



SciFinder

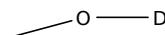
Task History

Initiating Search

February 21, 2025, 6:30 PM

Substances:

Filtered By:



Structure Match: Substructure

Search Tasks

Task	Search Type	View
Returned Substance Results + Filters (12,935)	Substances	View Results
Exported: Retrieved Related Reaction Results + Filters (929)	Reactions	View Results
Filtered By:		
Substance Role:	Reactant, Reagent, Solvent	
Catalyst:	<p>[(1,2,5,6-η)-1,5-Cyclooctadiene][N-[(4,6-dimethoxy-2,3-dimethyl-1H-indol-7-yl-κM)methylene]benzenaminato-κM]rhodium, [(3a,4,5,6,6a-η)-(13cR)-3,7-Dihydro-2,8-dimethoxy-3aH-cyclopenta[6,7]cycloocta[2,1-α:3,4-α']dinaphthalen-3a-yl]bis(η²-ethene)rhodium, (η⁵-2,4-Cyclopentadien-1-yl)[(2,3,5,6-η)-1,2,3,4,5,6-hexamethylbicyclo[2.2.0]hexa-2,5-diene]rhodium, Acetic acid, rhodium(2+) salt, Bis[(1,2,3,4,5-η)-1,3-bis(1,1-dimethylethyl)-2,4-cyclopentadien-1-yl]di-μ-chlorodichlorodirhodium(2+), Bis[(1,2,5,6-η)-1,5-cyclooctadiene]di-μ-hydroxydirhodium, Bis[(1,2,5,6-η)-1,5-cyclooctadiene]di-μ-methoxydirhodium, Bis(η²-ethene)(2,4-pantanediionato-κO,κO')rhodium, Bis(η²-ethene)[(8a,9,10,11,11a-η)-(2aS)-1,2,3,4-tetrahydro-7,13-dimethoxy-8H-cyclopenta[5,6]cyclonona[1,2,3-α:1,9,8-α']diinden-8a(12H)-yl]rhodium, Bis(acetato-κO)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Bis[μ-(acetato-κO,κO')]bis[(1,2,5,6-η)-1,5-cyclooctadiene]dirhodium, Bis[μ-(acetato-κO,κO')]bis(acetato-κO)bis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Chloro[2-(1-methylhydrazinyl-κN²)phenyl-κC][(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Chloro[5-hydroxy-2-[1-[(4-methoxyphenyl)imino-κMethyl]phenyl-κC][(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Dicarbonyl[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Dicarbonylrhodium acetylacetone, Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-</p>	

