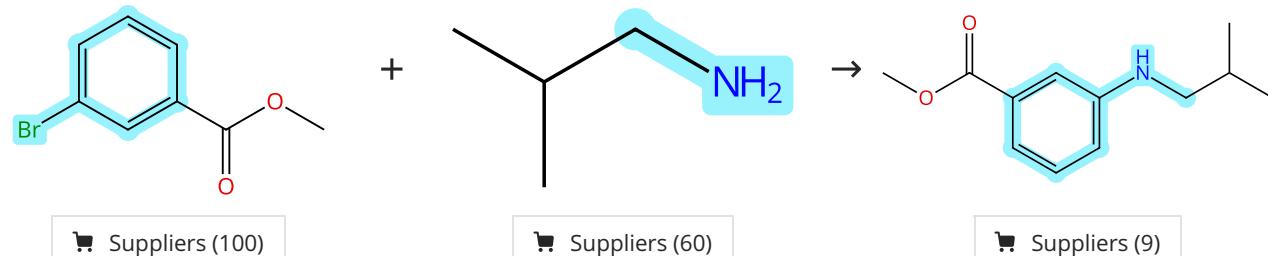
Experimental Protocols

Tandem Palladium-Catalyzed Urea Arylation-Intramolecular Ester Amidation: Regioselective Synthesis of 3-Alkylated 2,4-Quinazolininediones

By: Willis, Michael C.; et al

Organic Letters (2006), 8(22), 5089-5091.

Scheme 303 (1 Reaction)



31-172-CAS-3056050

Steps: 1 Yield: 97%

1.1 Reagents: Tripotassium phosphate

Catalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 24 h, 110 °C

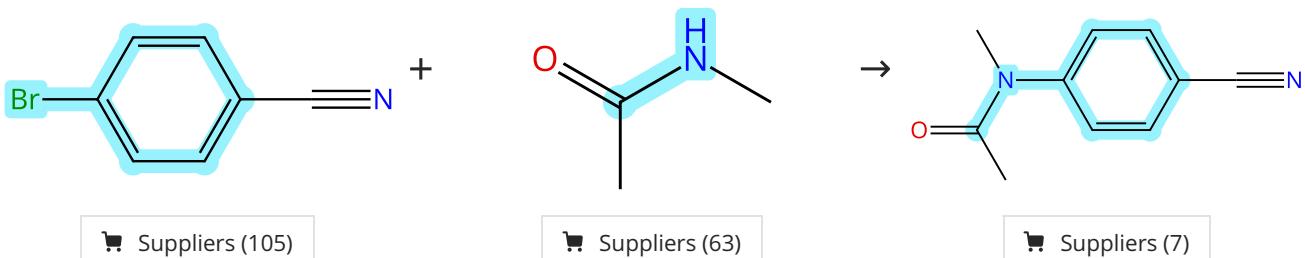
Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 304 (2 Reactions)



31-172-CAS-7042571

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Catalysts: Palladium diacetate

Solvents: 1,4-Dioxane

Experimental Protocols

Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

31-172-CAS-12266292

Steps: 1 Yield: 97%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Tetrahydrofuran

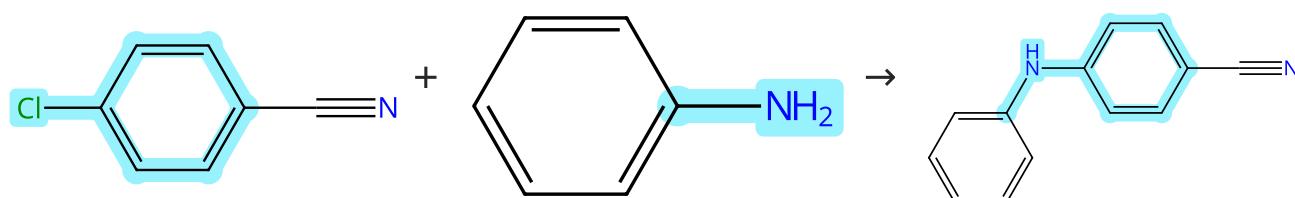
Experimental Protocols

Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Scheme 305 (1 Reaction)



31-172-CAS-4664202

Steps: 1 Yield: 97%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

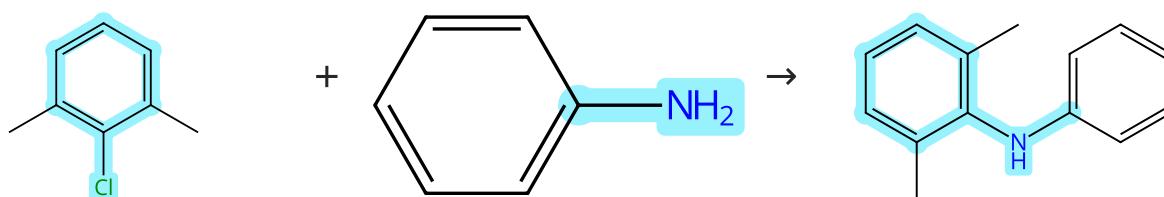
Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 306 (1 Reaction)



31-172-CAS-4375084

Steps: 1 Yield: 97%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κ L³)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

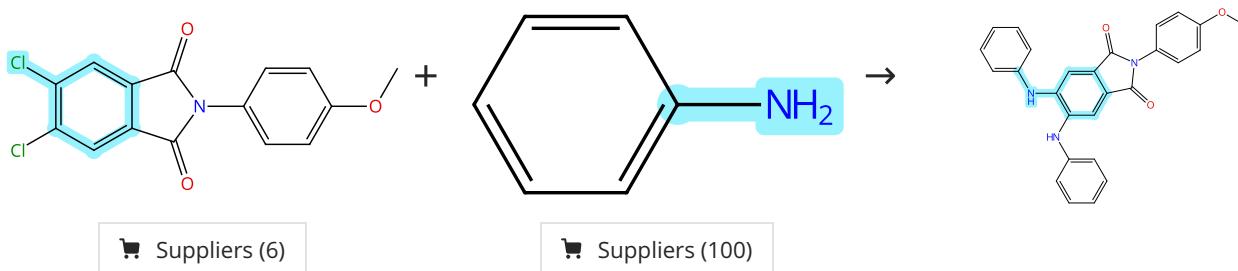
Experimental Protocols

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 307 (1 Reaction)



31-172-CAS-10731059

Steps: 1 Yield: 97%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, X-Phos

Solvents: Toluene; 5 min, rt

1.2 Solvents: Toluene; 21 h, 110 °C

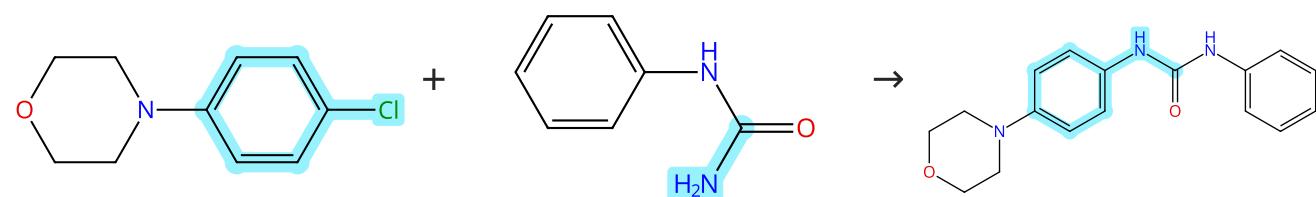
Experimental Protocols

Synthesis of 4,5-Dianilinophthalimide and Related Analogs for Potential Treatment of Alzheimer's Disease via Palladium-Catalyzed Amination

By: Hennessy, Edward J.; et al

Journal of Organic Chemistry (2005), 70(18), 7371-7375.

Scheme 308 (1 Reaction)

[Suppliers \(58\)](#)[Suppliers \(85\)](#)[Suppliers \(3\)](#)

31-172-CAS-9972264

Steps: 1 Yield: 97%

- 1.1 **Catalysts:** Palladium diacetate, Water, [3,6-Dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]bis(1,1-dimethylethyl) phosphine
Solvents: Tetrahydrofuran; 4 min, rt → 110 °C
- 1.2 **Reagents:** Cesium carbonate; 7 h, rt → 85 °C

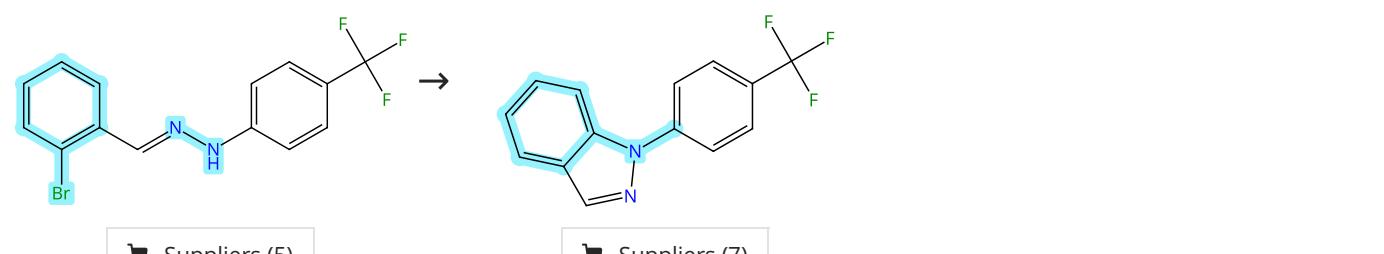
Synthesis of Unsymmetrical Diarylureas via Pd-Catalyzed C-N Cross-Coupling Reactions

By: Breitler, Simon; et al

Organic Letters (2011), 13(12), 3262-3265.

Experimental Protocols

Scheme 309 (1 Reaction)

[Suppliers \(5\)](#)[Suppliers \(7\)](#)

31-172-CAS-12103414

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Tripotassium phosphate, Bis[2-(diphenylphosphino)phenyl] ether
Catalysts: Bis(dibenzylideneacetone)palladium
Solvents: Toluene; 12 h, 110 °C; 110 °C → rt

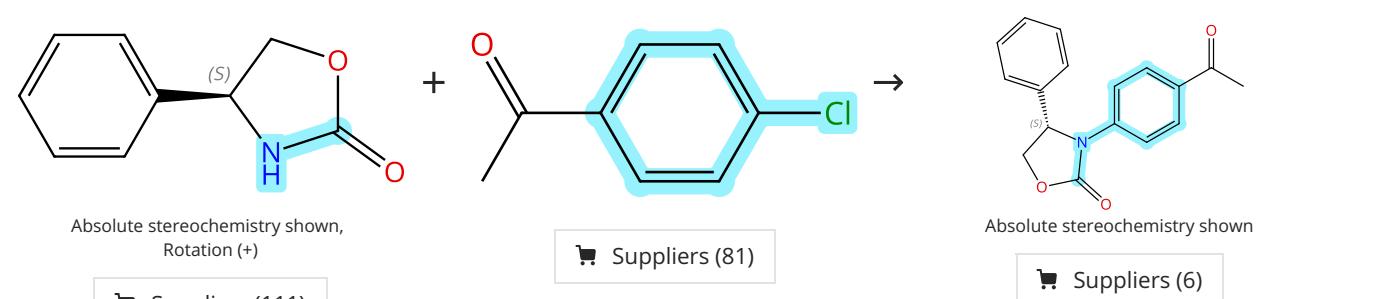
Synthesis of 1-aryl-1H-indazoles via palladium-catalyzed intramolecular amination of aryl halides

By: Lebedev, Artyom Y.; et al

Journal of Organic Chemistry (2005), 70(2), 596-602.

Experimental Protocols

Scheme 310 (1 Reaction)

Absolute stereochemistry shown,
Rotation (+)[Suppliers \(111\)](#)[Suppliers \(81\)](#)

Absolute stereochemistry shown

[Suppliers \(6\)](#)

31-172-CAS-1583094

Steps: 1 Yield: 97%

- 1.1 **Reagents:** Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene; 17 h, 115 °C

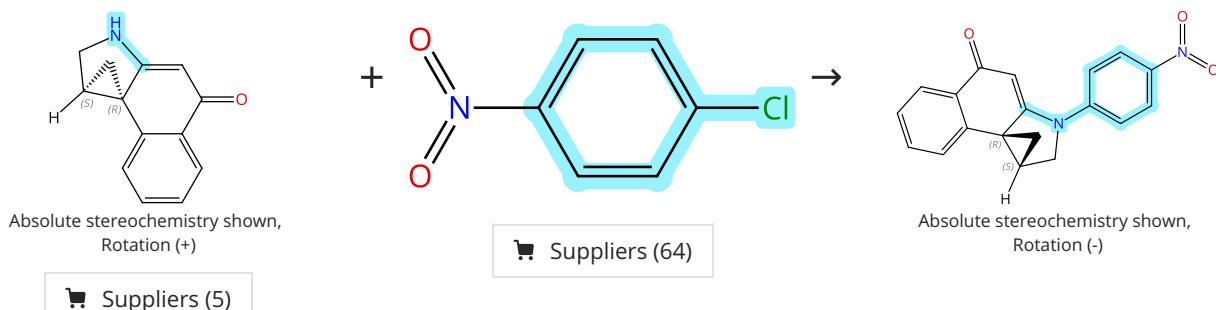
Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Experimental Protocols

Scheme 311 (1 Reaction)



31-172-CAS-11100409

Steps: 1 Yield: 96%

- 1.1 **Reagents:** Cesium carbonate, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine
Catalysts: Tris(dibenzylideneacetone)dipalladium
Solvents: Tetrahydrofuran; 3 - 6 h, 80 °C

Experimental Protocols

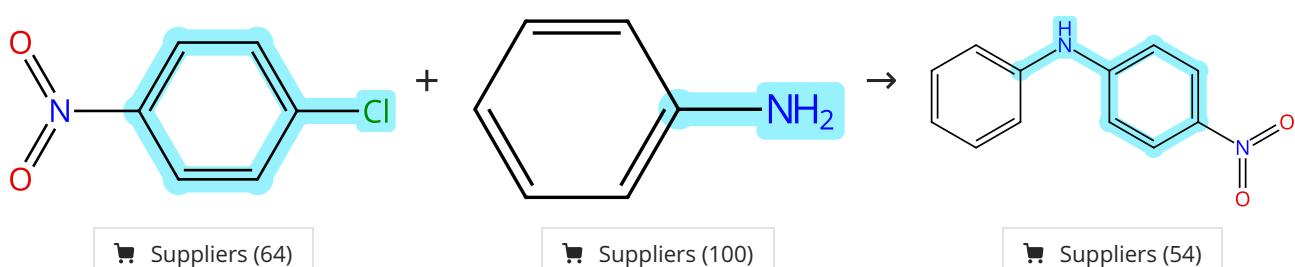
Establishing the Parabolic Relationship between Reactivity and Activity for Derivatives and Analogues of the Duocarmycin and CC-1065 Alkylation Subunits

By: Parrish, Jay P.; et al

Journal of the American Chemical Society (2004), 126(1), 80-81.

Scheme 312 (2 Reactions)

Steps: 1 Yield: 95-96%



31-172-CAS-4396364

Steps: 1 Yield: 96%

- 1.1 **Reagents:** Potassium hydroxide, Water
Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tri-tert*-butylphosphine)palladium
Solvents: Toluene

Experimental Protocols

Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

31-172-CAS-1207547

Steps: 1 Yield: 95%

- 1.1 **Reagents:** Tripotassium phosphate
Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene
Solvents: 1,2-Dimethoxyethane

Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 313 (1 Reaction)

Steps: 1 Yield: 96%



31-172-CAS-3483945

Steps: 1 Yield: 96%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 5-[Bis(1,1-dimethylethyl)phosphino]-1',3',5'-triphenyl-1,4'-bi-1*H*-pyrazole

Solvents: 1,2-Dimethoxyethane; 1 h, rt

1.2 rt; rt → 85 °C; 2 h, 85 °C; 85 °C → rt

1.3 Solvents: Dimethylformamide; 30 min, rt

Experimental Protocols

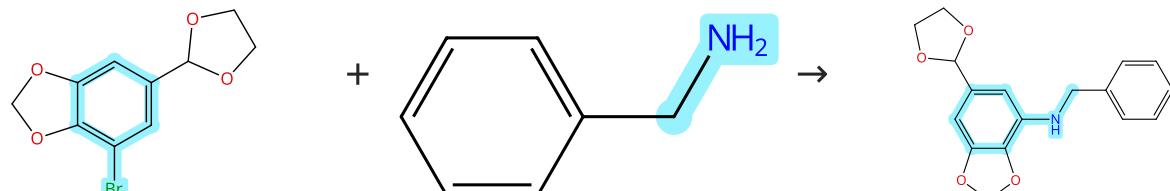
A General Method for the Synthesis of Unsymmetrically Substituted Ureas via Palladium-Catalyzed Amidation

By: Kotecki, Brian J.; et al

Organic Letters (2009), 11(4), 947-950.

Scheme 314 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (4)

Suppliers (82)

31-172-CAS-14961127

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide, (-)-BINAP

Catalysts: Tris(dibenzylideneacetone)dipalladium

1.2 Solvents: Toluene

1.3 Solvents: Diethyl ether

Experimental Protocols

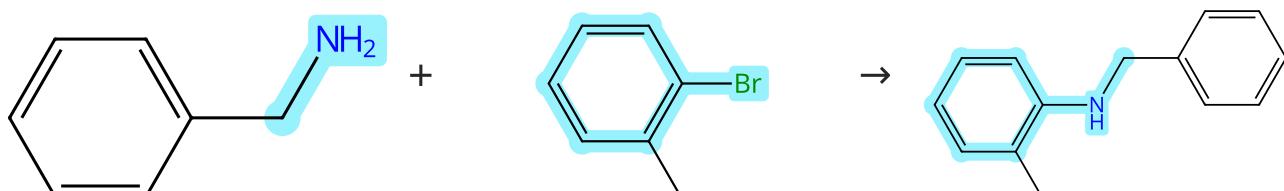
Synthesis of 8-Methoxy-1-methyl-1*H*-benzo[de][1,6]naphthyridin-9-ol (Isoaaptamine) and Analogues

By: Walz, Andrew J.; et al

Journal of Organic Chemistry (2000), 65(23), 8001-8010.

Scheme 315 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (82)

Suppliers (65)

Suppliers (28)

31-172-CAS-8590104

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

Experimental Protocols

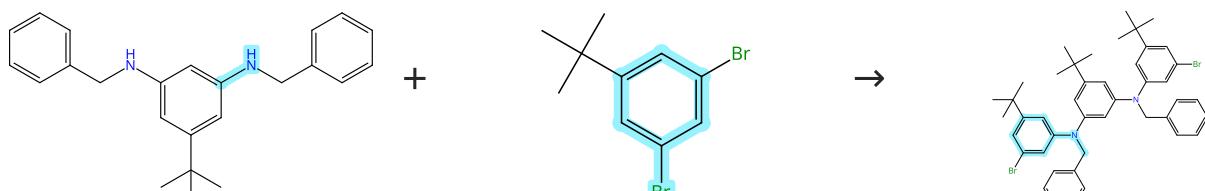
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 316 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (2)

Suppliers (79)

31-172-CAS-2271617

Steps: 1 Yield: 96%

Synthesis, Structure, and Conformation of Aza[1_n]metacyclophanes

By: Vale, Matthew; et al

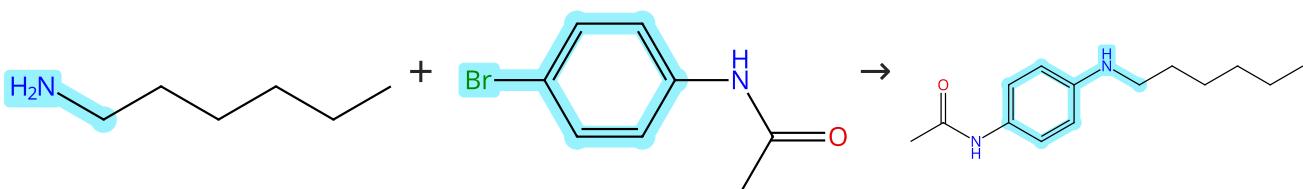
Journal of Organic Chemistry (2008), 73(1), 27-35.

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Palladium diacetate, 1,1-Bis(diphenylphosphino)ferrocene

Experimental Protocols

Scheme 317 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (69)

Suppliers (82)

Suppliers (6)

31-172-CAS-9682105

Steps: 1 Yield: 96%

Expanding Pd-Catalyzed C-N Bond-Forming Processes: The First Amidation of Aryl Sulfonates, Aqueous Amination, and Complementarity with Cu-Catalyzed Reactions

By: Huang, Xiaohua; et al

Journal of the American Chemical Society (2003), 125(22), 6653-6655.

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, X-Phos

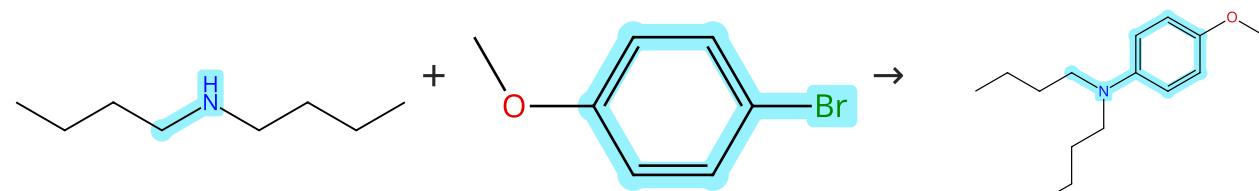
Solvents: Toluene; 2 h, 90 °C

1.2 Reagents: Water

Experimental Protocols

Scheme 318 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (63)

Suppliers (79)

Suppliers (2)

31-172-CAS-11079073

Steps: 1 Yield: 96%

Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides

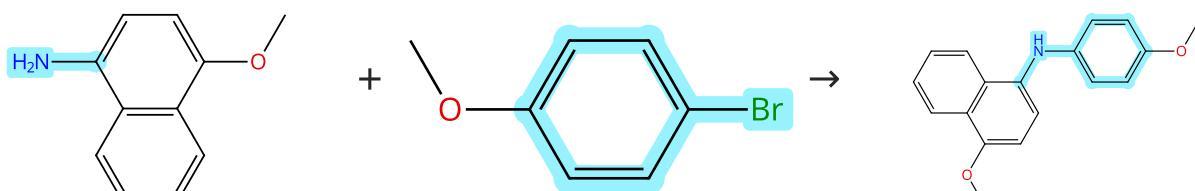
By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2006), 71(14), 5117-5125.