yl]dirhodium, Di- μ -chlorobis[(1,2,5,6- η)-1,5-cyclooctadiene]dirhodium, Di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1,2,3,4-tetramethyl-5-(trifluoromethyl)-2,4-cyclopentadien-1-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13b*R*)-3,7-dihydro-2,8-dimethoxy-3a*H*-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13b*R*)-3,7-dihydro-4,5,6-trimethyl-3a*H*-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(3a*R*,13b*R*)-3,7-dihydro-2,8-bis(methylenemethyl)-3a*H*-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-5-[2-(dimethylamino)-2-oxoethyl]-4,6-diphenyl-1*H*-cyclopenta[c]furan-3a(3*H*)-yl]dirhodium, Di- μ -chlorodichlorobis(η^5 -2,4-cyclopentadien-1-yl)dirhodium, Di- μ -chlorotetrakis[(1,2- η)-cyclooctene]dirhodium, Di- μ -iododiiodobis[(11a,12,13,14,14a- η)-(6*S*)-4,5,6,7,11-pentahydro-1,10-dimethoxycyclopent[5,6]inden[7',1':8,9,1]cyclonon[1,2,3-*cd*]inden-11a-yl]dirhodium, Dirhodium tetraacetate, Hydro[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl][2-(2-pyridinyl- κ N)phenyl- κ C]rhodium, [N-[2-(Amino- κ N)phenyl]-4-methylbenzenesulfonamido- κ M][(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, (OC-6-14)-Bis(acetato- κ O)aqua[2,6-bis[(4*S*)-4,5-dihydro-4-(1-methylethyl)-2-oxazolyl- κ B³]phenyl- κ C]rhodium, (OC-6-26)-(Acetonitrile)[1,3-bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ N¹, κ O⁸)rhodium, Rhodium, Rhodium(1+), [1,1'-(1,4-butanediyl)bis[1,1-diphenylphosphine- κ P]]-[(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(1,2,5,6- η)-1,5-cyclooctadiene][(1*R*,1'*R*)-1,1'-(1,2-ethanediyl)bis[1-(2-methoxyphenyl)phenylphosphine- κ P]]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(1,2,5,6- η)-1,5-cyclooctadiene][(2*R*,2'*R*,5*R*,5'*R*)-1,1'-(1,2-phenylene)bis[2,5-dimethylphospholane- κ P]]-, perchlorate, Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,1'-(1,2-ethanediyl)bis[1,1-diphenylphosphine- κ P]]-, 1,1,1-trifluoromethanesulfonate (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,1'-(1,4-butanediyyl)bis[1,1-diphenylphosphine- κ P]]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,1'-(1*S*)-[1,1'-binaphthalene]-2,2'-diyl]bis[1,1-diphenylphosphine- κ P]]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][(11a*R*)-4,8-bis(1,1-dimethylethyl)-6-[2-(diphenylphosphino- κ P)phenoxy]-1,2,10,11-tetramethylidibenzo[d,f][1,3,2]dioxaphosphepin- κ P⁶]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,4-butanediyyl]bis[diphenylphosphine- κ P]]-, Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][(2*S*,2'*S*,5*S*,5'*S*)-1,1'-(1,2-phenylene)bis[2,5-dimethylphospholane- κ P]]-, 1,1,1-trifluoromethanesulfonate (1:1), Rhodium(1+), [2-[[bis(1,1-dimethylethyl)phosphino- κ P]methyl]phenyl- κ C]hydrotris(2-propanone), (OC-6-24)-, tetrafluoroborate(1-), Rhodium(1+), [bis(1,1-dimethylethyl)][[(*S*)-(1,1-dimethylethyl)methylphosphino- κ P]methyl]phosphine- κ P][(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), bis[(1,2,5,6- η)-1,5-cyclooctadiene]-, 1,1,1-trifluoromethanesulfonate (1:1), Rhodium(1+), bis[(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), bis[(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][μ -[3,5-bis[(diphenylphosphino)methyl]-1*H*-pyrazolato- κ N¹, κ B⁵: κ N², κ P³]]di-, tetrafluoroborate(1-), Rhodium(1+), bis[(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene]-, tetrafluoroborate(1-) (1:1), Rhodium(2+), bis[[2-(diphenylphosphine- κ P)ethyl](η ⁶

phenyl)phenylphosphine- κP]di-, tetrafluoroborate(1-) (1:2), Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, hexafluorophosphate(1-) (1:2), Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:2), Rhodium, (acetato- κO)[5-fluoro-2-[methyl(nitroso- κN)amino]phenyl- κC][(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1), Rhodium, acetyl[2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)-N²¹,N²²,N²³,N²⁴]-, (SP-5-31)-, Rhodium, bis[(3a,4,5,6,6a- η)-(13bR)-5-(1,1-dimethylethyl)-3,7-dihydro-2,8-dimethoxy-3aH-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]-di- μ -iododiiodododi-, Rhodium, bis[μ -[α , α , α' , α' -tetramethyl-1,3-benzenedipropanoato(2-)- κO^1 , κO^3 , κO^3 , κO^1]di-, (Rh-Rh), Rhodium, di- μ -chlorodichlorobis[(1,2,3,3a,7a- η)-1,2,3,4,5,6,7-heptamethyl-1H-inden-1-yl]di-, stereoisomer, Rhodium, di- μ -iododiiodobis[(11a,12,13,14,14a- η)-4,5,6,7,11-pentahydro-1,10-dimethoxy-2,4,4,7,7,9-hexamethylcyclopent[5,6]indenol[7',1':8,9,1]cyclonon[1,2,3- α]inden-11a-yl]di-, stereoisomer, Rhodium, di- μ -iododiiodobis[(3a,4,5,6,6a- η)-(13bR)-4,5,6-trimethyl-3aH-cyclopenta[b]dinaphtho[2,1- ϵ :1'2'-g][1,4]dioxocin-3a-yl]di-, Rhodium sulfide, Rhodium, tetracarbonyldi- μ -chlorodi-, Rhodium, tetrakis[μ -(hexahydro-2H-azepin-2-onato- κN^1 : κO^2)]di-, (Rh-Rh), Rhodium, tetrakis[μ -(octanoato- κO : κO)]di-, (Rh-Rh), Rhodium trichloride, Rhodium trichloride hydrate, Rhodium trichloride trihydrate, (SP-4-2)-Bis(methan- d_3 -ol- d)[(1S,1'S)-1,1'-(1,2-phenylene)bis[1-(1,1-dimethylethyl)-1-methylphosphine- κP]]rhodium(1+), (SP-4-2)-Chlorotris(triphenylphosphine)rhodium, (SP-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2H-imidazol-2-ylidene]chlorohydro(2-methyl-8-quinolinolato- κN^1 , κO^3)rhodium, (SP-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2H-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κN^1 , κO^3)rhodium, Stereoisomer of bis[(3a,4,5,6,6a- η)-(13bR)-3,7-dihydro-2,8-bis[[tris(1-methylethyl)silyl]oxy]-3aH-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]di- μ -iododiiododirhodium, Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,3a,7a- η)-4,5,6,7-tetrahydro-1,3-diphenyl-1H-inden-1-yl]dirhodium, Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]dirhodium, Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1-cyclohexyl-2,3,4,5-tetramethyl-2,4-cyclopentadien-1-yl]dirhodium, Triaquatrichlororhodium, Tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium(2+)

Document

Type:

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Journal

English

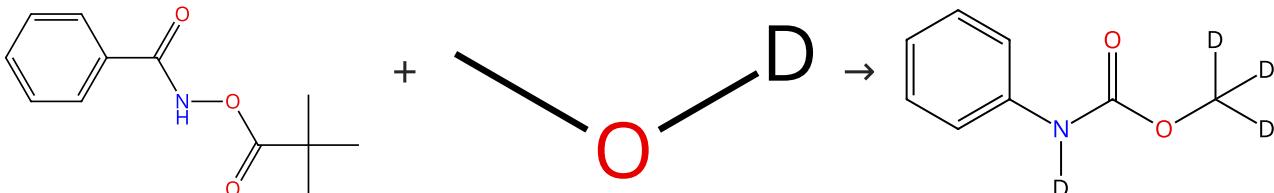


Reactions (462)

[View in CAS SciFinder](#)

Scheme 1 (1 Reaction)

Steps: 1 Yield: 100%


[Suppliers \(14\)](#)
[Suppliers \(49\)](#)

31-614-CAS-28434349

Steps: 1 Yield: 100%

Rhodium(III)-Catalyzed C-H Activation/Annulation with Vinyl Esters as an Acetylene Equivalent

1.1 Reagents: Mesitylene

Catalysts: Cesium acetate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol- d_4 ; 4 h, rt \rightarrow 60 °C

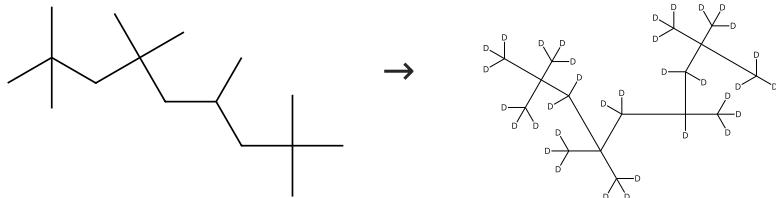
By: Webb, Nicola J.; et al

Organic Letters (2014), 16(18), 4718-4721.