Experimental Protocols

Scheme 319 (1 Reaction)

Steps: 1 Yield: 96%



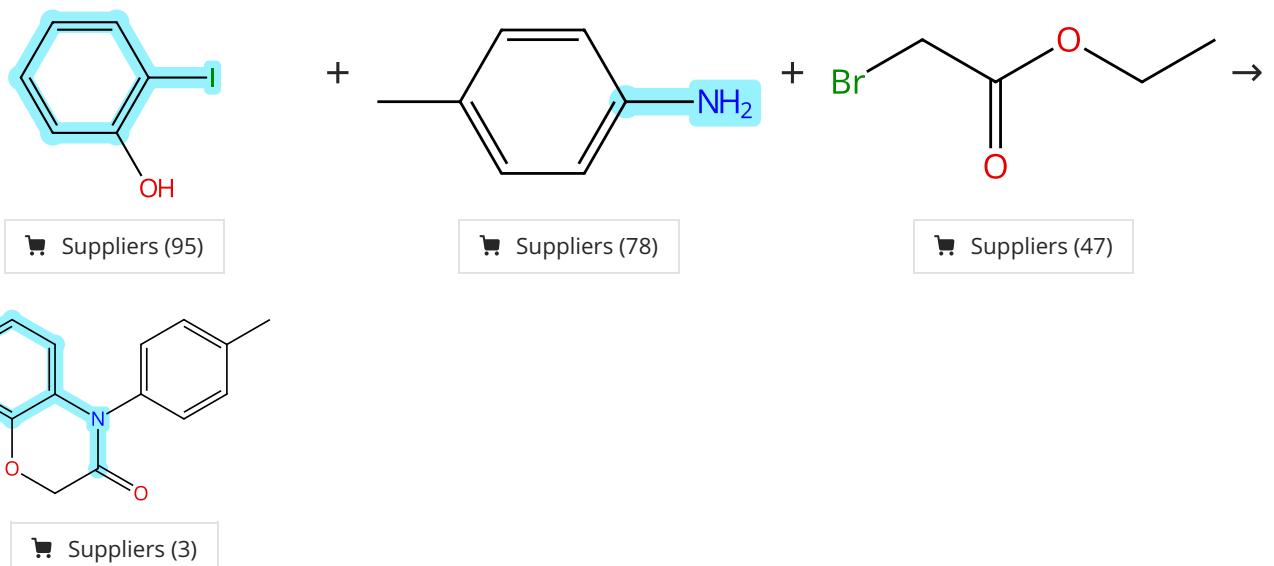
Suppliers (38)

Suppliers (79)

Supplier (1)

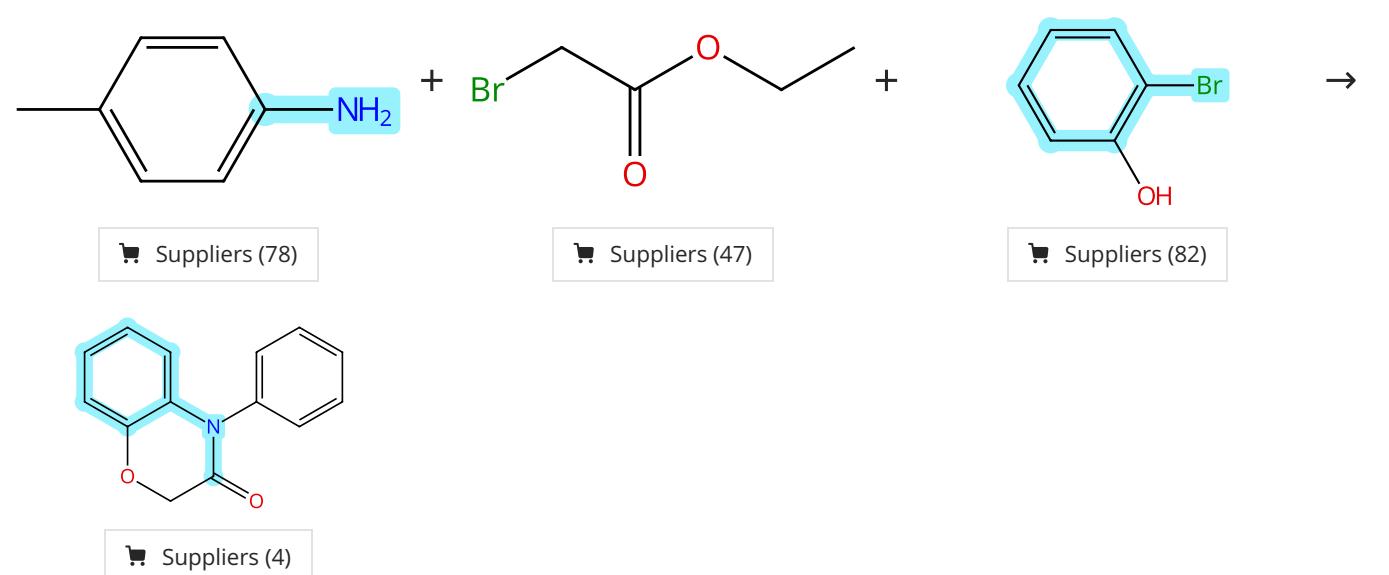
31-172-CAS-14799528	Steps: 1 Yield: 96%	Design, synthesis, and structure-activity relationship of N-arylnaphthylamine derivatives as amyloid aggregation inhibitors By: Di Santo, Roberto; et al Journal of Medicinal Chemistry (2012), 55(19), 8538-8548.
1.1 Catalysts: Palladium diacetate, BINAP Solvents: Toluene; 30 s, rt; 1 min, rt		
1.2 Reagents: Cesium carbonate Solvents: Toluene; rt → 80 °C; 21 h, 80 °C		

Scheme 320 (1 Reaction)



31-008-CAS-7766645	Steps: 1 Yield: 96%	Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2H-1,4-benzoxazines: an improved catalytic system and multicomponent process By: Feng, Gaofeng; et al Synthesis (2013), 45(19), 2711-2718.
1.1 Reagents: Cesium carbonate Catalysts: Palladium diacetate, X-Phos Solvents: Toluene; 3 h, 150 °C		
Experimental Protocols		

Scheme 321 (1 Reaction)



31-008-CAS-14053881

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate
 Catalysts: Palladium diacetate, X-Phos
 Solvents: Toluene; 3 h, 150 °C

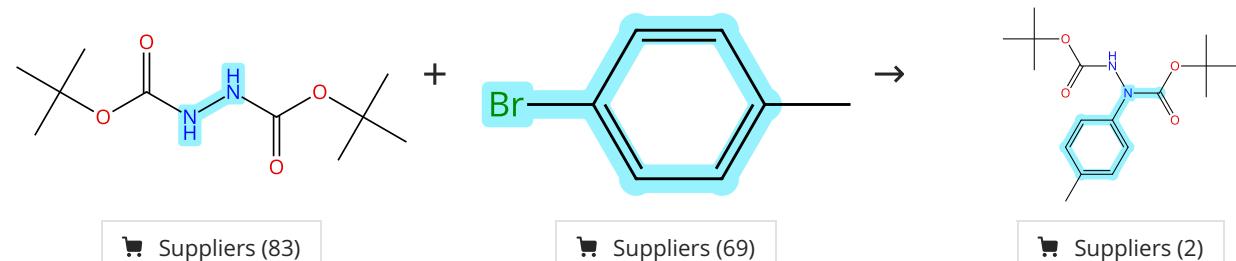
Experimental Protocols

Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2H-1,4-benzoxazines: an improved catalytic system and multicomponent process

By: Feng, Gaofeng; et al

Synthesis (2013), 45(19), 2711-2718.

Scheme 322 (1 Reaction)



Steps: 1 Yield: 96%

31-172-CAS-6208666

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate
 Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine
 Solvents: 1,4-Dioxane; 20 h, 100 °C

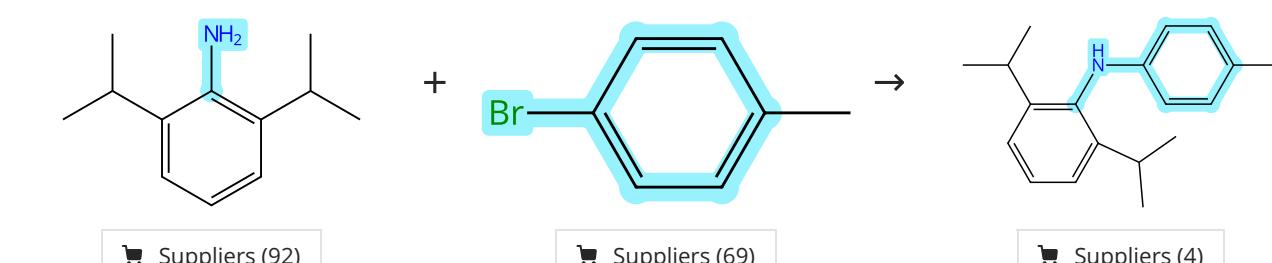
Experimental Protocols

An efficient Pd-catalyzed coupling of hydrazine derivatives with aryl halides

By: Ma, Fang-Fang; et al

Synlett (2011), (17), 2555-2558.

Scheme 323 (1 Reaction)



Steps: 1 Yield: 96%

31-172-CAS-10478443

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide
 Catalysts: Tris(dibenzylideneacetone)dipalladium, Tris(2,2-dimethylpropyl)phosphine; rt
 1.2 Solvents: Toluene; 1 h, 80 °C

Experimental Protocols

Trineopentylphosphine: a conformationally flexible ligand for the coupling of sterically demanding substrates in the Buchwald-Hartwig amination and Suzuki-Miyaura reaction

By: Raders, Steven M.; et al

Journal of Organic Chemistry (2013), 78(10), 4649-4664.

Scheme 324 (1 Reaction)



Steps: 1 Yield: 96%

31-172-CAS-9373969

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-, chloride (1:1)

Solvents: 1,4-Dioxane

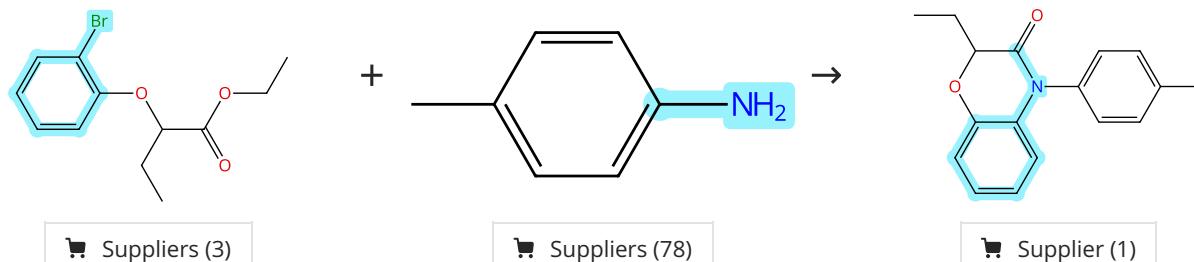
Experimental Protocols

Amination Reactions of Aryl Halides with Nitrogen-Containing Reagents Mediated by Palladium/Imidazolium Salt Systems

By: Grasa, Gabriela A.; et al

Journal of Organic Chemistry (2001), 66(23), 7729-7737.

Scheme 325 (1 Reaction)



31-172-CAS-14867851

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 24 h, 90 °C

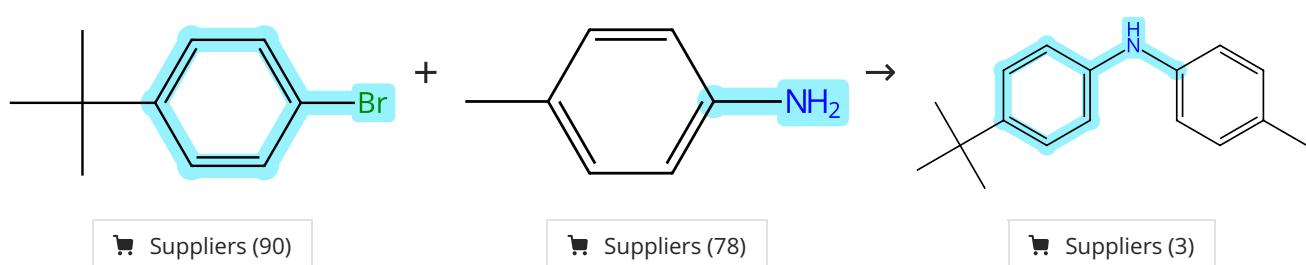
Experimental Protocols

A Pd-catalyzed cascade protocol towards 2-alkyl-4-aryl-4H-benz[1,4]oxazin-3-ones from aryl amines and 2-(2-halophenoxy)alkanoates

By: Feng, Gaofeng; et al

Synlett (2012), 23(4), 601-606.

Scheme 326 (1 Reaction)



31-172-CAS-4915036

Steps: 1 Yield: 96%

1.1 Reagents: Sodium hydroxide

Catalysts: Phenylboronic acid, Palladium diacetate

Solvents: Water; 4 h, 110 °C; 110 °C → rt

Experimental Protocols

Expanding Pd-Catalyzed C-N Bond-Forming Processes: The First Amidation of Aryl Sulfonates, Aqueous Amination, and Complementarity with Cu-Catalyzed Reactions

By: Huang, Xiaohua; et al

Journal of the American Chemical Society (2003), 125(22), 6653-6655.

Scheme 327 (1 Reaction)



31-172-CAS-12969954

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 48 h, 100 °C

Experimental Protocols

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 328 (2 Reactions)



Suppliers (2)

Suppliers (89)

Suppliers (2)

Steps: 1 Yield: 96%

31-172-CAS-13820971

Steps: 1 Yield: 96%

1.1 Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 1 min, rt1.2 Reagents: Sodium *tert*-butoxide; 2.5 h, 80 °C

Experimental Protocols

Application of a Sequential Multicomponent Assembly Process/Huisgen Cycloaddition Strategy to the Preparation of Libraries of 1,2,3-Triazole-Fused 1,4-Benzodiazepines

By: Donald, James R.; et al

ACS Combinatorial Science (2012), 14(2), 135-143.

31-172-CAS-13215835

Steps: 1 Yield: 96%

1.1 Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 1 min, rt1.2 Reagents: Potassium *tert*-butoxide; 2.5 h, 80 °C

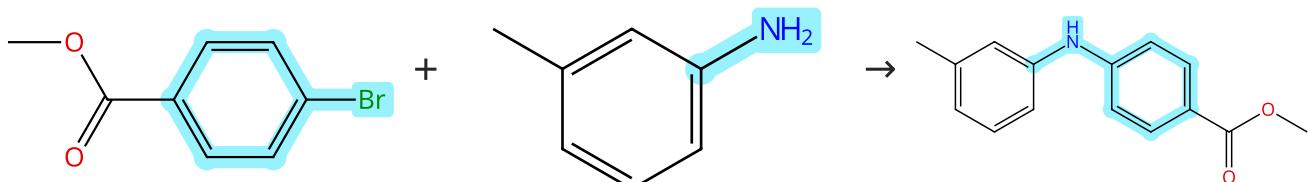
Experimental Protocols

Synthesis and diversification of 1,2,3-triazole-fused 1,4-Benzodiazepine scaffolds

By: Donald, James R.; et al

Organic Letters (2011), 13(5), 852-855.

Scheme 329 (1 Reaction)



Suppliers (100)

Suppliers (74)

Supplier (1)

Steps: 1 Yield: 96%

31-172-CAS-9261189

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, BINAP

Solvents: Toluene; 4 - 48 h, 120 °C

Experimental Protocols

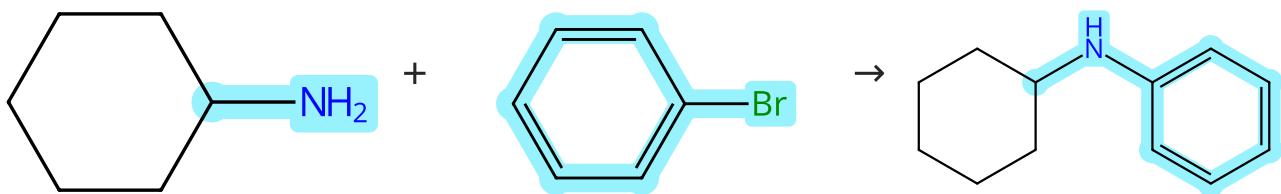
Development of Potent and Selective Inhibitors of Aldo-Keto Reductase 1C3 (Type 5 17 β -Hydroxysteroid Dehydrogenase) Based on N-Phenyl-Aminobenzoates and Their Structure-Activity Relationships

By: Adeniji, Adegoke O.; et al

Journal of Medicinal Chemistry (2012), 55(5), 2311-2323.

Scheme 330 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (79)

Suppliers (74)

Suppliers (75)

31-172-CAS-13210893

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene
Solvents: 1,2-Dimethoxyethane; 24 h, 100 °C

Experimental Protocols

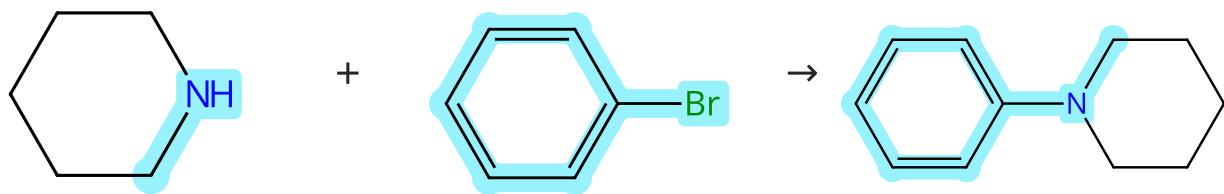
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 331 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (51)

Suppliers (74)

Suppliers (65)

31-172-CAS-8689855

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxide

Catalysts: Palladium

Solvents: Xylene; 7 h, 130 °C

Experimental Protocols

Development of Second Generation Gold-Supported Palladium Material with Low-Leaching and Recyclable Characteristics in Aromatic Amination

By: Al-Amin, Mohammad; et al

Journal of Organic Chemistry (2013), 78(15), 7575-7581.

Scheme 332 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (83)

Suppliers (74)

Suppliers (3)

31-172-CAS-778930

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethyl ethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine

Solvents: 1,4-Dioxane; 20 h, 100 °C

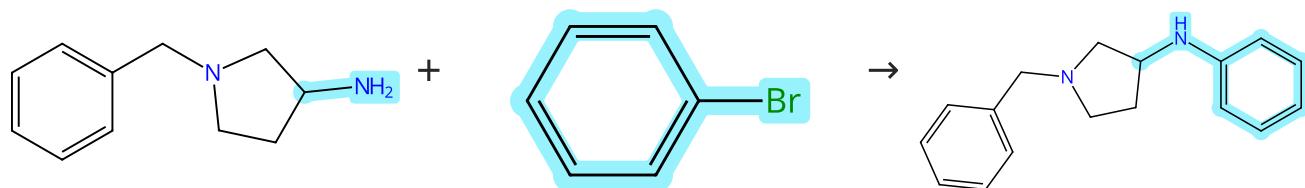
Experimental Protocols

An efficient Pd-catalyzed coupling of hydrazine derivatives with aryl halides

By: Ma, Fang-Fang; et al

Synlett (2011), (17), 2555-2558.

Scheme 333 (1 Reaction)



Suppliers (78)

Suppliers (74)

Suppliers (9)

31-172-CAS-14369834

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Dicyclohexylphosphino)biphenyl

Solvents: Toluene; 24 h, 130 °C

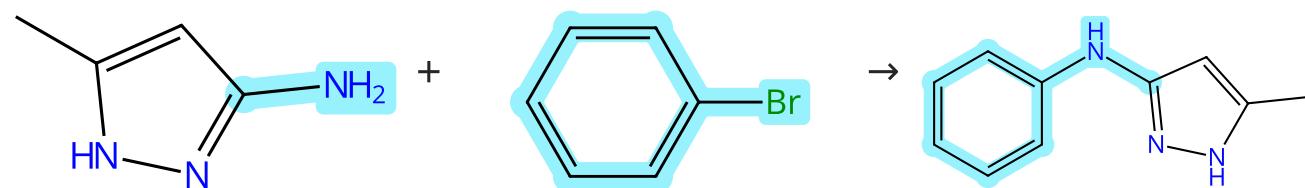
Palladium-Mediated Arylation of 3-Aminopiperidines and 3-Aminopyrrolidines

By: Jean, Ludovic; et al

Journal of Organic Chemistry (2004), 69(25), 8893-8902.

Experimental Protocols

Scheme 334 (1 Reaction)



Suppliers (142)

Suppliers (74)

Suppliers (9)

31-172-CAS-5195342

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Bis(1,1-dimethylethyl)[2',4',6'-tris(1-methylethyl)][1,1'-biphenyl]-2-yl]phosphine, (*SP*-4-4)-[2-[2-(Amino- κ N)ethyl]phenyl- κ C]chloro[dicyclohexyl[2',4',6'-tris(1-methylethyl)][1,1'-biphenyl]-2-yl]phosphine]palladiumSolvents: *tert*-Butanol; 4 h, rt

Room-temperature palladium-catalyzed coupling of heteroaryl amines with aryl or heteroaryl bromides

By: Moss, Thomas A.; et al

Synlett (2012), 23(2), 285-289.

Experimental Protocols

Scheme 335 (2 Reactions)



Suppliers (76)

Suppliers (74)

Suppliers (83)

31-172-CAS-3967502

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Catalysts: Tris(dibenzylideneacetone)dipalladium

Solvents: 1,4-Dioxane

Pd-Catalyzed Intermolecular Amidation of Aryl Halides: The Discovery that Xantphos Can Be Trans-Chelating in a Palladium Complex

By: Yin, Jingjun; et al

Journal of the American Chemical Society (2002), 124(21), 6043-6048.

Experimental Protocols

31-172-CAS-928020

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane

Experimental Protocols

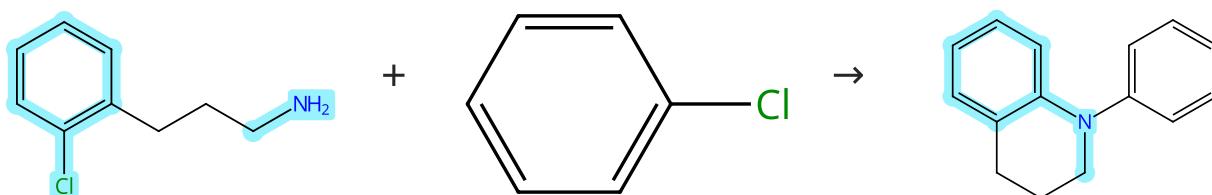
Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Scheme 336 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (58)

Suppliers (136)

Suppliers (7)

31-172-CAS-7723808

Steps: 1 Yield: 96%

1.1 Reagents: *tert*-Butanol, Sodium hydrideCatalysts: Palladium diacetate, 1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene

Solvents: 1,4-Dioxane; 15 min, 100 °C

1.2 Solvents: 1,4-Dioxane; 4 h, 100 °C

1.3 Solvents: 1,4-Dioxane; 6 h, 100 °C; 100 °C → rt

Experimental Protocols

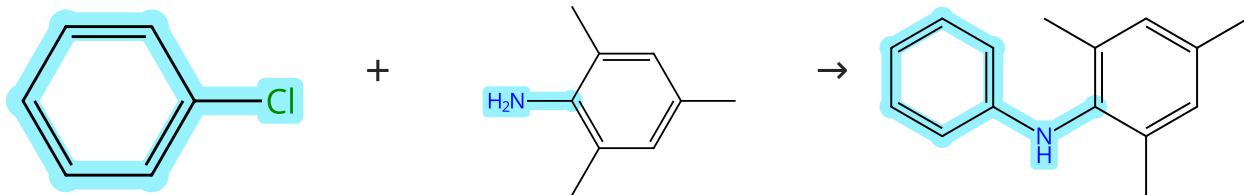
Novel synthetic strategy of N-arylated heterocycles via sequential palladium-catalyzed intra- and inter-arylation reactions

By: Omar-Amrani, Rafik; et al

Synthesis (2004), (15), 2527-2534.

Scheme 337 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (136)

Suppliers (85)

Suppliers (18)

31-172-CAS-4016252

Steps: 1 Yield: 96%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole-*KN*³⁻)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

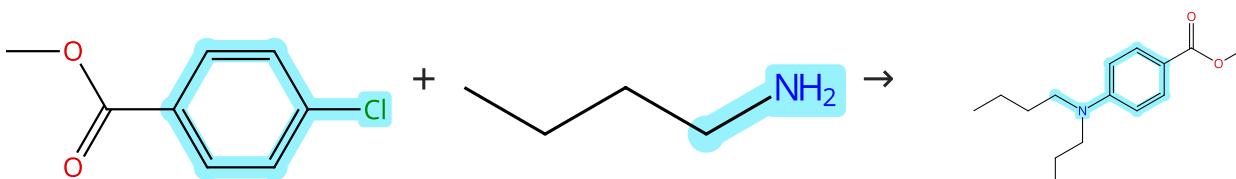
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 338 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (99)

Suppliers (72)

Suppliers (5)

31-172-CAS-2910231

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Bis(dibenzylideneacetone)palladium, Dicyclohexyl(2'-methoxy[1,1'-binaphthalen]-2-yl)phosphine

Solvents: 1,2-Dimethoxyethane; rt; 16 h, 110 °C

Experimental Protocols

Synthesis of Bulky and Electron-Rich MOP-type Ligands and Their Applications in Palladium-Catalyzed C-N Bond Formation

By: Xie, Xiaomin; et al

Journal of Organic Chemistry (2006), 71(17), 6522-6529.

Scheme 339 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (4)

Suppliers (72)

Supplier (1)

31-172-CAS-1557930

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2-(Dicyclohexylphosphino)biphenyl

Solvents: Tetrahydrofuran; 48 h, 100 °C

Experimental Protocols

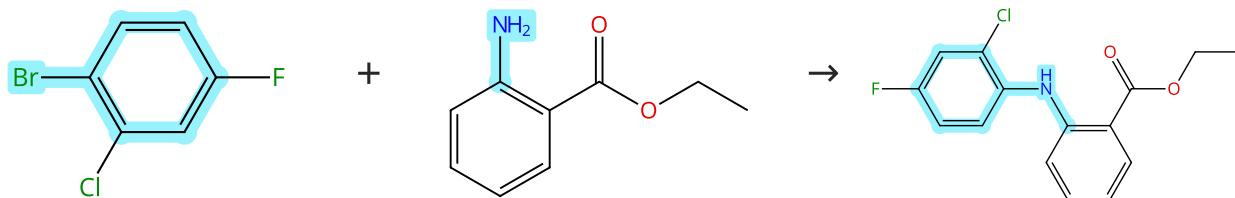
General and Efficient Synthesis of Arylamino- and Alkylamino-Substituted Diphenylporphyrins and Tetraphenylporphyrins via Palladium-Catalyzed Multiple Amination Reactions

By: Gao, Guangyao Y.; et al

Journal of Organic Chemistry (2003), 68(16), 6215-6221.

Scheme 340 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (84)

Suppliers (68)

Supplier (1)

31-172-CAS-5051394

Steps: 1 Yield: 96%

1.1 Reagents: Potassium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, Dicyclohexyl[3,6-dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine

Solvents: *tert*-Butanol; 5 h, 100 °C

Experimental Protocols

Concise Palladium-Catalyzed Synthesis of Dibenzodiazepines and Structural Analogues

By: Tsvelikhovsky, Dmitry; et al

Journal of the American Chemical Society (2011), 133(36), 14228-14231.

Scheme 341 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (102)

Suppliers (51)

Suppliers (60)

31-172-CAS-13189043

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 5 min, rt

Experimental Protocols

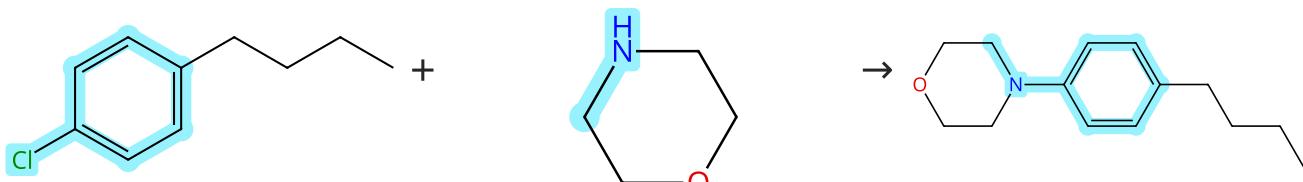
Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 342 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (56)

Suppliers (76)

Suppliers (5)

31-172-CAS-11656073

Steps: 1 Yield: 96%

1.1 Reagents: Potassium hydroxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, X-Phos

Solvents: Water; rt \rightarrow 110 °C; 16 h, 110 °C

Experimental Protocols

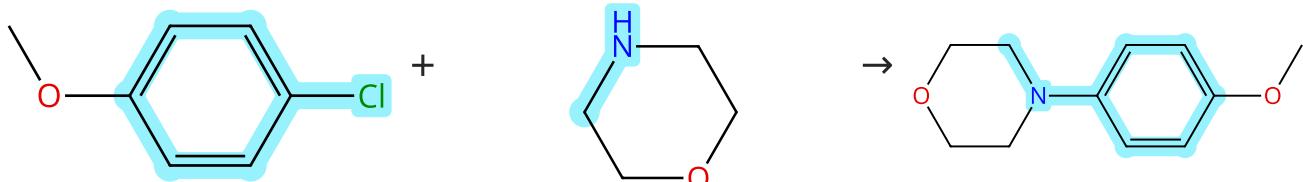
Expanding Pd-Catalyzed C-N Bond-Forming Processes: The First Amidation of Aryl Sulfonates, Aqueous Amination, and Complementarity with Cu-Catalyzed Reactions

By: Huang, Xiaohua; et al

Journal of the American Chemical Society (2003), 125(22), 6653-6655.

Scheme 343 (2 Reactions)

Steps: 1 Yield: 95-96%



Suppliers (79)

Suppliers (76)

Suppliers (65)

31-172-CAS-14529959

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1*H*-Imidazolium, 1,3-bis[2,6-bis(1-methylethyl)phenyl]-4,5-dihydro-, tetrafluoroborate(1-) (1:1)

Solvents: 1,2-Dimethoxyethane

Experimental Protocols

High turnover number and rapid, room-temperature amination of chloroarenes using saturated carbene ligands

By: Stauffer, Shaun R.; et al

Organic Letters (2000), 2(10), 1423-1426.

31-172-CAS-9068256

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

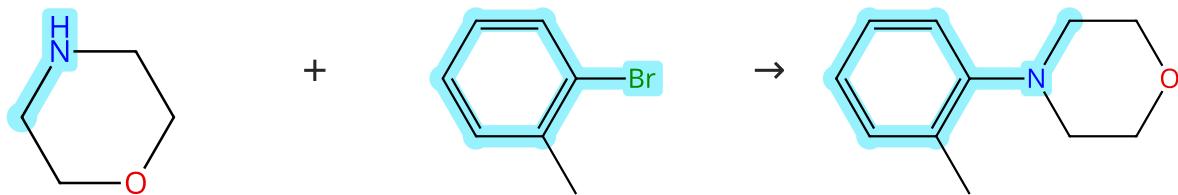
Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 344 (2 Reactions)



Suppliers (76)

Suppliers (65)

Suppliers (18)

31-172-CAS-10295442

Steps: 1 Yield: 96%

(IPr)Pd(acac)Cl: An Easily Synthesized, Efficient, and Versatile Precatalyst for C-N and C-C Bond Formation

By: Marion, Nicolas; et al

Journal of Organic Chemistry (2006), 71(10), 3816-3821.

Experimental Protocols

31-172-CAS-9256192

Steps: 1 Yield: 96%

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

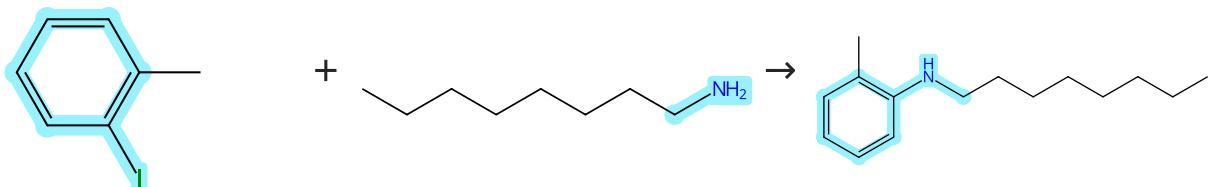
By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Experimental Protocols

Scheme 345 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (85)

Suppliers (77)

Suppliers (4)

31-172-CAS-8348632

Steps: 1 Yield: 96%

Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

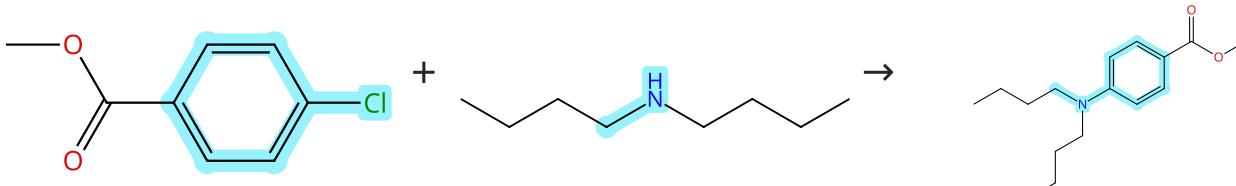
By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Experimental Protocols

Scheme 346 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (99)

Suppliers (63)

Suppliers (5)

31-172-CAS-10334433

Steps: 1 Yield: 96%

1.1 Reagents: Tripotassium phosphate

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: 1,2-Dimethoxyethane

Experimental Protocols

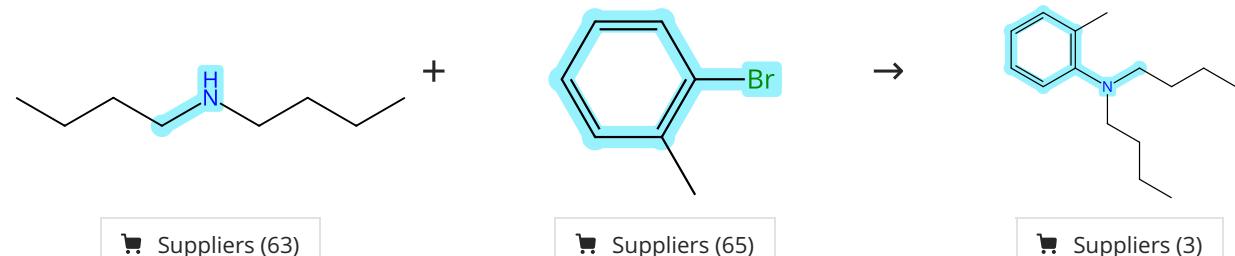
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 347 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (63)

Suppliers (65)

Suppliers (3)

31-172-CAS-14555876

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: (*SP*-4-2)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chloro(2,4-pentanedionato- $\kappa O^2,\kappa O^4$)palladium

Solvents: 1,2-Dimethoxyethane; 6 h, rt

Experimental Protocols

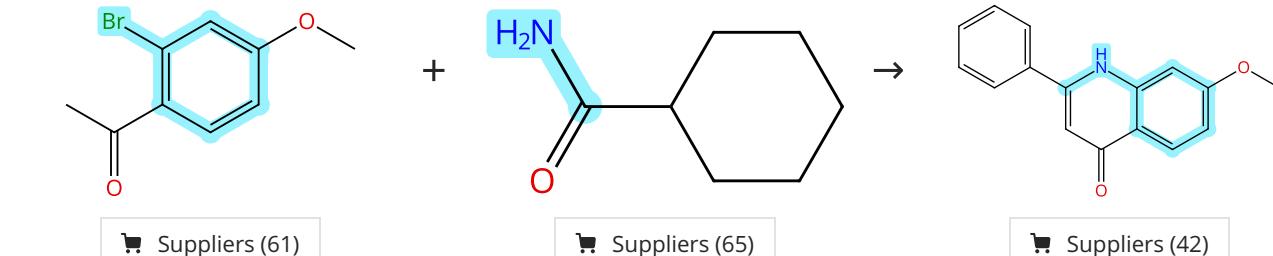
(IPr)Pd(acac)Cl: An Easily Synthesized, Efficient, and Versatile Precatalyst for C-N and C-C Bond Formation

By: Marion, Nicolas; et al

Journal of Organic Chemistry (2006), 71(10), 3816-3821.

Scheme 348 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (61)

Suppliers (65)

Suppliers (42)

31-172-CAS-4109065

Steps: 1 Yield: 96%

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane; 5 - 10 min, rt

1.2 Reagents: Cesium carbonate; 2 h, 100 °C; 100 °C → < 80 °C

1.3 Reagents: Sodium *tert*-butoxide; 2 h, 100 °C

Experimental Protocols

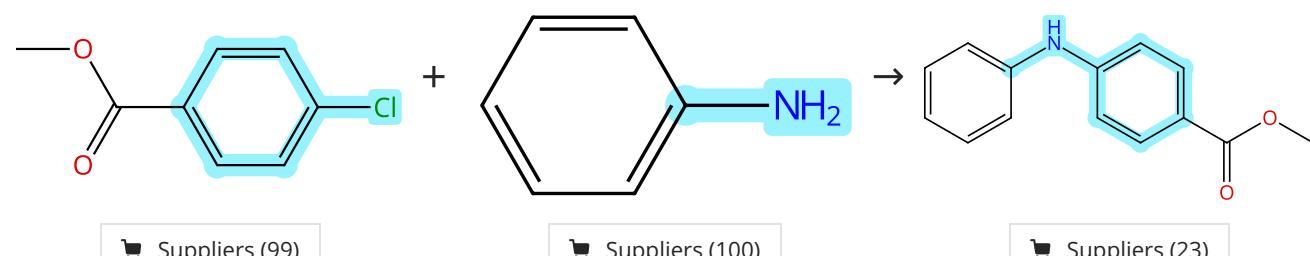
A mild, one-pot synthesis of 4-quinolones via sequential Pd-catalyzed amidation and base-promoted cyclization

By: Huang, Jinkun; et al

Organic Letters (2008), 10(12), 2609-2612.

Scheme 349 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (99)

Suppliers (100)

Suppliers (23)

31-172-CAS-8214486

Steps: 1 Yield: 96%

1.1 Reagents: Tripotassium phosphate

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: 1,2-Dimethoxyethane

Experimental Protocols

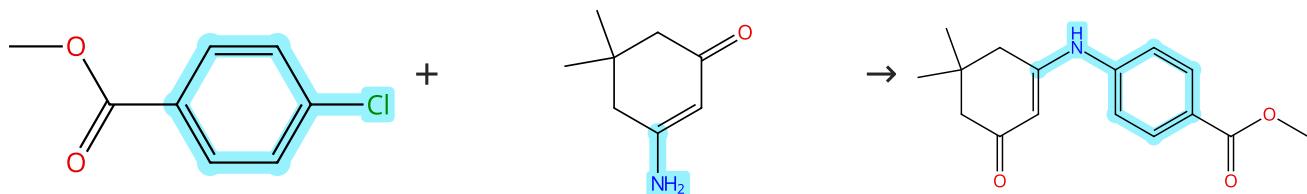
Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 350 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (99)

Suppliers (67)

Suppliers (5)

31-172-CAS-14618697

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-N,N-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

Experimental Protocols

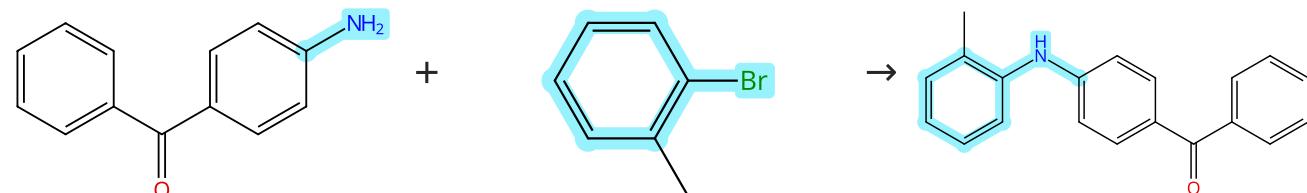
Palladium-catalyzed coupling of vinylgous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 351 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (89)

Suppliers (65)

Suppliers (3)

31-172-CAS-4535426

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, X-Phos

Solvents: *tert*-Butanol, Toluene; 6 min, 120 °C

Experimental Protocols

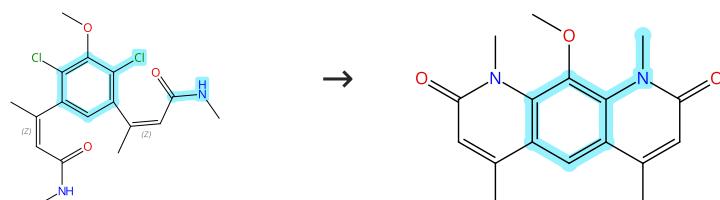
Rapid and efficient microwave-assisted synthesis of aryl aminobenzophenones using Pd-catalyzed amination

By: Jensen, Thomas A.; et al

Journal of Organic Chemistry (2004), 69(15), 4936-4947.

Scheme 352 (1 Reaction)

Steps: 1 Yield: 96%



Double bond geometry shown

Suppliers (3)

Suppliers (2)

31-172-CAS-669943

Steps: 1 Yield: 96%

1.1 Reagents: Potassium carbonate
Catalysts: Palladium, X-Phos
Solvents: Isopropanol; rt; 16 h, 110 °C

Experimental Protocols

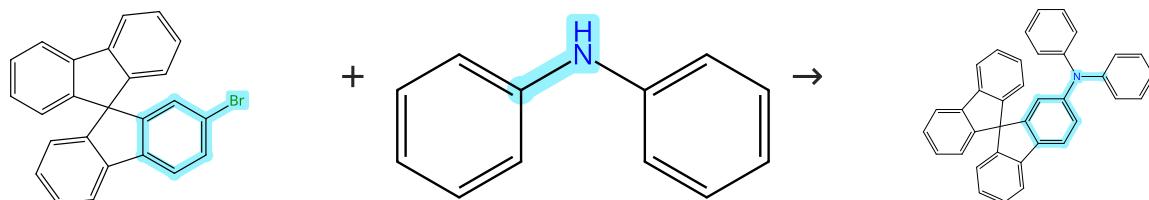
Chemistry and Biology of Deoxyxybo quinone, a Potent Inducer of Cancer Cell Death

By: Bair, Joseph S.; et al

Journal of the American Chemical Society (2010), 132(15), 5469-5478.

Scheme 353 (1 Reaction)

Steps: 1 Yield: 96%



🛒 Suppliers (74)

🛒 Suppliers (108)

31-172-CAS-11888038

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; 8 h, reflux

Experimental Protocols

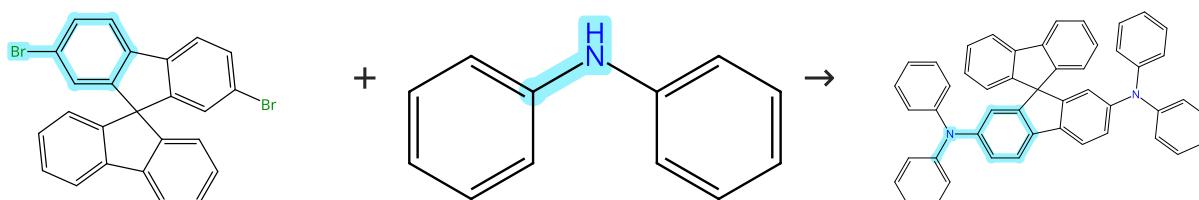
Synthesis, Structures, and Photoinduced Electron Transfer Reaction in the 9,9'-Spirobifluorene-Bridged Bipolar Systems

By: Wong, Ken-Tsung; et al

Journal of Organic Chemistry (2006), 71(2), 456-465.