Experimental Protocols

Scheme 2 (1 Reaction)

Steps: 1 Yield: 100%


[Suppliers \(63\)](#)

31-116-CAS-9328666

Steps: 1 Yield: 100%

Multiple deuteriation of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system
1.1 Reagents: Water- d_2
Catalysts: Platinum, Rhodium
Solvents: 2-Propan-1,1,1,2,3,3,3- d_7 -ol- d_4 ; 24 h, 120 °C

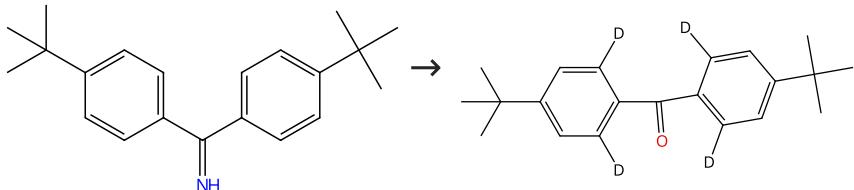
By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Experimental Protocols

Scheme 3 (1 Reaction)

Steps: 1 Yield: 99%



31-614-CAS-24767042

Steps: 1 Yield: 99%

Rhodium(III)-Catalyzed Cascade Reactions of Imines/Imidates with 4-Hydroxy-2-Alkynoates to synthesize Regioselective Furanone-Fused Isoquinoline Scaffolds
1.1 Reagents: Cupric acetate, Cesium carbonate, Methanol- d_4
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,4-Dioxane; 16 h, 120 °C

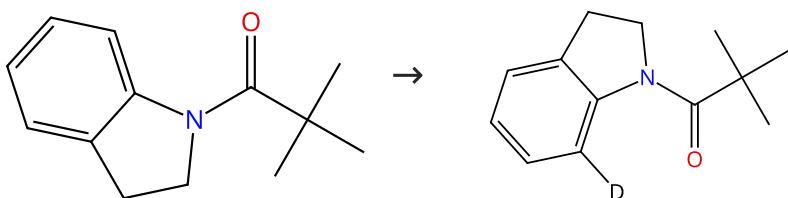
By: Kumar, Anil; et al

Journal of Organic Chemistry (2021), 86(24), 17965-17974.

Experimental Protocols

Scheme 4 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (10)

31-116-CAS-4285330

Steps: 1 Yield: 99%

1.1 **Reagents:** Sodium acetate, Methanol-*d*
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 20 h, 130 °C

Rhodium(III)-Catalyzed Selective C-H Cyanation of Indolines and Indoles with an Easily Accessible Cyano Source

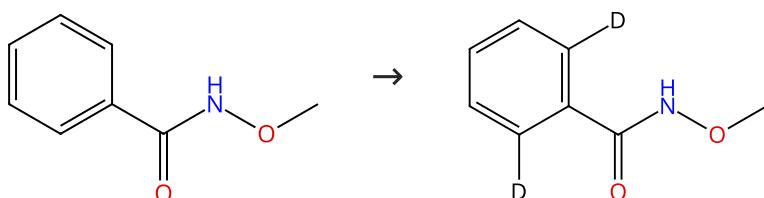
By: Mishra, Neeraj Kumar; et al

Advanced Synthesis & Catalysis (2015), 357(6), 1293-1298.

Experimental Protocols

Scheme 5 (9 Reactions)

Steps: 1 Yield: 60-99%



Suppliers (49)

31-614-CAS-25060354

Steps: 1 Yield: 99%

1.1 **Reagents:** Methanol-*d*₄, Cesium acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Tetrahydrofuran; 12 h, 80 °C

Rh(III)-catalyzed diastereoselective cascade annulation of enone-tethered cyclohexadienones via C(sp²)-H bond activation

By: Jadhav, Sandip B.; et al

Chemical Communications (Cambridge, United Kingdom) (2021), 57(99), 13598-13601.

Experimental Protocols

31-614-CAS-38298839

Steps: 1 Yield: 96%

1.1 **Reagents:** Methanol-*d*₄
Catalysts: Sodium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Ethanol; 12 h, 25 - 30 °C

Green Synthesis of 3,4-Unsubstituted Isoquinolones through Rhodium(III)-Catalyzed C-H Activation and Annulation in Ethanol

By: Kumar, Vikash; et al

European Journal of Organic Chemistry (2023), 26(44), e202300914.