Scheme 354 (1 Reaction)

Steps: 1 Yield: 96%



🛒 Suppliers (75)

🛒 Suppliers (108)

🛒 Suppliers (2)

31-172-CAS-14019290

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine
Solvents: Toluene; 8 h, reflux

Experimental Protocols

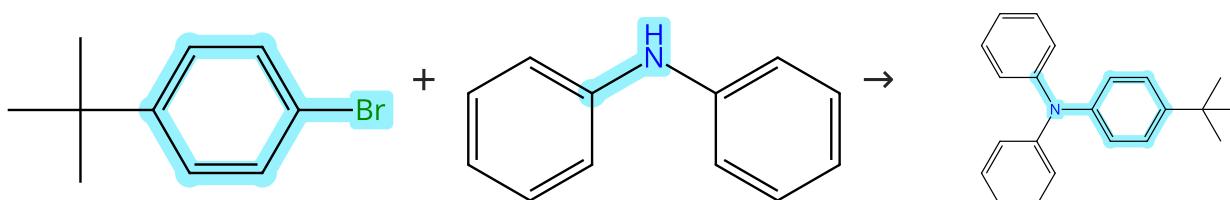
Synthesis, Structures, and Photoinduced Electron Transfer Reaction in the 9,9'-Spirobifluorene-Bridged Bipolar Systems

By: Wong, Ken-Tsung; et al

Journal of Organic Chemistry (2006), 71(2), 456-465.

Scheme 355 (1 Reaction)

Steps: 1 Yield: 96%



🛒 Suppliers (90)

🛒 Suppliers (108)

🛒 Suppliers (2)

31-172-CAS-12295633

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 12 h, 80 °C

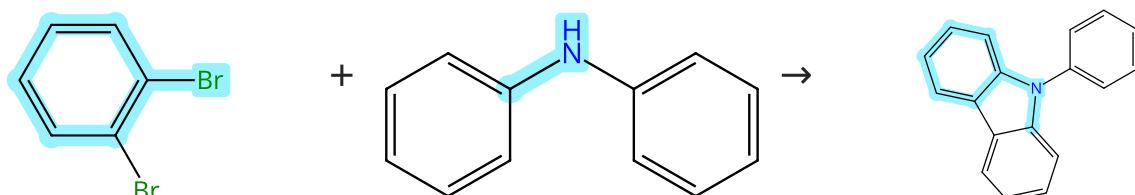
Experimental Protocols

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 356 (1 Reaction)



Suppliers (88)

Suppliers (108)

Suppliers (96)

31-172-CAS-10115188

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tricyclohexylphosphine, Palladium diacetate

Solvents: Toluene; 18 h, 105 °C

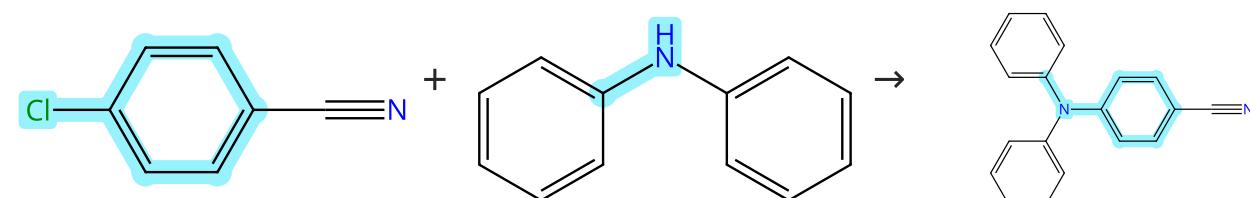
Experimental Protocols

Palladium-catalyzed direct arylation-based domino synthesis of annulated N-heterocycles using alkenyl or (hetero)aryl 1,2-dihalides

By: Ackermann, Lutz; et al

Synthesis (2009), (20), 3493-3503.

Scheme 357 (1 Reaction)



Suppliers (102)

Suppliers (108)

Suppliers (40)

31-172-CAS-890773

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

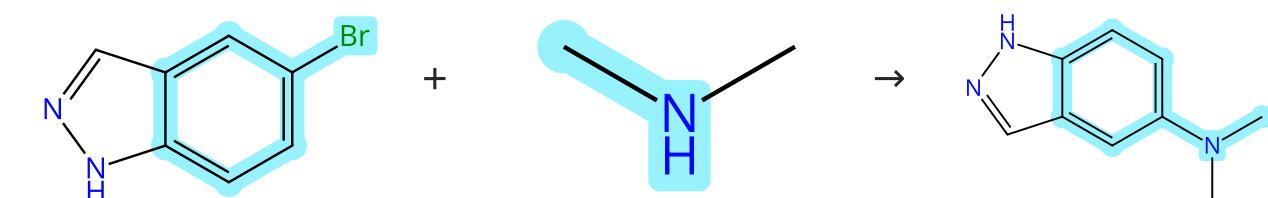
Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 358 (1 Reaction)



Suppliers (111)

Suppliers (123)

Suppliers (47)

31-172-CAS-10236785

Steps: 1 Yield: 96%

- 1.1 **Reagents:** Lithium bis(trimethylsilyl)amide
Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium
Solvents: Tetrahydrofuran; 4 h, 65 °C; 65 °C → rt
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Water; rt
- 1.3 **Reagents:** Sodium bicarbonate
Solvents: Ethyl acetate, Water; rt

Efficient Pd-catalyzed amination reactions for heterocycle functionalization

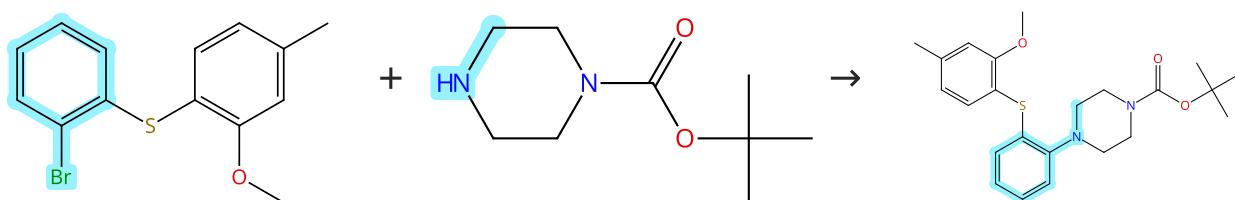
By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Experimental Protocols

Scheme 359 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (2)

Suppliers (130)

Suppliers (2)

31-172-CAS-8436951

Steps: 1 Yield: 96%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; overnight, 100 °C

Discovery of 1-[2-(2,4-Dimethylphenylsulfanyl)phenyl]piperazine (Lu AA21004): A Novel Multimodal Compound for the Treatment of Major Depressive Disorder

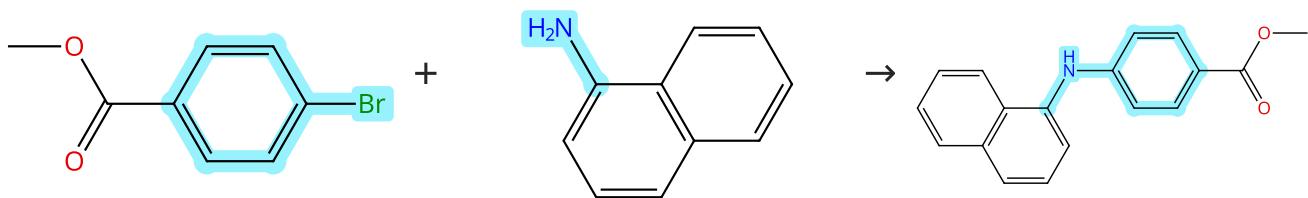
By: Bang-Andersen, Benny; et al

Journal of Medicinal Chemistry (2011), 54(9), 3206-3221.

Experimental Protocols

Scheme 360 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (100)

Suppliers (76)

Suppliers (2)

31-172-CAS-1817398

Steps: 1 Yield: 96%

- 1.1 **Catalysts:** Palladium diacetate, BINAP
Solvents: Toluene; 30 s, rt; 1 min, rt
- 1.2 **Reagents:** Cesium carbonate
Solvents: Toluene; rt → 80 °C; 16 h, 80 °C

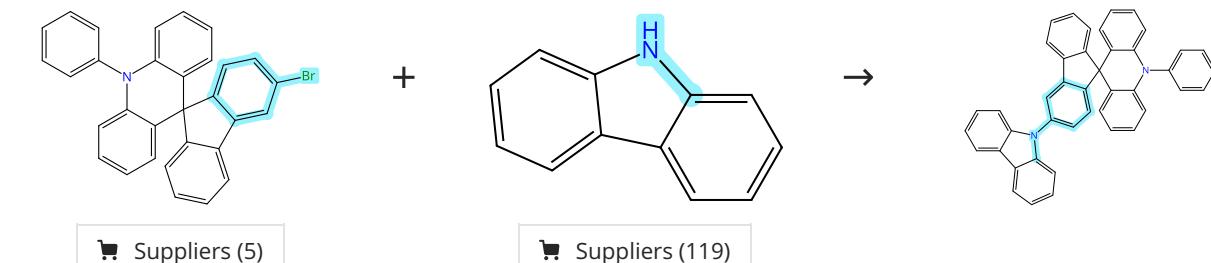
Design, synthesis, and structure-activity relationship of N-arylnaphthylamine derivatives as amyloid aggregation inhibitors

By: Di Santo, Roberto; et al

Journal of Medicinal Chemistry (2012), 55(19), 8538-8548.

Experimental Protocols

Scheme 361 (1 Reaction)



31-172-CAS-7131718

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, Tri-*tert*-butylphosphonium tetrafluoroborate

Solvents: Toluene; 10 h, 110 °C

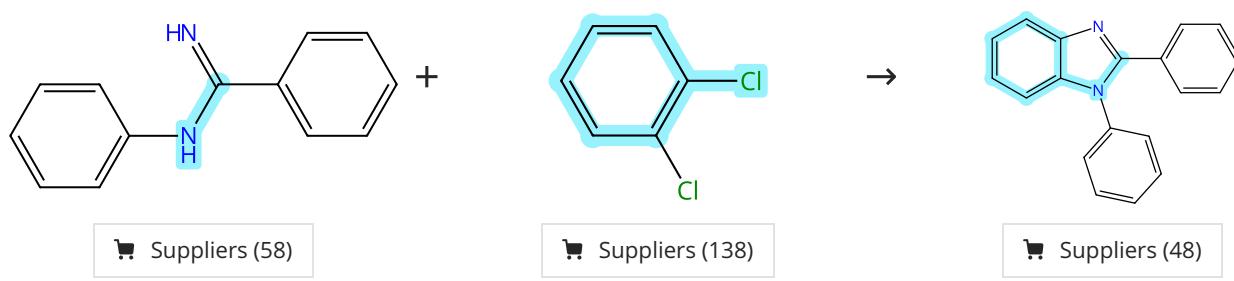
Control of Conjugation Degree via Position Engineering to Highly Efficient Phosphorescent Host Materials

By: Zhang, Ye-Xin; et al

Organic Letters (2014), 16(14), 3748-3751.

Experimental Protocols

Scheme 362 (1 Reaction)



31-172-CAS-10152176

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene; 10 min, rt; 24 h, 140 °C

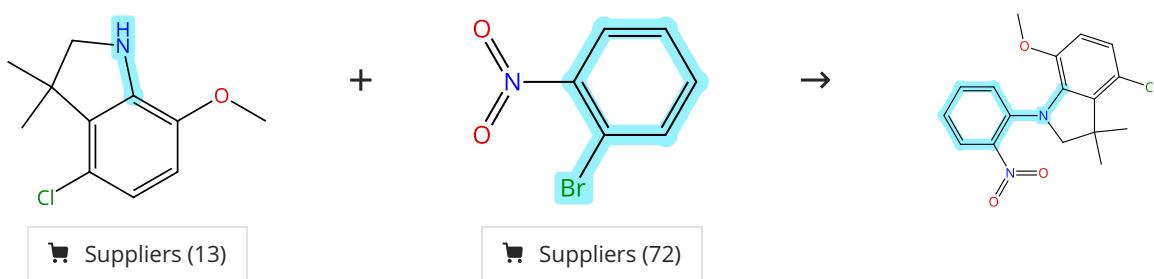
Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Experimental Protocols

Scheme 363 (1 Reaction)



31-172-CAS-7814822

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; 8 h, 85 °C

Discovery of 4-Aryl-7-Hydroxyindoline-Based P2Y₁ Antagonists as Novel Antiplatelet Agents

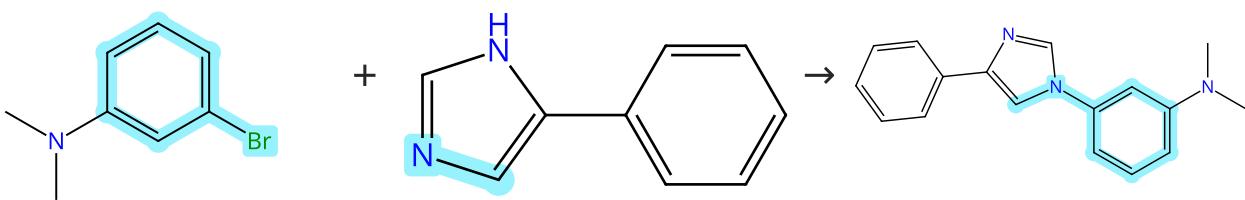
By: Yang, Wu; et al

Journal of Medicinal Chemistry (2014), 57(14), 6150-6164.

Experimental Protocols

Scheme 364 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (96)

Suppliers (96)

Supplier (1)

31-172-CAS-4251003

Steps: 1 Yield: 96%

1.1 Catalysts: Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphine

Solvents: Toluene, 1,4-Dioxane; 3 min, 120 °C

1.2 Reagents: Tripotassium phosphate; 5 h, 120 °C

Experimental Protocols

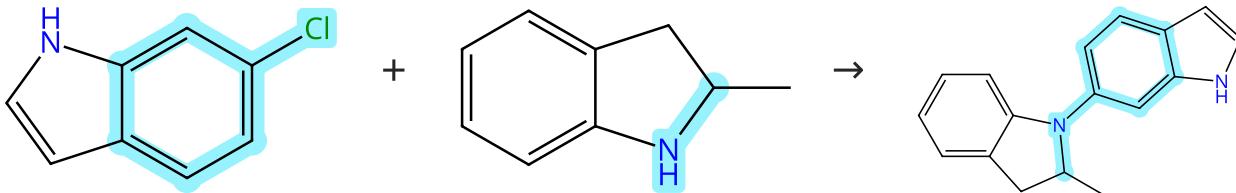
Completely N¹-selective palladium-catalyzed arylation of unsymmetric imidazoles: application to the synthesis of nilotinib

By: Ueda, Satoshi; et al

Journal of the American Chemical Society (2012), 134(1), 700-706.

Scheme 365 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (109)

Suppliers (94)

Suppliers (2)

31-172-CAS-715853

Steps: 1 Yield: 96%

1.1 Reagents: Lithium bis(trimethylsilyl)amide

Catalysts: [2',6'-Bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine, (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C][[2',6'-bis(1-methylethoxy)[1,1'-biphenyl]-2-yl]dicyclohexylphosphine- κ P]chloropalladium

Solvents: Tetrahydrofuran; 4 h, 80 °C; 80 °C → rt

1.2 Reagents: Hydrochloric acid

Solvents: Water; rt

1.3 Reagents: Sodium bicarbonate

Solvents: Ethyl acetate, Water; rt

Experimental Protocols

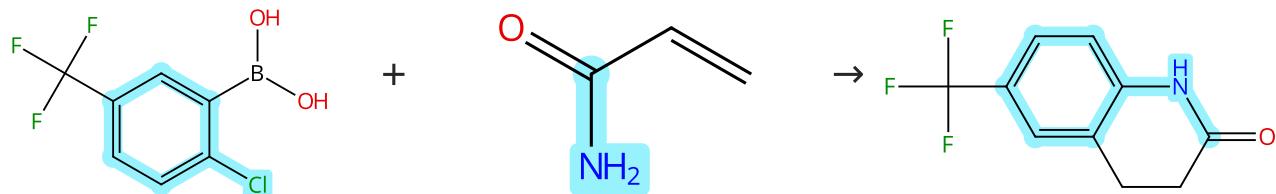
Efficient Pd-catalyzed amination reactions for heterocycle functionalization

By: Henderson, Jaclyn L.; et al

Organic Letters (2010), 12(20), 4442-4445.

Scheme 366 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (90)

Suppliers (165)

Suppliers (17)

31-172-CAS-10853529

Steps: 1 Yield: 96%

1.1 Reagents: Tripotassium phosphate

Catalysts: Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, Di- μ -chlorobis[(1,2,5,6- η)-1,5-cyclooctadiene]dirhodium, X-Phos

Solvents: Methanol, 2-Methyl-2-butanol; 16 h, 110 °C

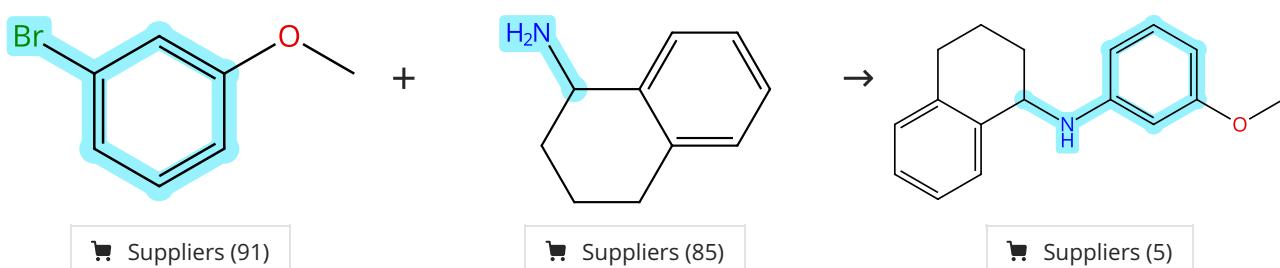
Experimental Protocols

Multicomponent multicatalyst reactions (MC)²R: One-pot synthesis of 3,4-dihydroquinolinones

By: Zhang, Lei; et al

Organic Letters (2013), 15(9), 2128-2131.

Scheme 367 (1 Reaction)



31-172-CAS-7541359

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; rt → 100 °C; 16 h, 100 °C

Experimental Protocols

Direct Measurement of the Thermodynamics of Vinylarene Hydroamination

By: Johns, Adam M.; et al

Journal of the American Chemical Society (2006), 128(29), 9306-9307.

Scheme 368 (1 Reaction)



31-172-CAS-65547

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, Tri-*tert*-butylphosphine

Solvents: Toluene; 2 h, 110 °C

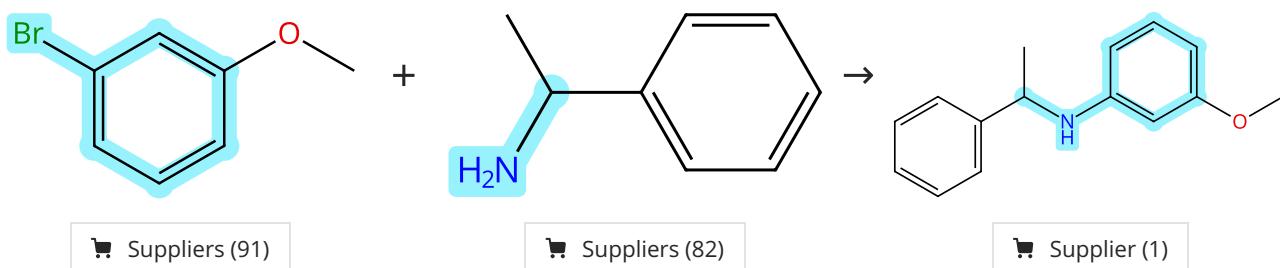
Experimental Protocols

Regioselective [5,5]-Sigmatropic Rearrangement Reactions of Aryl Hydrazides

By: Kang, Hong-Min; et al

Organic Letters (2006), 8(10), 2047-2050.

Scheme 369 (1 Reaction)



31-172-CAS-9062558

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; rt → 100 °C; 16 h, 100 °C

Experimental Protocols

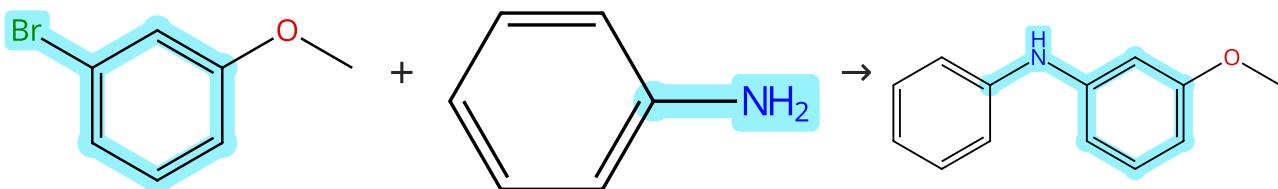
Direct Measurement of the Thermodynamics of Vinylarene Hydroamination

By: Johns, Adam M.; et al

Journal of the American Chemical Society (2006), 128(29), 9306-9307.