Experimental Protocols

31-116-CAS-1563532

Steps: 1 Yield: 95%

1.1 **Reagents:** Pivalic acid, Acetone-*d*₆, Methanol-*d*₄, Oxygen
Catalysts: Cesium acetate, Cuprous chloride, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 48 h, rt

Hydroxyamination of aryl C-H bonds with N-hydroxycarbamate by synergistic Rh/Cu catalysis at room temperature

By: Yang, Wei; et al

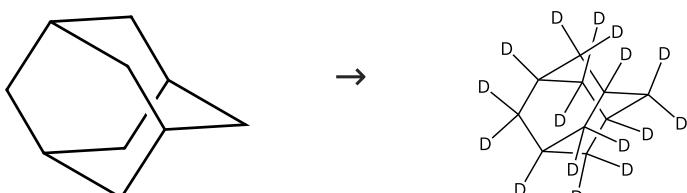
Chemical Communications (Cambridge, United Kingdom) (2014), 50(34), 4420-4422.

Experimental Protocols

31-116-CAS-13224683	Steps: 1 Yield: 95%	Rhodium(III)-Catalyzed Isoquinolone Synthesis: The N-O Bond as a Handle for C-N Bond Formation and Catalyst Turnover By: Guimond, Nicolas; et al Journal of the American Chemical Society (2010), 132(20), 6908-6909.
1.1 Reagents: Cesium acetate Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium] Solvents: Methanol- d_4 ; 16 h, 60 °C	Experimental Protocols	
31-614-CAS-31487520	Steps: 1 Yield: 60%	Rh-Catalysed cascade C-H imidization/cyclization of N-methoxybenzamides with isoxazolones for the assembly of dihydroquinazolin-4(1H)-one derivatives By: Zhong, Xiuhua; et al Organic Chemistry Frontiers (2022), 9(7), 1904-1910.
1.1 Reagents: Acetic acid, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1) Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium] Solvents: 2,2,2-Trifluoroethan-1,1- d_2 -ol- d ; 5 h, 100 °C	Experimental Protocols	
31-614-CAS-36316051	Steps: 1	2-Butyne Biscarbonate as a "Bridge" in Rhodium(III)-Catalyzed [4 + 2] Cyclization and Diels-Alder Reaction By: Yan, Xinxin; et al Organic Letters (2023), 25(17), 2953-2957.
1.1 Reagents: Sodium acetate Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium] Solvents: Methanol- d_4 ; 3 h, rt	Experimental Protocols	
31-614-CAS-35968455	Steps: 1	Rh(III)-catalyzed redox-neutral C-H alkenylation of benzamides with gem-difluorohomoallylic silyl ethers via β-H elimination By: Cui, Xueli; et al Chemical Communications (Cambridge, United Kingdom) (2023), 59(25), 3747-3750.
1.1 Reagents: Sodium bicarbonate, Methanol- d_4 Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (<i>OC</i> -6-11)-hexafluoro antimonate(1-) (1:2) Solvents: Dimethylformamide; 24 h, 70 °C	Experimental Protocols	
31-614-CAS-24688760	Steps: 1	Redox-neutral rhodium(III)-catalyzed chemo- and regioselective [4+1] annulation between benzamides and alkenes for the synthesis of functionalized isoindolinones By: Qiao, Jin; et al Organic & Biomolecular Chemistry (2021), 19(45), 9946-9952.
1.1 Reagents: Sodium acetate, Methanol- d_4 Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 6 h, 60 °C	Experimental Protocols	
31-116-CAS-19285701	Steps: 1	One-Pot Synthesis of Fused N,O-Heterocycles through Rh(III)-Catalyzed Cascade Reactions of Aromatic/Vinylic N-Alkoxy-Amides with 4-Hydroxy-2-Alkynoates By: Xu, Yuanshuang; et al Advanced Synthesis & Catalysis (2018), 360(14), 2613-2620.
1.1 Reagents: Methanol- d_4 , Potassium fluoride Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,2-Dimethoxyethane; 40 min, 100 °C	Experimental Protocols	

Scheme 6 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (113)

Suppliers (38)