Scheme 370 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (91)

Suppliers (100)

Suppliers (72)

31-172-CAS-12994540

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

Experimental Protocols

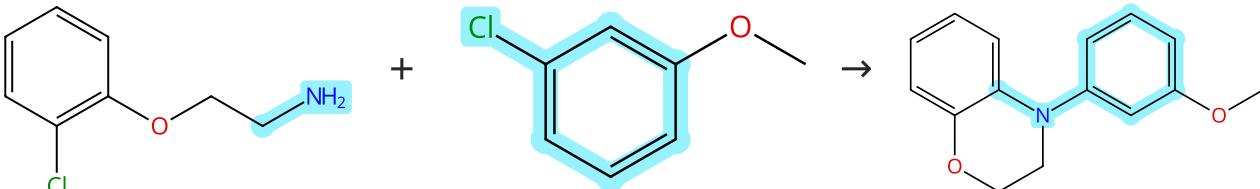
P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 371 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (66)

Suppliers (82)

Suppliers (3)

31-172-CAS-14399051

Steps: 1 Yield: 96%

1.1 Reagents: *tert*-Butanol, Sodium hydrideCatalysts: Palladium diacetate, 1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene

Solvents: 1,4-Dioxane; 15 min, 100 °C

1.2 Solvents: 1,4-Dioxane; 4 h, 100 °C

1.3 Solvents: 1,4-Dioxane; 6 h, 100 °C; 100 °C → rt

Experimental Protocols

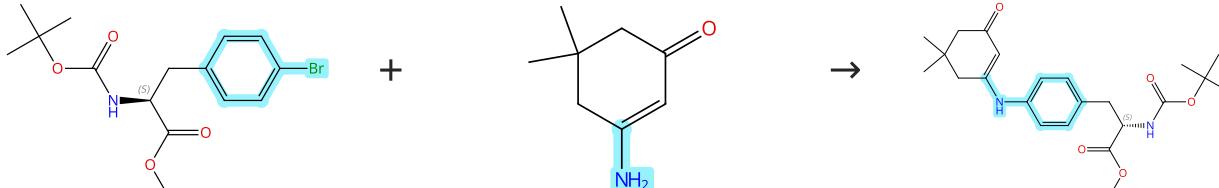
Novel synthetic strategy of N-arylated heterocycles via sequential palladium-catalyzed intra- and inter-arylation reactions

By: Omar-Amrani, Rafik; et al

Synthesis (2004), (15), 2527-2534.

Scheme 372 (1 Reaction)

Steps: 1 Yield: 96%

Absolute stereochemistry shown,
Rotation (+)

Suppliers (67)

Suppliers (47)

Absolute stereochemistry shown

31-172-CAS-3682002

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

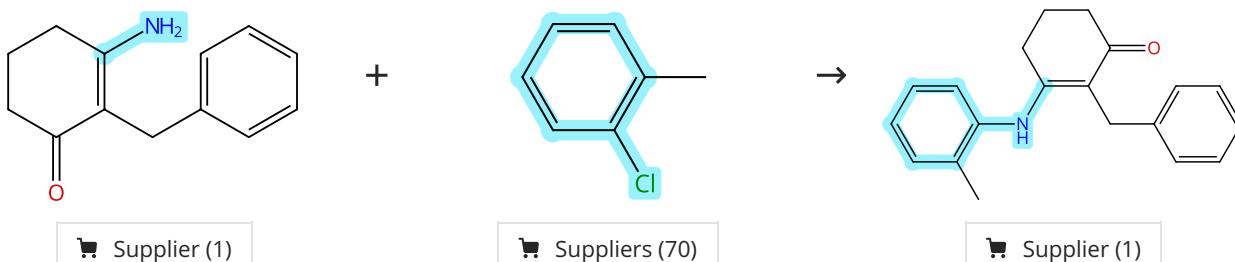
Experimental Protocols

Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 373 (1 Reaction)



31-172-CAS-11825899

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine

Solvents: Tetrahydrofuran

Experimental Protocols

Palladium-catalyzed coupling of vinylogous amides with aryl halides: applications to the synthesis of heterocycles

By: Edmondson, Scott D.; et al

Organic Letters (2000), 2(8), 1109-1112.

Scheme 374 (1 Reaction)



31-172-CAS-11146068

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Palladium diacetate, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 9 - 15 h, 80 °C

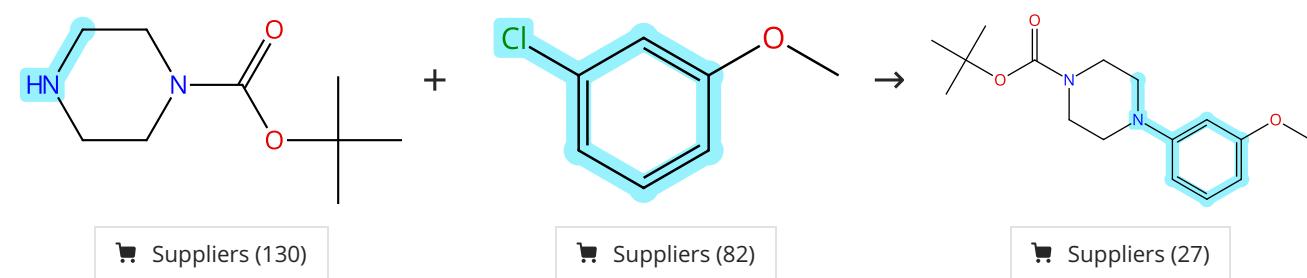
Experimental Protocols

P(i-BuNCH₂CH₂)₃N: an effective ligand in the palladium-catalyzed amination of aryl bromides and iodides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2003), 68(2), 452-459.

Scheme 375 (1 Reaction)



31-172-CAS-1862168

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 24 h, 100 °C; 100 °C → rt

Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

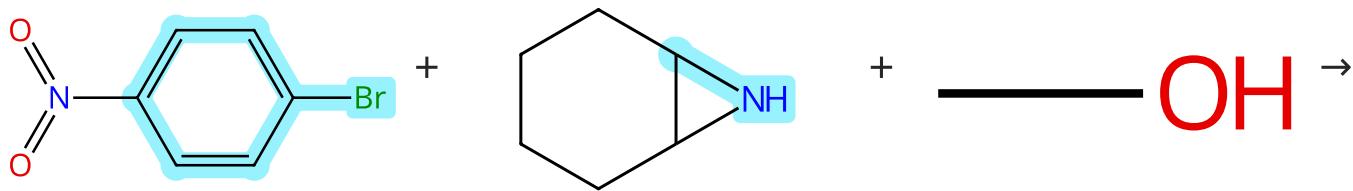
By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Experimental Protocols

Scheme 376 (1 Reaction)

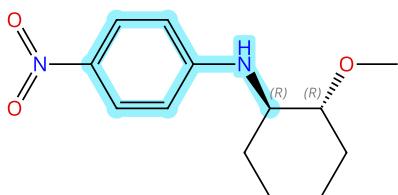
Steps: 1 Yield: 96%



Suppliers (84)

Suppliers (37)

Suppliers (471)



Relative stereochemistry shown

Supplier (1)

31-172-CAS-7188100

Steps: 1 Yield: 96%

N-Arylation of aziridines

By: Sasaki, Mikio; et al

Journal of Organic Chemistry (2003), 68(5), 2045-2047.

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP

Solvents: Toluene; 3 h, 70 °C

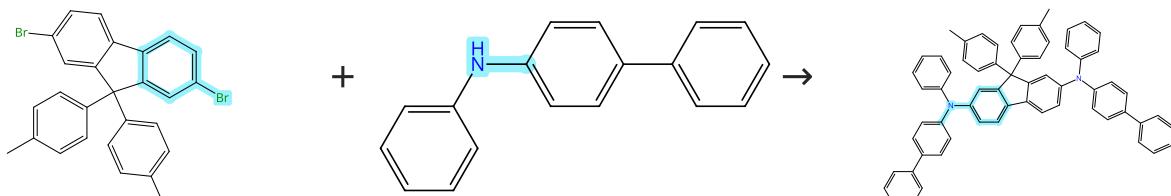
1.2 Catalysts: Tetrafluoroboric acid

Solvents: Methanol; rt

Experimental Protocols

Scheme 377 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (24)

Suppliers (76)

31-172-CAS-120230

Steps: 1 Yield: 96%

Synthesis and properties of 9,9-diarylfluorene-based triaryl iamines

By: Wong, Ken-Tsung; et al

Organic Letters (2001), 3(15), 2285-2288.

1.1 Reagents: Potassium *tert*-butoxide1.2 Reagents: Tri-*tert*-butylphosphine

Catalysts: Palladium diacetate

Solvents: Toluene

1.3 Solvents: Water

1.4 Solvents: Ethyl acetate

Experimental Protocols

Scheme 378 (1 Reaction)



Suppliers (4)

Suppliers (88)

Suppliers (2)

31-172-CAS-11970759

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9-H-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: Toluene; 10 min, rt; 24 h, 140 °C

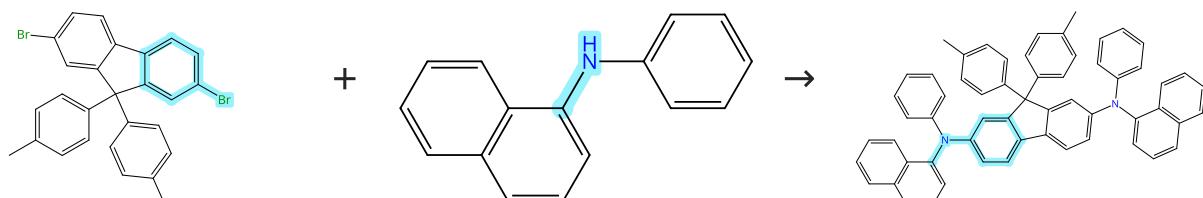
Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Experimental Protocols

Scheme 379 (1 Reaction)



Suppliers (24)

Suppliers (91)

31-172-CAS-14136276

Steps: 1 Yield: 96%

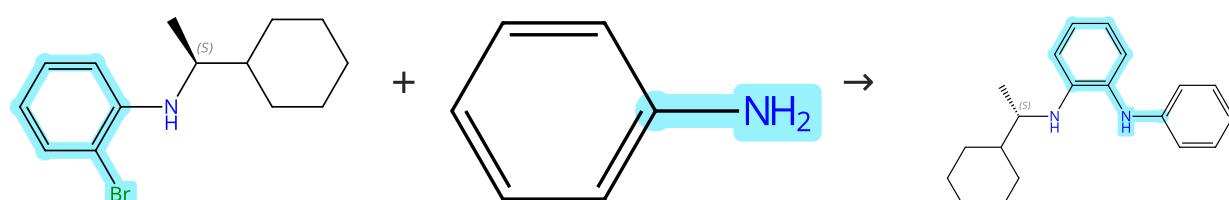
Synthesis and properties of 9,9-diarylfluorene-based triaryldiamines

By: Wong, Ken-Tsung; et al

Organic Letters (2001), 3(15), 2285-2288.

Experimental Protocols

Scheme 380 (1 Reaction)



Absolute stereochemistry shown

Suppliers (3)

Suppliers (100)

Absolute stereochemistry shown

31-172-CAS-3241947

Steps: 1 Yield: 96%

A Versatile Synthesis of Substituted Benzimidazolium Salts by an Amination/Ring Closure Sequence

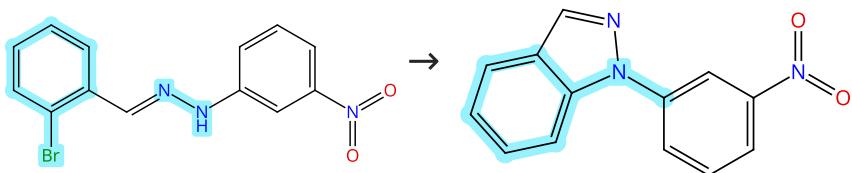
By: Rivas, Felix M.; et al

Organic Letters (2001), 3(17), 2673-2676.

Experimental Protocols

Scheme 381 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (5)

Suppliers (19)

31-172-CAS-13940223

Steps: 1 Yield: 96%

1.1 Reagents: Tripotassium phosphate, Bis[2-(diphenylphosphino)phenyl] ether

Catalysts: Bis(dibenzylideneacetone)palladium

Solvents: Toluene; 12 h, 110 °C; 110 °C → rt

Synthesis of 1-aryl-1H-indazoles via palladium-catalyzed intramolecular amination of aryl halides

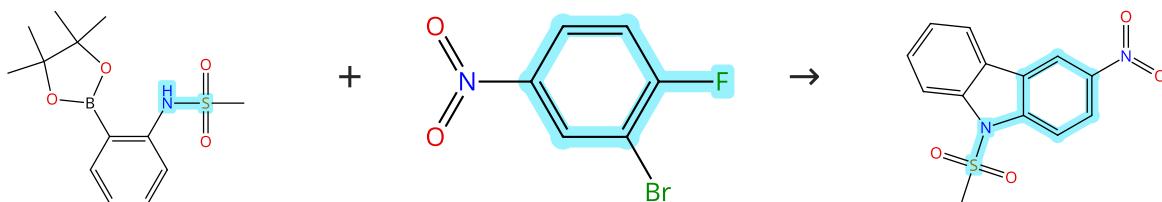
By: Lebedev, Artyom Y.; et al

Journal of Organic Chemistry (2005), 70(2), 596-602.

Experimental Protocols

Scheme 382 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (70)

Suppliers (93)

Supplier (1)

31-172-CAS-11225634

Steps: 1 Yield: 96%

A Tandem Cross-Coupling/S_NAr Approach to Functionalized Carbazoles

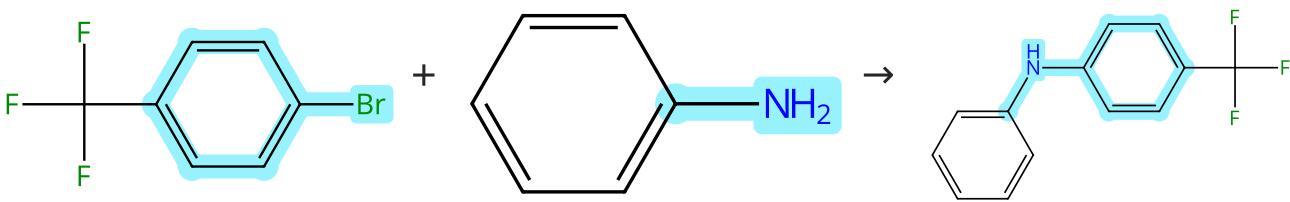
By: St. Jean, David J. Jr.; et al

Organic Letters (2007), 9(23), 4893-4896.

Experimental Protocols

Scheme 383 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (90)

Suppliers (100)

Suppliers (10)

31-172-CAS-7184819

Steps: 1 Yield: 96%

Bulky Alkylphosphines with Neopentyl Substituents as Ligands in the Amination of Aryl Bromides and Chlorides

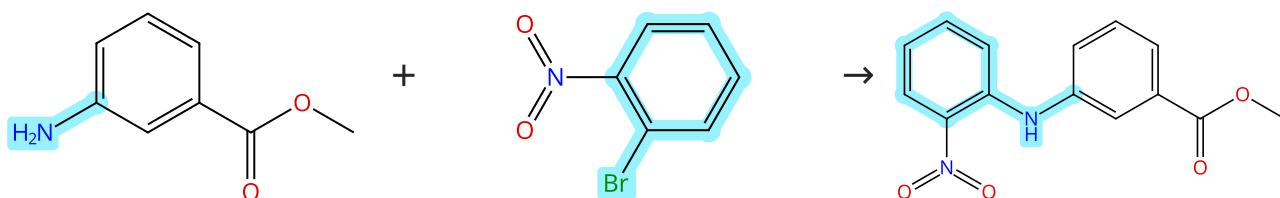
By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2006), 71(14), 5117-5125.

Experimental Protocols

Scheme 384 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (106)

Suppliers (72)

Supplier (1)

31-172-CAS-3827518

Steps: 1 Yield: 96%

1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, Bis[2-(diphenylphosphino)phenyl] ether
Solvents: Toluene; 16 h, 75 °C

Synthesis of novel N-heterocyclic carbene-oxazoline palladium complexes and their applications in Suzuki-Miyaura cross-coupling reaction

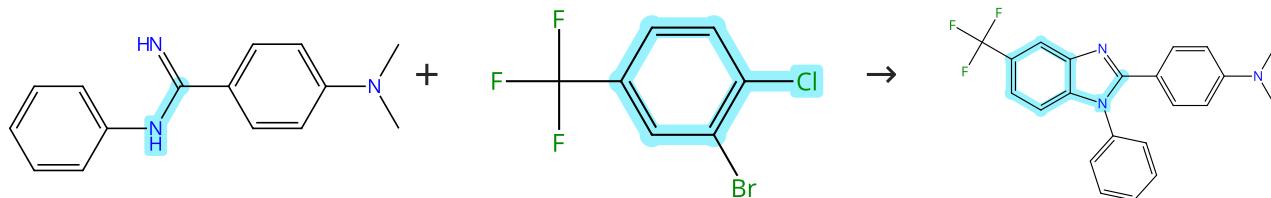
By: Gu, Peng; et al

Synlett (2013), 24(10), 1255-1259.

Experimental Protocols

Scheme 385 (1 Reaction)

Steps: 1 Yield: 96%



Supplier (1)

Suppliers (78)

31-172-CAS-2523011

Steps: 1 Yield: 96%

1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9H-xanthene-4,5-diy)bis[1,1-diphenylphosphine]
Solvents: Toluene; 10 min, rt; 24 h, 140 °C

Regiospecific Synthesis of 1,2-Disubstituted (Hetero)aryl Fused Imidazoles with Tunable Fluorescent Emission

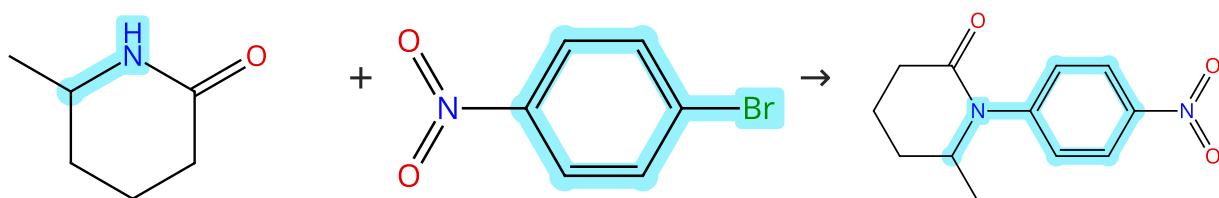
By: Zhao, Dongbing; et al

Organic Letters (2011), 13(24), 6516-6519.

Experimental Protocols

Scheme 386 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (67)

Suppliers (84)

Supplier (1)

31-172-CAS-1761859

Steps: 1 Yield: 96%

Synthesis of Tricyclic Nitrogen Heterocycles by a Sequence of Palladium-Catalyzed N-H and C(sp³)-H Arylations

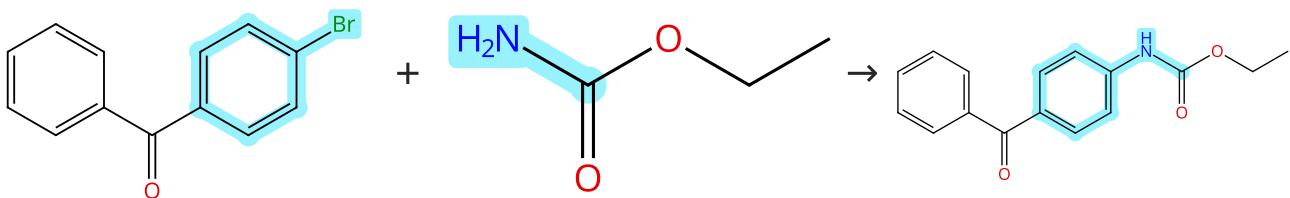
By: Guyonnet, Mathieu; et al

Organic Letters (2012), 14(1), 398-401.

Experimental Protocols

Scheme 387 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (86)

Suppliers (93)

Suppliers (5)

31-172-CAS-9030282

Steps: 1 Yield: 96%

1.1 Reagents: Potassium *tert*-butoxide, Sodium *tert*-butoxide, Poly(oxy-1,2-ethanediyl), α -[4-[3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)-2*H*-1-benzopyran-6-yl]oxy]-1,4-dioxobutyl]- ω -methoxy-

Catalysts: Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, Bis(1,1-dimethylethyl)(1-methyl-2,2-diphenylcyclopropyl)phosphine

Solvents: Water; 24 h, rt

"Nok": A Phytosterol-Based Amphiphile Enabling Transition-Metal-Catalyzed Couplings in Water at Room Temperature

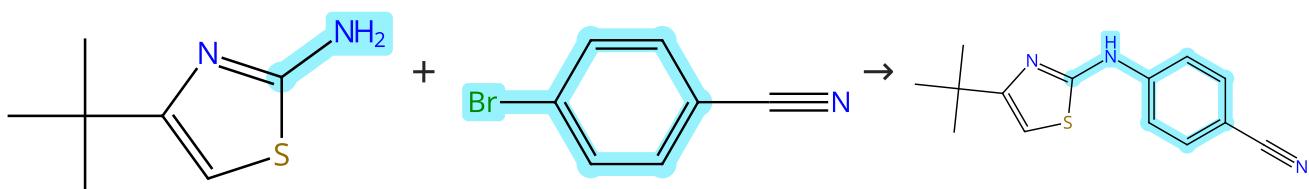
By: Klumphu, Piyatida; et al

Journal of Organic Chemistry (2014), 79(3), 888-900.

Experimental Protocols

Scheme 388 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (81)

Suppliers (105)

Suppliers (6)

31-172-CAS-12256334

Steps: 1 Yield: 96%

Palladium-catalyzed N-arylation of 2-aminothiazoles

1.1 Catalysts: Water, Tris(dibenzylideneacetone)dipalladium, [3,6-Dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]bis(1,1-dimethylethyl)phosphine

Solvents: *tert*-Butanol; 2.5 min, 110 °C

By: McGowan, Meredith A.; et al

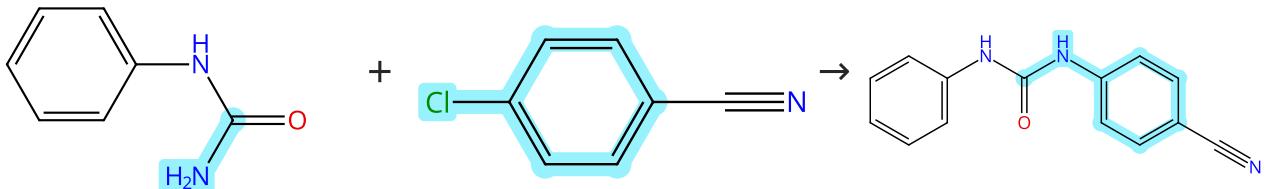
Organic Letters (2012), 14(6), 1432-1435.

1.2 Reagents: Potassium carbonate
Solvents: *tert*-Butanol; 16 h, 90 °C

Experimental Protocols

Scheme 389 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (85)

Suppliers (102)

Suppliers (33)

31-172-CAS-1368850

Steps: 1 Yield: 96%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 5-[Bis(1,1-dimethylethyl)phosphino]-1',3',5'-triphenyl-1,4'-bi-1*H*-pyrazole

Solvents: 1,2-Dimethoxyethane; 1 h, rt

1.2 rt; rt → 85 °C; 1 h, 85 °C; 85 °C → rt

1.3 Solvents: Dimethylformamide; 30 min, rt

Experimental Protocols

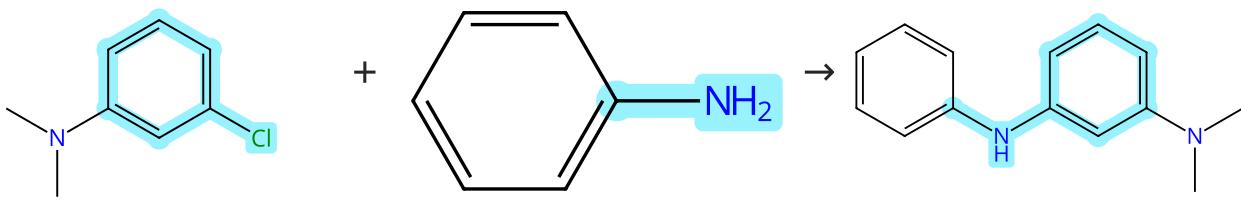
A General Method for the Synthesis of Unsymmetrically Substituted Ureas via Palladium-Catalyzed Amidation

By: Kotecki, Brian J.; et al

Organic Letters (2009), 11(4), 947-950.

Scheme 390 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (61)

Suppliers (100)

Suppliers (6)

31-172-CAS-6797498

Steps: 1 Yield: 96%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^{β})palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

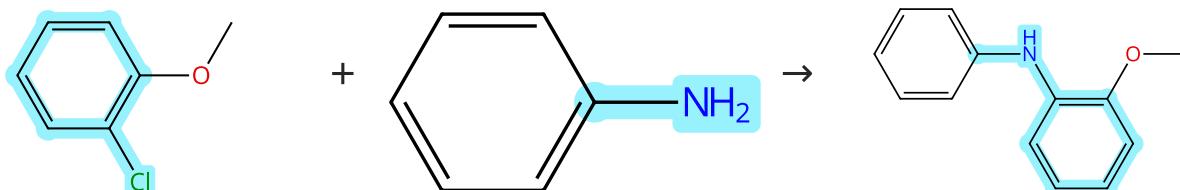
By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

Scheme 391 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (66)

Suppliers (100)

Suppliers (16)

31-172-CAS-958585

Steps: 1 Yield: 96%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: [Bis(1,1-dimethylethyl)(2,2-dimethylpropyl)phosphine]chloro(*n*³-2-propen-1-yl)palladium

Solvents: Toluene; 3 - 6 h, 100 °C

Synthesis and X-ray Structure Determination of Highly Active Pd(II), Pd(I), and Pd(0) Complexes of Di(*tert*-butyl)neopentylphosphine (DTBNpP) in the Arylation of Amines and Ketones

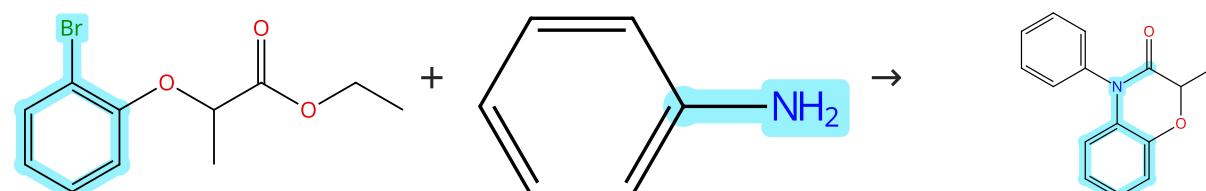
By: Hill, Lensey L.; et al

Journal of Organic Chemistry (2010), 75(19), 6477-6488.

Experimental Protocols

Scheme 392 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (35)

Suppliers (100)

Suppliers (3)

31-172-CAS-6349252

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 24 h, 90 °C

Experimental Protocols

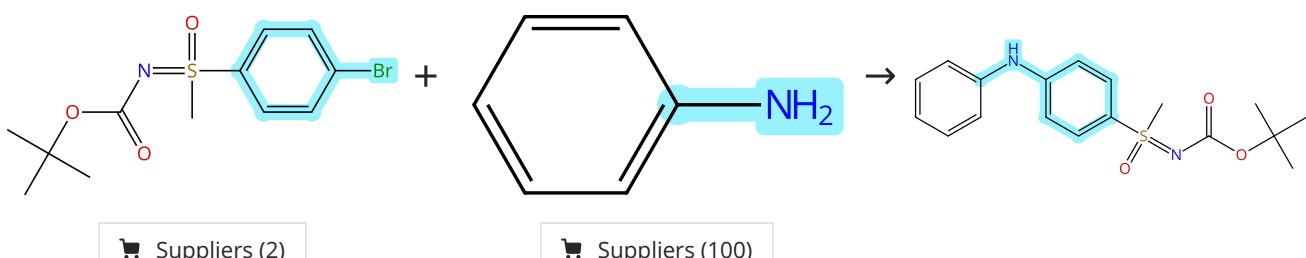
A Pd-catalyzed cascade protocol towards 2-alkyl-4-aryl-4H-benz[1,4]oxazin-3-ones from aryl amines and 2-(2-halophenoxy)alkanoates

By: Feng, Gaofeng; et al

Synlett (2012), 23(4), 601-606.

Scheme 393 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (2)

Suppliers (100)

31-172-CAS-6546825

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; rt → reflux; reflux; reflux → rt

1.2 Reagents: Hydrochloric acid
Solvents: Ethyl acetate, Water; rt

Experimental Protocols

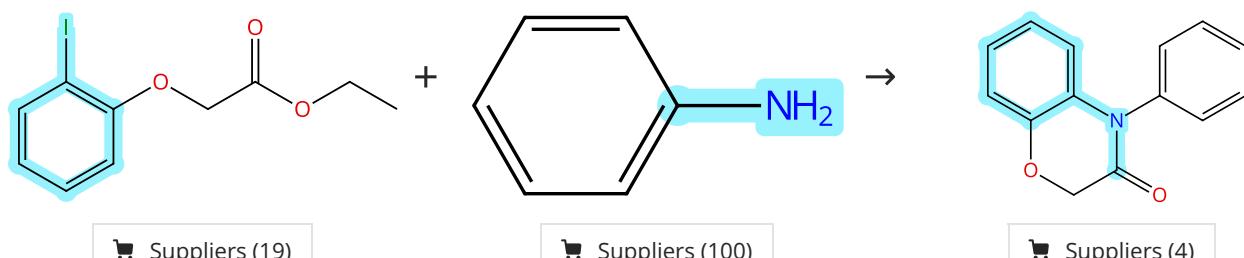
Synthesis and palladium-catalyzed coupling reactions of enantiopure p-bromophenyl methyl sulfoximine

By: Cho, Gae Young; et al

Journal of Organic Chemistry (2005), 70(6), 2346-2349.

Scheme 394 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (19)

Suppliers (100)

Suppliers (4)

31-172-CAS-335520

Steps: 1 Yield: 96%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, BINAP
Solvents: Toluene; 24 h, 90 °C

Experimental Protocols

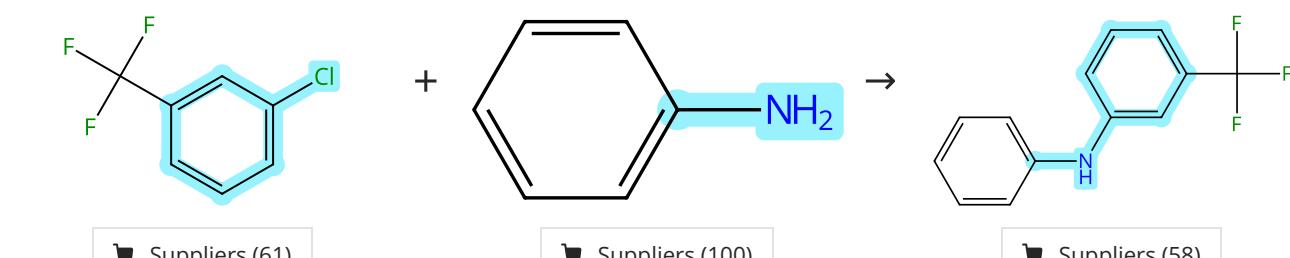
A Pd-catalyzed cascade protocol towards 2-alkyl-4-aryl-4H-benz[1,4]oxazin-3-ones from aryl amines and 2-(2-halophenoxy)alkanoates

By: Feng, Gaofeng; et al

Synlett (2012), 23(4), 601-606.

Scheme 395 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (61)

Suppliers (100)

Suppliers (58)

31-172-CAS-2850006

Steps: 1 Yield: 96%

1.1 Reagents: Potassium hydroxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, X-Phos

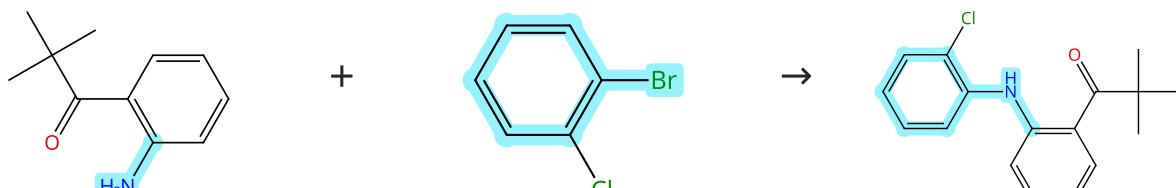
Solvents: Water; 3 h, 110 °C

Experimental Protocols

Expanding Pd-Catalyzed C-N Bond-Forming Processes: The First Amidation of Aryl Sulfonates, Aqueous Amination, and Complementarity with Cu-Catalyzed Reactions

By: Huang, Xiaohua; et al

Journal of the American Chemical Society (2003), 125(22), 6653-6655.

Scheme 396 (1 Reaction)

Suppliers (9)

Suppliers (94)

Supplier (1)

Steps: 1 Yield: 96%

31-172-CAS-9713714

Steps: 1 Yield: 96%

1.1 Reagents: Potassium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, Dicyclohexyl[3,6-dimethoxy-2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine

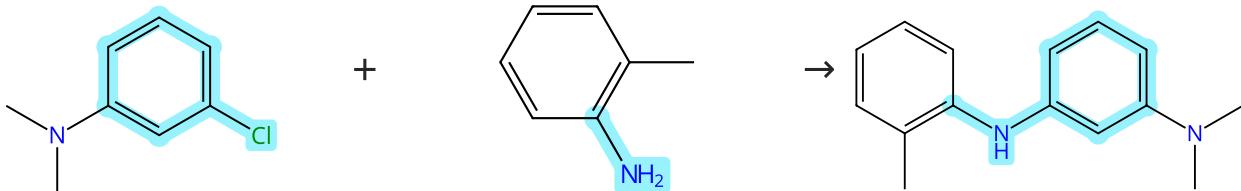
Solvents: *tert*-Butanol; 5 h, 100 °C

Experimental Protocols

Concise Palladium-Catalyzed Synthesis of Dibenzodiazepines and Structural Analogues

By: Tsvelikhovsky, Dmitry; et al

Journal of the American Chemical Society (2011), 133(36), 14228-14231.

Scheme 397 (1 Reaction)

Suppliers (61)

Suppliers (83)

Steps: 1 Yield: 96%

31-172-CAS-14597389

Steps: 1 Yield: 96%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

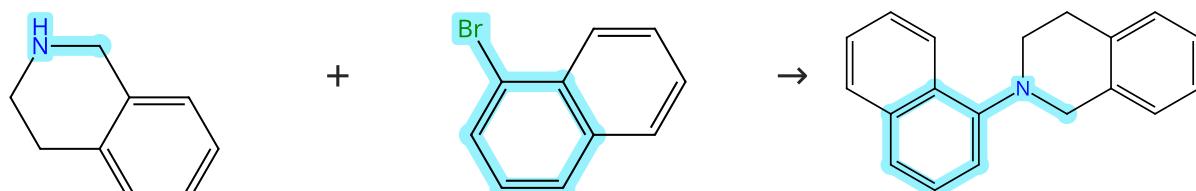
Solvents: 1,4-Dioxane; 1 h, 90 °C

Experimental Protocols

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 398 (1 Reaction)

Suppliers (102)

Suppliers (97)

Supplier (2)

Steps: 1 Yield: 96%

31-172-CAS-6284802

Steps: 1 Yield: 96%

An aromatic amination approach towards ancistrocladinium A/B

By: Buckley, Benjamin R.; et al

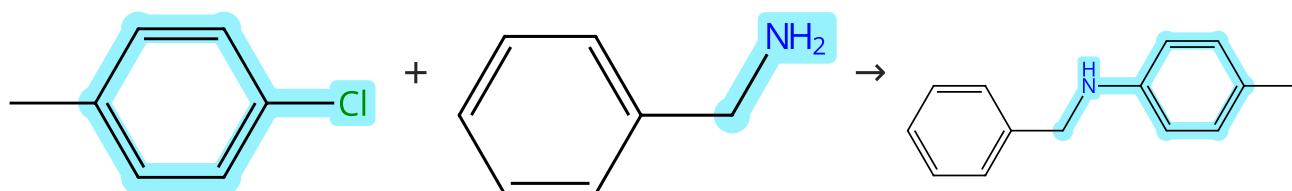
Synlett (2010), (6), 939-943.

- 1.1 **Catalysts:** Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; 15 min, rt → 110 °C; 110 °C → rt
- 1.2 **Reagents:** Sodium *tert*-butoxide; 4 - 18 h, reflux

Experimental Protocols

Scheme 399 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (77)

Suppliers (82)

Suppliers (56)

31-172-CAS-15301598

Steps: 1 Yield: 95%

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

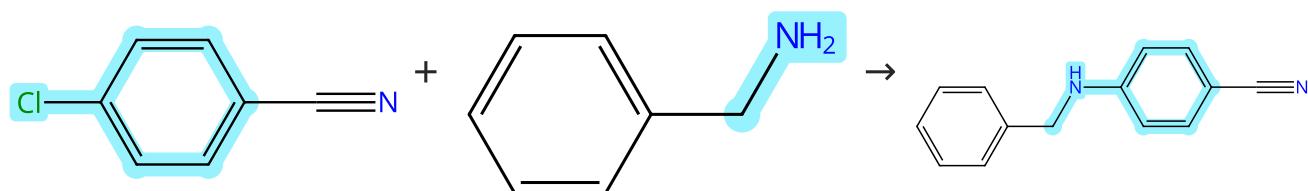
Journal of Organic Chemistry (2002), 67(16), 5553-5566.

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Palladium diacetate, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene
Solvents: Toluene

Experimental Protocols

Scheme 400 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (102)

Suppliers (82)

Suppliers (39)

31-172-CAS-4051151

Steps: 1 Yield: 95%

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

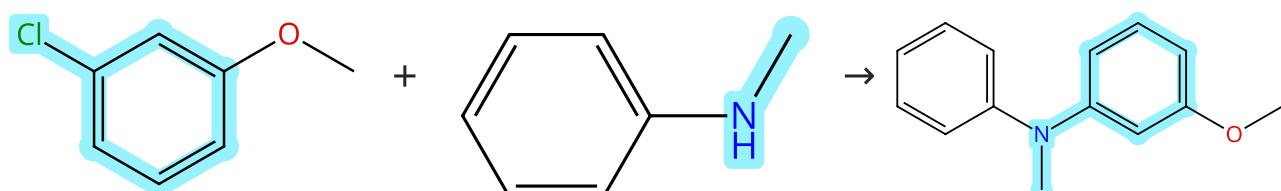
By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Experimental Protocols

Scheme 401 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (82)

Suppliers (75)

Suppliers (8)

31-172-CAS-10120424

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 80 °C

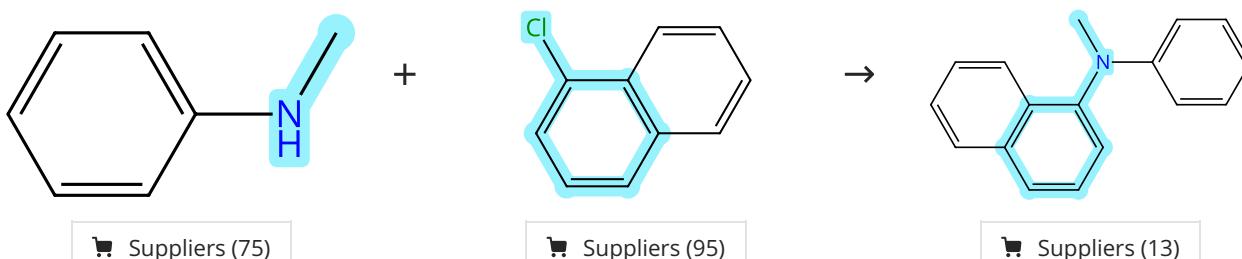
Experimental Protocols

P[N(i-Bu)CH₂CH₂]₃N: A Versatile Ligand for the Pd-Catalyzed Amination of Aryl Chlorides

By: Urgaonkar, Sameer; et al

Organic Letters (2003), 5(6), 815-818.

Scheme 402 (1 Reaction)



31-172-CAS-9963220

Steps: 1 Yield: 95%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: (*S,P*-4-2)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chloro(2,4-pentanedionato-κ^{O²,κ^{O⁴})palladium}

Solvents: 1,2-Dimethoxyethane; 3 h, rt

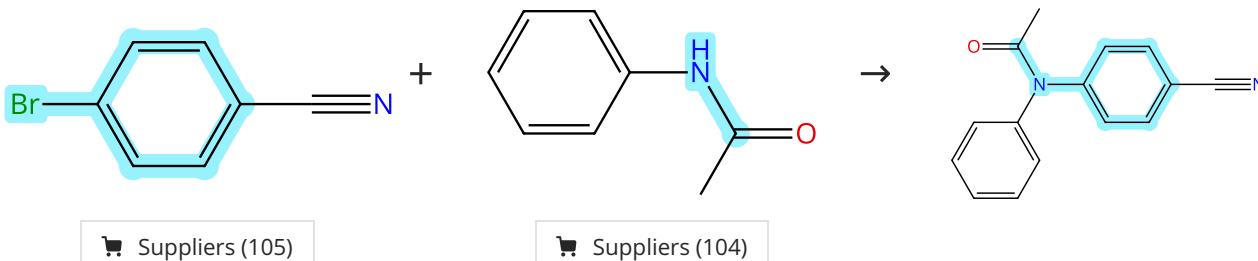
(IPr)Pd(acac)Cl: An Easily Synthesized, Efficient, and Versatile Precatalyst for C-N and C-C Bond Formation

By: Marion, Nicolas; et al

Journal of Organic Chemistry (2006), 71(10), 3816-3821.

Experimental Protocols

Scheme 403 (1 Reaction)



31-172-CAS-14361731

Steps: 1 Yield: 95%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, 1,1'-(9,9-Dimethyl-9*H*-xanthene-4,5-diyl)bis[1,1-diphenylphosphine]

Solvents: 1,4-Dioxane

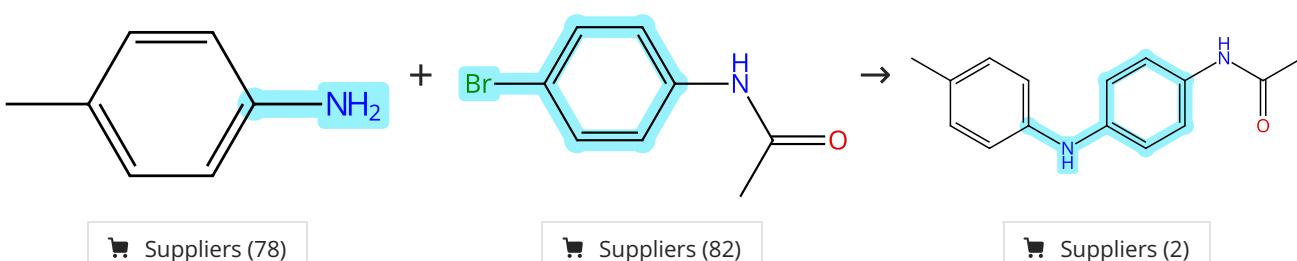
Palladium-catalyzed intermolecular coupling of aryl halides and amides

By: Yin, Jingjun; et al

Organic Letters (2000), 2(8), 1101-1104.

Experimental Protocols

Scheme 404 (1 Reaction)



31-172-CAS-5672926

Steps: 1 Yield: 95%

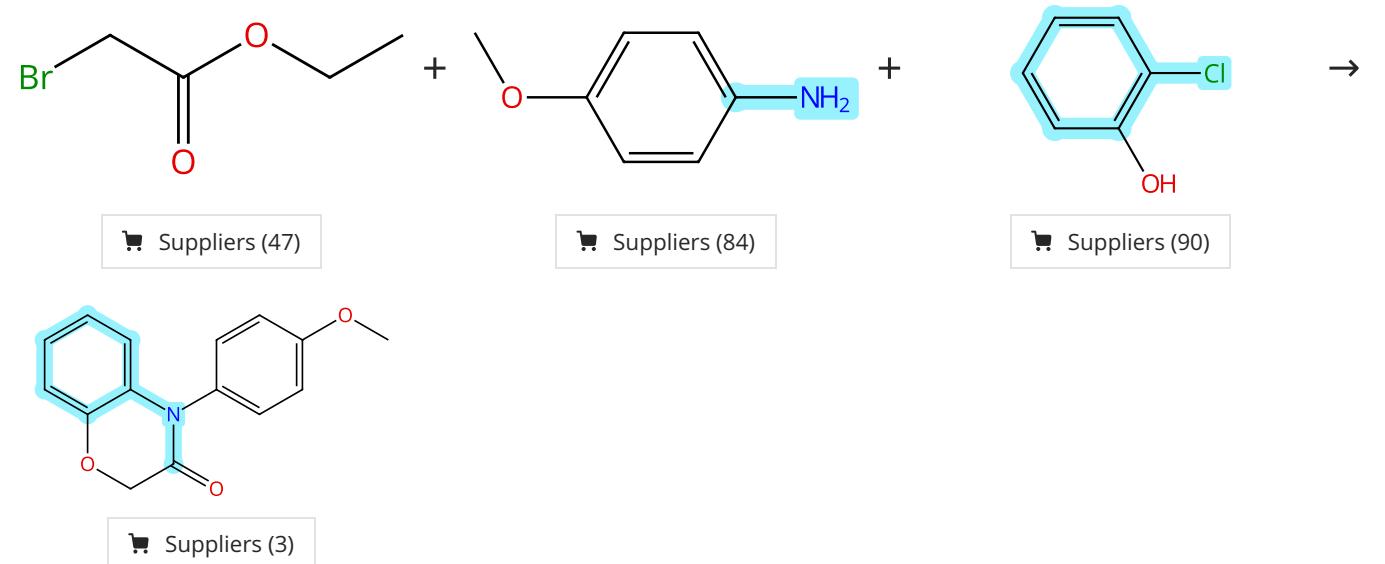
- 1.1 **Reagents:** Lithium bis(trimethylsilyl)amide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2'-(Dicyclohexylphosphino)-*N,N*-dimethyl[1,1'-biphenyl]-2-amine
Solvents: Tetrahydrofuran
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Water
- 1.3 **Reagents:** Sodium bicarbonate
Solvents: Water

Experimental Protocols

Improved Functional Group Compatibility in the Palladium-Catalyzed Synthesis of Aryl Amines

By: Harris, Michele C.; et al

Organic Letters (2002), 4(17), 2885-2888.

Scheme 405 (1 Reaction)

31-008-CAS-1042745

Steps: 1 Yield: 95%

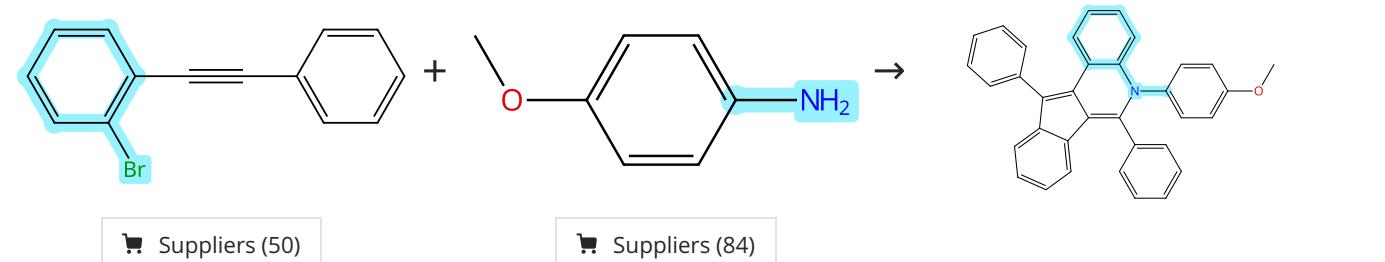
- 1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, X-Phos
Solvents: Toluene; 3 h, 150 °C

Experimental Protocols

Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2H-1,4-benzoxazines: an improved catalytic system and multicomponent process

By: Feng, Gaofeng; et al

Synthesis (2013), 45(19), 2711-2718.

Scheme 406 (1 Reaction)

31-172-CAS-13785204

Steps: 1 Yield: 95%

- 1.1 **Reagents:** Sodium *tert*-butoxide
Catalysts: Tricyclohexylphosphine, Palladium diacetate
Solvents: 1,4-Dioxane; reflux

Experimental Protocols

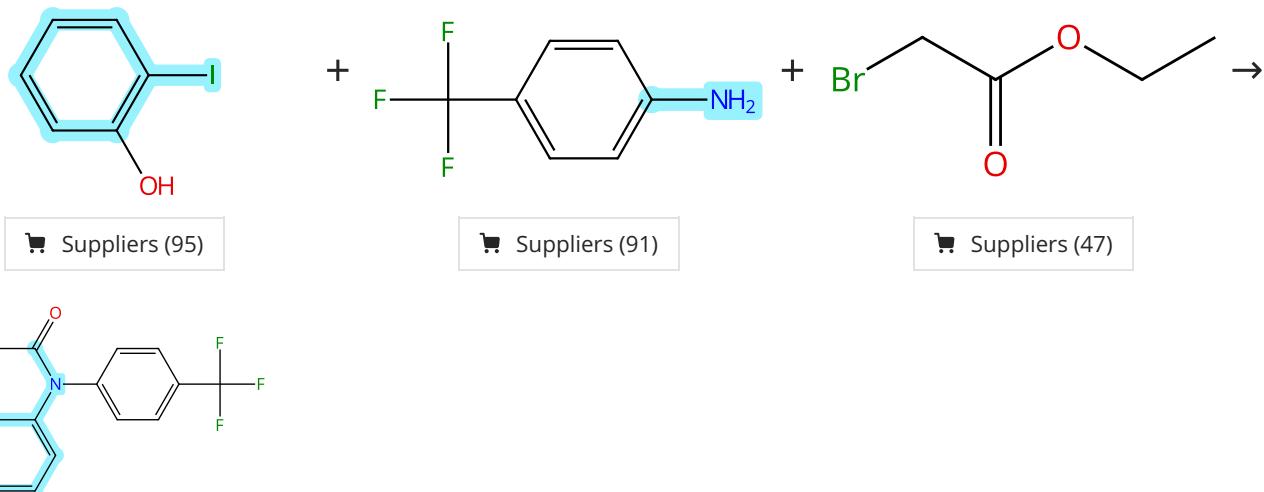
Efficient Synthesis of 5H-Cyclopenta[c]quinoline Derivatives via Palladium-Catalyzed Domino Reactions of o-Alkynylhobenzene with Amine

By: Luo, Yong; et al

Organic Letters (2011), 13(5), 1150-1153.

Scheme 407 (1 Reaction)

Steps: 1 Yield: 95%



31-008-CAS-559460

Steps: 1 Yield: 95%

1.1 **Reagents:** Cesium carbonate
Catalysts: Palladium diacetate, X-Phos
Solvents: Toluene; 3 h, 150 °C

Experimental Protocols

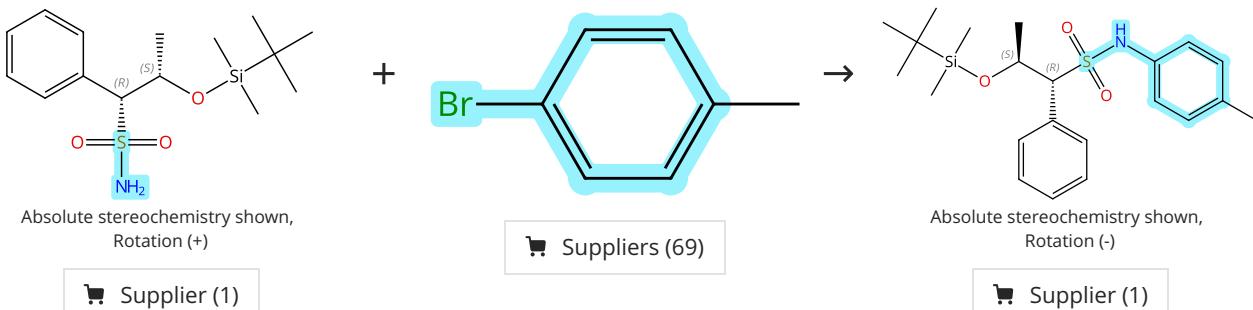
Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2H-1,4-benzodiazepines: an improved catalytic system and multicomponent process

By: Feng, Gaofeng; et al

Synthesis (2013), 45(19), 2711-2718.

Scheme 408 (1 Reaction)

Steps: 1 Yield: 95%



31-172-CAS-1612907

Steps: 1 Yield: 95%

1.1 **Reagents:** Potassium carbonate
Catalysts: Di- μ -chlorobis(η^3 -2-propenyl)dipalladium, Bis(1,1-dimethylethyl)[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine
Solvents: 2-Methyltetrahydrofuran; 17 h, 80 °C

Experimental Protocols

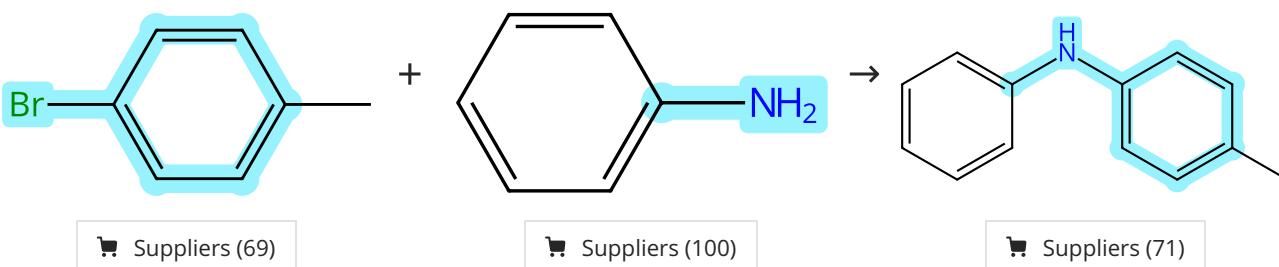
Convenient Route to Secondary Sulfinate: Application to the Stereospecific Synthesis of α -C-Chiral Sulfonamides

By: Johnson, Michael G.; et al

Organic Letters (2014), 16(23), 6248-6251.

Scheme 409 (1 Reaction)

Steps: 1 Yield: 95%



31-172-CAS-9701485

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Palladium
Solvents: Toluene; 8 h, 110 °C

Experimental Protocols

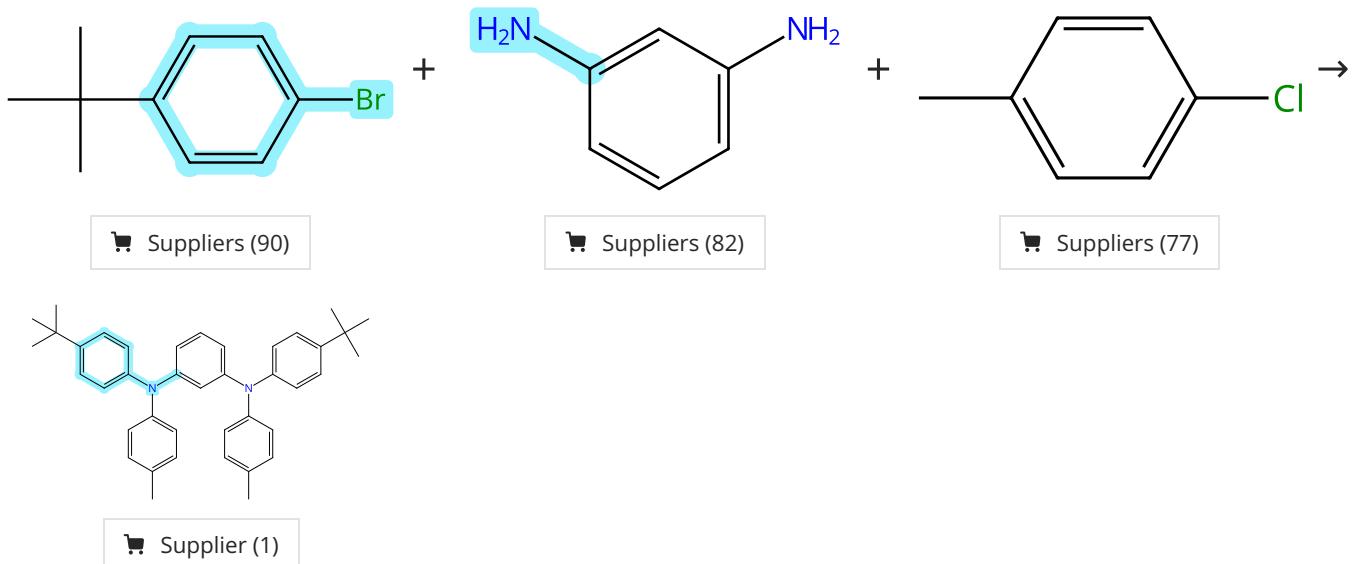
Polymer-incarcerated palladium with active phosphine as recoverable and reusable Pd catalyst for the amination of aryl chlorides

By: Inasaki, Takeshi; et al

Synlett (2007), (20), 3209-3213.

Scheme 410 (2 Reactions)

Steps: 1 Yield: 95%



31-172-CAS-9338329

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene

Experimental Protocols

One-Pot Synthesis of Unsymmetrical Triarylamines from Aniline Precursors

By: Harris, Michele C.; et al

Journal of Organic Chemistry (2000), 65(17), 5327-5333.

31-172-CAS-3645780

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: Toluene

Experimental Protocols

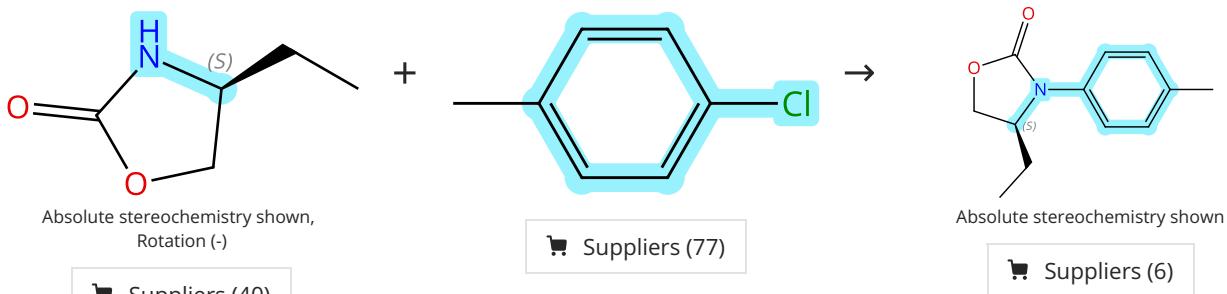
One-pot synthesis of unsymmetrical triarylamines from aniline precursors

By: Harris, Michele C.; et al

Journal of Organic Chemistry (2000), 65(17), 5327-5333.

Scheme 411 (1 Reaction)

Steps: 1 Yield: 95%



31-172-CAS-3598942

Steps: 1 Yield: 95%

1.1 Reagents: Cesium carbonate

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2-(Di-*tert*-butylphosphino)biphenyl

Solvents: Toluene; 15 h, 115 °C

Experimental Protocols

Palladium-Catalyzed Synthesis of N-Aryloxazolidinones from Aryl Chlorides

By: Ghosh, Arun; et al

Organic Letters (2003), 5(13), 2207-2210.

Scheme 412 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (130)

Suppliers (77)

Suppliers (47)

31-172-CAS-4330286

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 24 h, 100 °C; 100 °C → rt

Experimental Protocols

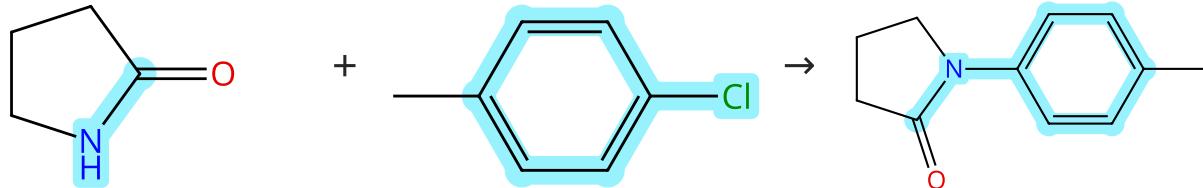
Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Scheme 413 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (76)

Suppliers (77)

Suppliers (39)

31-172-CAS-9970406

Steps: 1 Yield: 95%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphineSolvents: *tert*-Butanol; 12 h, 110 °C

Experimental Protocols

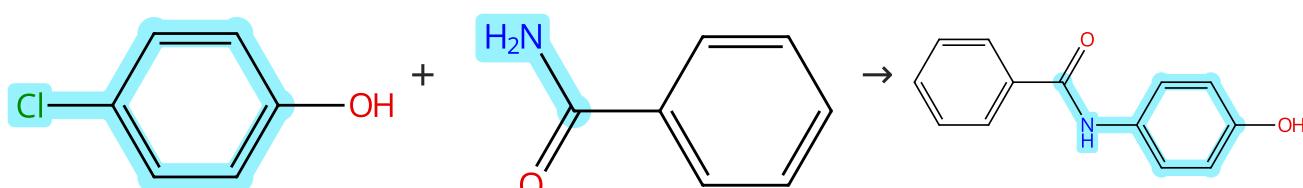
Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation

By: Ikawa, Takashi; et al

Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Scheme 414 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (95)

Suppliers (109)

Suppliers (53)

31-172-CAS-5547979

Steps: 1 Yield: 95%

1.1 Reagents: Tripotassium phosphate

Catalysts: Tris(dibenzylideneacetone)dipalladium, Di-*tert*-butyl(2',4',6'-triisopropyl-3,4,5,6-tetramethylbiphenyl-2-yl)phosphineSolvents: *tert*-Butanol; 24 h, 110 °C

Experimental Protocols

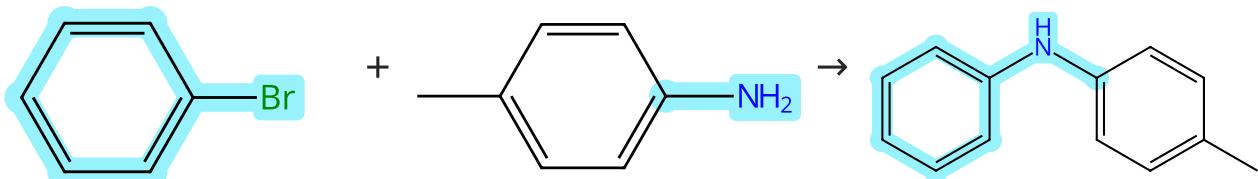
Pd-Catalyzed Amidations of Aryl Chlorides Using Monodentate Biaryl Phosphine Ligands: A Kinetic, Computational, and Synthetic Investigation

By: Ikawa, Takashi; et al

Journal of the American Chemical Society (2007), 129(43), 13001-13007.

Scheme 415 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (74)

Suppliers (78)

Suppliers (71)

31-172-CAS-13579600

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Palladium diacetate, (2*S*)-1-[(1*R*)-1-[Bis(1,1-dimethyl ethyl)phosphino]ethyl]-2-(dicyclohexylphosphino)ferrocene

Solvents: 1,2-Dimethoxyethane; 20 h, 110 °C

Experimental Protocols

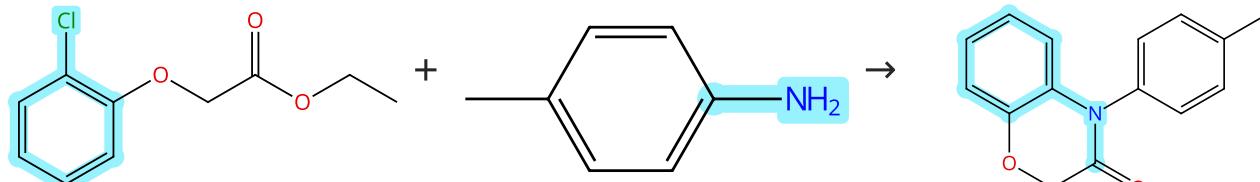
Highly Reactive, General and Long-Lived Catalysts for Palladium-Catalyzed Amination of Heteroaryl and Aryl Chlorides, Bromides, and Iodides: Scope and Structure-Activity Relationships

By: Shen, Qilong; et al

Journal of the American Chemical Society (2008), 130(20), 6586-6596.

Scheme 416 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (32)

Suppliers (78)

Suppliers (3)

31-172-CAS-6072283

Steps: 1 Yield: 95%

1.1 Reagents: Cesium carbonate

Catalysts: Palladium diacetate, X-Phos

Solvents: Toluene; 1.5 h, 150 °C

Experimental Protocols

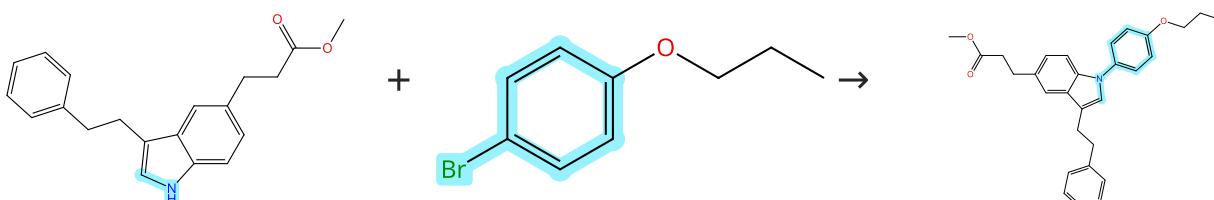
Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2H-1,4-benzoxazines: an improved catalytic system and multicomponent process

By: Feng, Gaofeng; et al

Synthesis (2013), 45(19), 2711-2718.

Scheme 417 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (2)

Suppliers (76)

Supplier (1)

31-172-CAS-413208

Steps: 1 Yield: 95%

1.1 Reagents: Tripotassium phosphate
Catalysts: Palladium diacetate, 2-(Di-*tert*-butylphosphino)biphenyl
Solvents: 1,2-Dimethoxyethane; overnight, 110 °C

Experimental Protocols

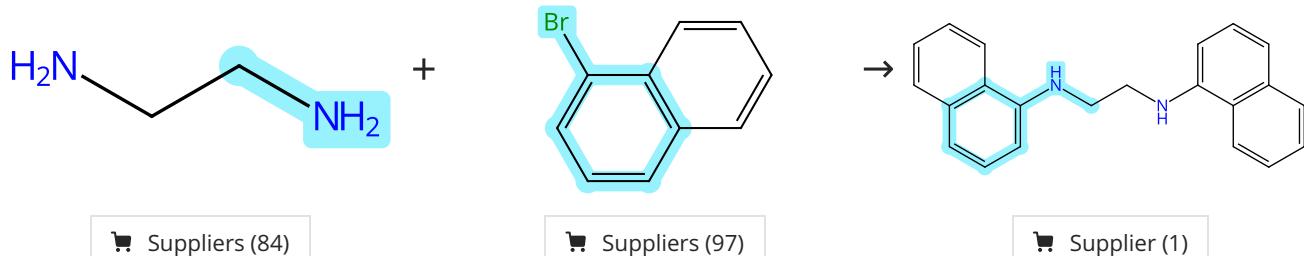
Design, Synthesis, and Biological Evaluation of 3-(1-Aryl-1*H*-indol-5-yl)propanoic Acids as New Indole-Based Cytosolic Phospholipase A_{2α} Inhibitors

By: Tomoo, Toshiyuki; et al

Journal of Medicinal Chemistry (2014), 57(17), 7244-7262.

Scheme 418 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (84)

Suppliers (97)

Supplier (1)

31-172-CAS-6302837

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide
Catalysts: Tris(dibenzylideneacetone)dipalladium, BINAP
Solvents: Toluene; 17 h, 100 °C

Experimental Protocols

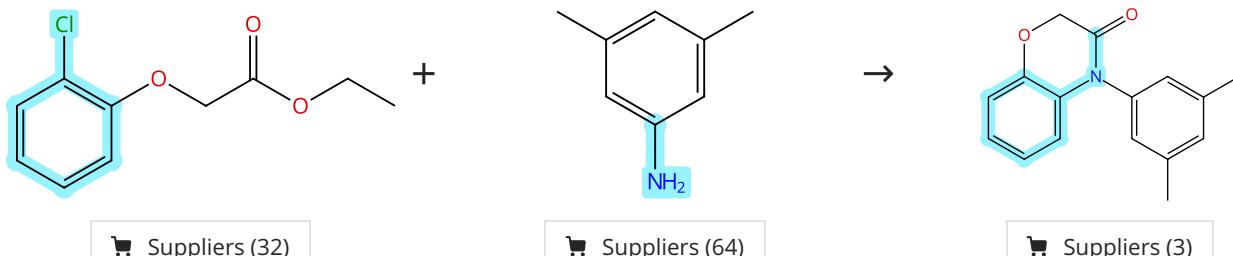
Identification and Characterization of a New Family of Catalytically Highly Active Imidazolin-2-ylidenes

By: Luan, Xinjun; et al

Journal of the American Chemical Society (2008), 130(21), 6848-6858.

Scheme 419 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (32)

Suppliers (64)

Supplier (3)

31-172-CAS-3155996

Steps: 1 Yield: 95%

1.1 Reagents: Cesium carbonate
Catalysts: Palladium diacetate, X-Phos
Solvents: Toluene; 1.5 h, 150 °C

Experimental Protocols

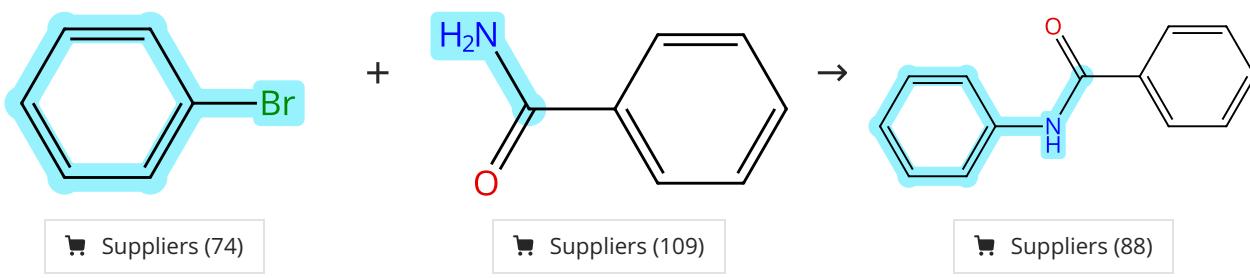
Palladium-catalyzed, microwave-assisted synthesis of 3,4-dihydro-3-oxo-2*H*-1,4-benzoxazines: an improved catalytic system and multicomponent process

By: Feng, Gaofeng; et al

Synthesis (2013), 45(19), 2711-2718.

Scheme 420 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (74)

Suppliers (109)

Suppliers (88)

31-172-CAS-6149513

Steps: 1 Yield: 95%

1.1 Reagents: Cesium carbonate

Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine

Solvents: *tert*-Butanol; 20 h, 100 °C; 100 °C → rt

Palladium-catalyzed amidation of aryl halides using 2-dialkylphosphino-2'-alkoxyl-1,1'-binaphthyl as ligands

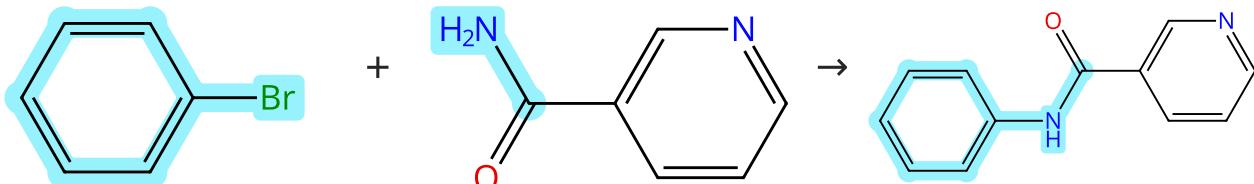
By: Ma, Fangfang; et al

Journal of Organic Chemistry (2012), 77(12), 5279-5285.

Experimental Protocols

Scheme 421 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (74)

Suppliers (150)

Suppliers (61)

31-172-CAS-13352893

Steps: 1 Yield: 95%

1.1 Reagents: Cesium carbonate

Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine

Solvents: *tert*-Butanol; 20 h, 100 °C; 100 °C → rt

Palladium-catalyzed amidation of aryl halides using 2-dialkylphosphino-2'-alkoxyl-1,1'-binaphthyl as ligands

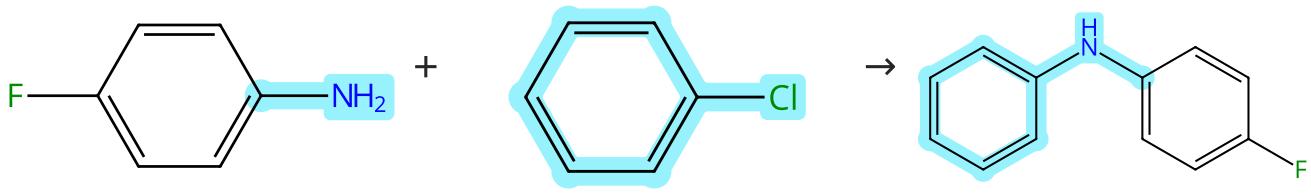
By: Ma, Fangfang; et al

Journal of Organic Chemistry (2012), 77(12), 5279-5285.

Experimental Protocols

Scheme 422 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (73)

Suppliers (136)

Suppliers (59)

31-172-CAS-8594371

Steps: 1 Yield: 95%

1.1 Reagents: Potassium carbonate

Catalysts: (*SP*-4-1-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

Solvents: 1,4-Dioxane; 1 h, 90 °C

N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole

Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

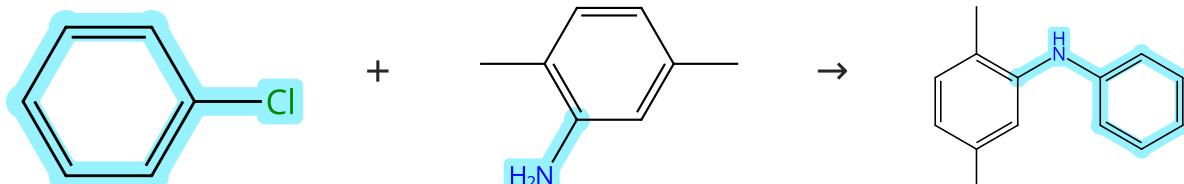
By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Experimental Protocols

Scheme 423 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (136)

Suppliers (72)

Suppliers (20)

31-172-CAS-671273

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: X-Phos, (*SP*-4-4)-[2-[2-(Amino- κ Methyl]phenyl- κ C] chloro[dicyclohexyl[2',4',6'-tris(1-methylethyl)[1,1'-biphenyl]-2-yl]phosphine]palladiumSolvents: 1,4-Dioxane; 10 min, rt \rightarrow 100 °C

Experimental Protocols

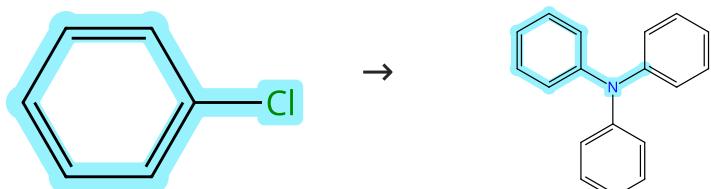
A New Class of Easily Activated Palladium Precatalysts for Facile C-N Cross-Coupling Reactions and the Low Temperature Oxidative Addition of Aryl Chlorides

By: Biscoe, Mark R.; et al

Journal of the American Chemical Society (2008), 130(21), 6686-6687.

Scheme 424 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (136)

Suppliers (98)

31-614-CAS-28736940

Steps: 1 Yield: 95%

1.1 Reagents: Urea, Potassium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, Tri-*tert*-butylphosphonium tetrafluoroborate

Solvents: 1,4-Dioxane; 46 h, 100 °C

One-pot synthesis of symmetrical di- and triarylamines using urea as the source of the amino group

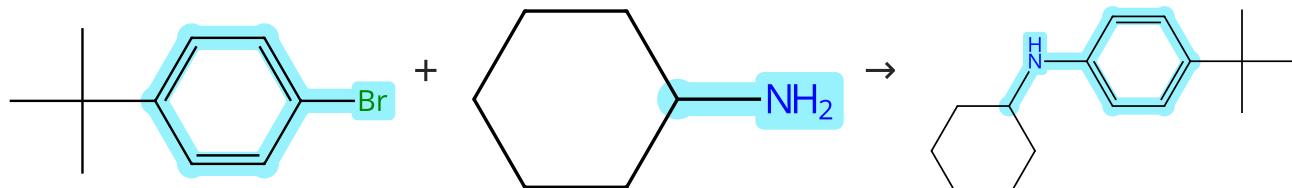
By: Artamkina, Galina A.; et al

Synlett (2006), (2), 235-238.

Experimental Protocols

Scheme 425 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (90)

Suppliers (79)

Suppliers (4)

31-172-CAS-12707130

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxideCatalysts: Tris(dibenzylideneacetone)dipalladium, 1-[2-[Bis(1,1-dimethylethyl)phosphino]phenyl]-3,5-diphenyl-1*H*-pyrazole

Solvents: 2-Methyl-2-butanol; rt

1.2 2 - 16 h, 85 °C; 85 °C \rightarrow rt

1.3 Reagents: Water; rt

Experimental Protocols

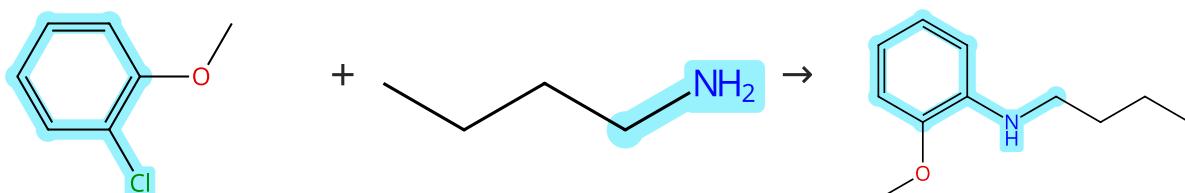
Alternative biarylphosphines for use in the palladium-catalyzed amination of aryl halides

By: Singer, Robert A.; et al

Synthesis (2003), (11), 1727-1731.

Scheme 426 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (66)

Suppliers (72)

Suppliers (15)

31-172-CAS-14204602

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, Bis(1,1-dimethylethyl)[2'-(1-methylethoxy)[1,1'-binaphthalen]-2-yl]phosphine

Solvents: Toluene; rt; 16 h, 110 °C

Experimental Protocols

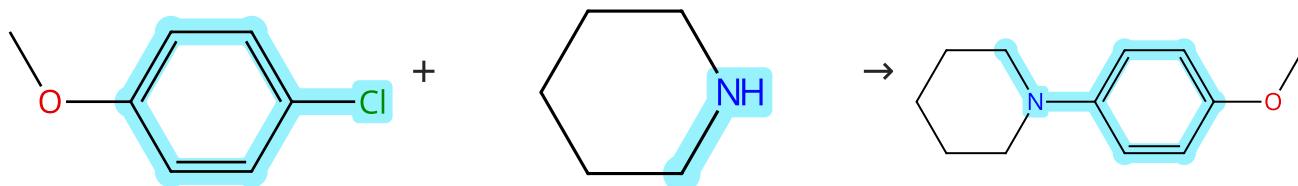
Synthesis of Bulky and Electron-Rich MOP-type Ligands and Their Applications in Palladium-Catalyzed C-N Bond Formation

By: Xie, Xiaomin; et al

Journal of Organic Chemistry (2006), 71(17), 6522-6529.

Scheme 427 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (79)

Suppliers (51)

Suppliers (8)

31-172-CAS-15309657

Steps: 1 Yield: 95%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 40 min, rt

Experimental Protocols

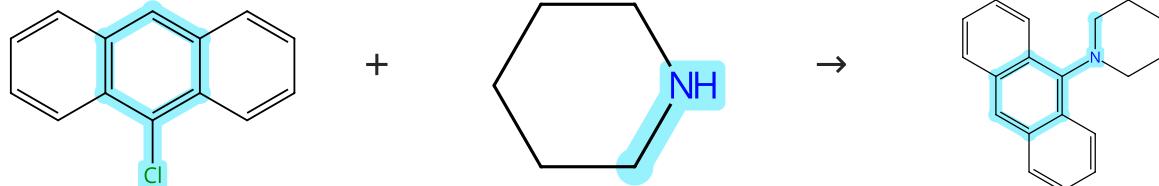
Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 428 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (68)

Suppliers (51)

Suppliers (2)

31-172-CAS-6746235

Steps: 1 Yield: 95%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 60 min, rt

Experimental Protocols

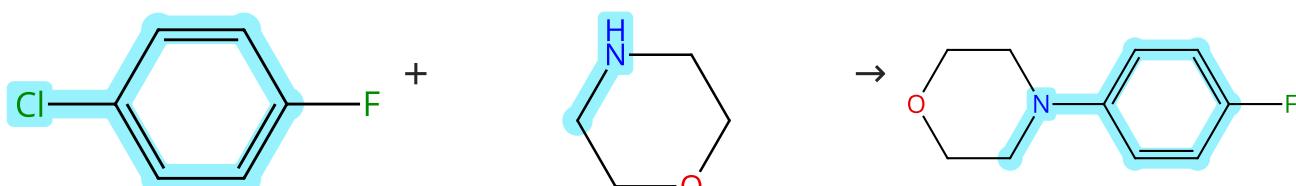
Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 429 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (66)

Suppliers (76)

Suppliers (22)

31-172-CAS-6448783

Steps: 1 Yield: 95%

1.1 Reagents: Potassium carbonate

Catalysts: (*i*Pr₂-4-1)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]dichloro(4,5-dihydro-2-phenyloxazole- κN^3)palladium

Solvents: 1,4-Dioxane; 3 h, 90 °C

Experimental Protocols

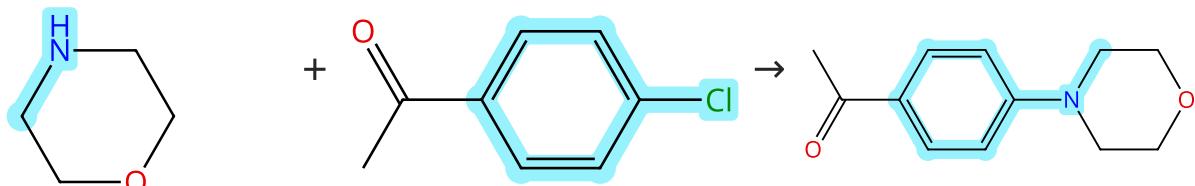
N-Heterocyclic Carbene-Palladium(II)-4,5-Dihydrooxazole Complexes: Synthesis and Catalytic Activity toward Amination of Aryl Chlorides

By: Huang, Pei; et al

Organometallics (2014), 33(7), 1587-1593.

Scheme 430 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (76)

Suppliers (81)

Suppliers (79)

31-172-CAS-3219671

Steps: 1 Yield: 95%

1.1 Reagents: Sodium hydroxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, 2,8,9-Tris(2-methylpropyl)-2,5,8,9-tetraaza-1-phosphabicyclo[3.3.3]undecane

Solvents: Toluene; 40 h, 100 °C

Experimental Protocols

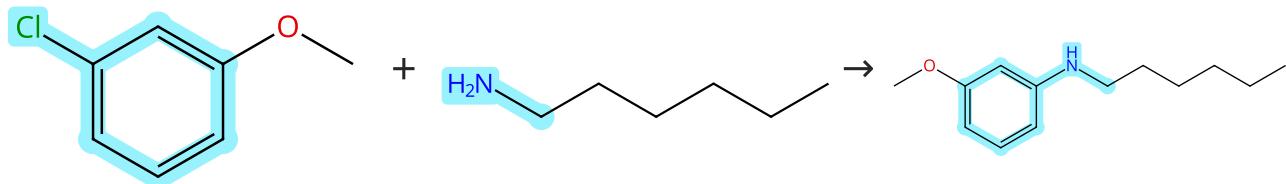
Scope and limitations of Pd₂(dba)₃/P(i-BuNCH₂CH₂)₃N-catalyzed Buchwald-Hartwig amination reactions of aryl chlorides

By: Urgaonkar, Sameer; et al

Journal of Organic Chemistry (2004), 69(26), 9135-9142.

Scheme 431 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (82)

Suppliers (69)

Suppliers (9)

31-172-CAS-12790923

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Bis(dibenzylideneacetone)palladium, 1'-[Bis(1,1-dimethylethyl)phosphino]-1,2,3,4,5-pentaphenylferrocene

Solvents: Toluene

Experimental Protocols

Air stable, sterically hindered ferrocenyl dialkylphosphines for palladium-catalyzed C-C, C-N, and C-O bond-forming cross-couplings

By: Kataoka, Noriyasu; et al

Journal of Organic Chemistry (2002), 67(16), 5553-5566.

Scheme 432 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (69)

Suppliers (70)

Suppliers (8)

31-172-CAS-2317131

Steps: 1 Yield: 95%

1.1 Reagents: Potassium hydroxide, Water

Catalysts: Hexadecyltrimethylammonium bromide, Bis(*tri-tert*-butylphosphine)palladium

Solvents: Toluene

Experimental Protocols

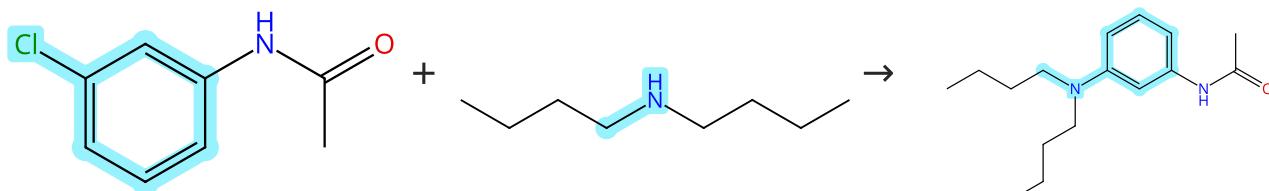
Aqueous Hydroxide as a Base for Palladium-Catalyzed Amination of Aryl Chlorides and Bromides

By: Kuwano, Ryoichi; et al

Journal of Organic Chemistry (2002), 67(18), 6479-6486.

Scheme 433 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (60)

Suppliers (63)

Suppliers (4)

31-172-CAS-12420911

Steps: 1 Yield: 95%

1.1 Reagents: Sodium *tert*-butoxide

Catalysts: Tris(dibenzylideneacetone)dipalladium, X-Phos

Solvents: Toluene; 2 h, 90 °C

1.2 Reagents: Water

Experimental Protocols

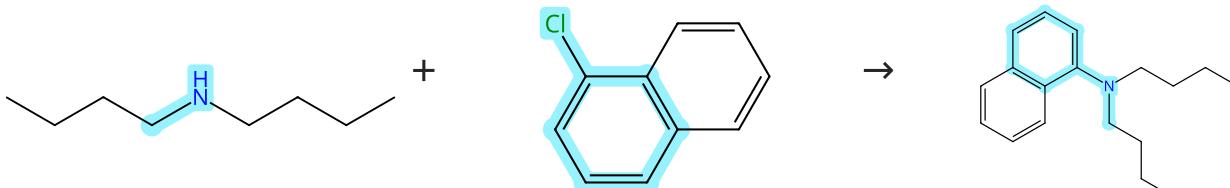
Expanding Pd-Catalyzed C-N Bond-Forming Processes: The First Amidation of Aryl Sulfonates, Aqueous Amination, and Complementarity with Cu-Catalyzed Reactions

By: Huang, Xiaohua; et al

Journal of the American Chemical Society (2003), 125(22), 6653-6655.

Scheme 434 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (63)

Suppliers (95)

Suppliers (4)

31-172-CAS-8592113

Steps: 1 Yield: 95%

1.1 Reagents: Potassium *tert*-butoxideCatalysts: stereoisomer of [1,3-Bis[2,6-bis(1-methylethyl)phenyl]-2-imidazolidinylidene]chloro[(1,2,3- η)-1-phenyl-2-propen-1-yl]palladium

Solvents: 1,2-Dimethoxyethane; 60 min, rt

Experimental Protocols

Modified (NHC)Pd(allyl)Cl (NHC = N-Heterocyclic Carbene) Complexes for Room-Temperature Suzuki-Miyaura and Buchwald-Hartwig Reactions

By: Marion, Nicolas; et al

Journal of the American Chemical Society (2006), 128(12), 4101-4111.

Scheme 435 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (55)

Suppliers (102)

Supplier (1)

31-172-CAS-9583133	Steps: 1 Yield: 95%	3-Aryl-2-oxazolidinones through the palladium-catalyzed N-arylation of 2-oxazolidinones By: Cacchi, Sandro; et al Organic Letters (2001), 3(16), 2539-2541.
1.1 Reagents: Cesium carbonate Catalysts: Tris(dibenzylideneacetone)dipalladium, 1,1'-(9,9-Dimethyl-9 <i>H</i> -xanthene-4,5-diyl)bis[1,1-diphenylphosphine] Solvents: Toluene		
Experimental Protocols		

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