31-116-CAS-9783276

Steps: 1 Yield: 99%

1.1 Reagents: Water-*d*₂

Catalysts: Platinum, Rhodium

Solvents: 2-Propan-1,1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C

Experimental Protocols

Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 7 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (59)

31-116-CAS-15190928

Steps: 1 Yield: 99%

1.1 Reagents: Water-*d*₂

Catalysts: Platinum, Rhodium

Solvents: 2-Propan-1,1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C

Experimental Protocols

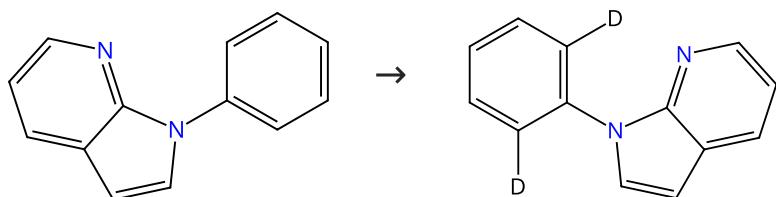
Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 8 (1 Reaction)

Steps: 1 Yield: 99%



Suppliers (6)

31-116-CAS-23087091

Steps: 1 Yield: 99%

1.1 Reagents: Cupric acetate, Methanol-*d*₄, Cesium acetateCatalysts: Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium; rt; 4 h, 50 °C

Experimental Protocols

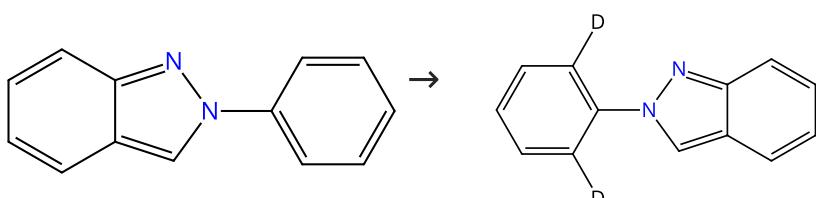
Rhodium(III)-catalyzed oxidative alkylation of N-aryl-7-azaindoles with cyclopropanols

By: Liu, Jidan; et al

Organic & Biomolecular Chemistry (2021), 19(5), 993-997.

Scheme 9 (1 Reaction)

Steps: 1 Yield: 99%

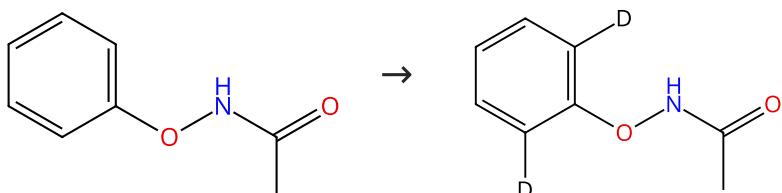


Suppliers (36)

31-116-CAS-22452019	Steps: 1 Yield: 99%	Rh(III)-Catalyzed C-H Cyanation of 2H-Indazole with N-Cyano-N-phenyl-p-toluenesulfonamide By: Li, Jing; et al Journal of Organic Chemistry (2020), 85(16), 10835-10845.
1.1 Reagents: Potassium acetate, Methanol- <i>d</i> ₄ , Oxygen, Silver hexafluoroantimonate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,2-Dichloroethane; 3 h, 120 °C 1.2 Reagents: Ethyl acetate		

Scheme 10 (11 Reactions)

Steps: 1 Yield: 5-99%



Suppliers (11)

31-614-CAS-35120346	Steps: 1 Yield: 99%	Redox-neutral rhodium(III)-catalyzed divergent synthesis of tetrasubstituted 1,3-enynes and alkynylated benzofurans By: Gong, Xin; et al Organic & Biomolecular Chemistry (2023), 21(1), 147-152.
1.1 Reagents: Zinc acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Methanol- <i>d</i> ₄ ; 5 min, 25 °C Experimental Protocols		

31-116-CAS-9022303	Steps: 1 Yield: 96%	Rhodium(III)-Catalyzed Redox-Neutral Coupling of N-Phenoxyacetamides and Alkynes with Tunable Selectivity By: Liu, Guixia; et al Angewandte Chemie, International Edition (2013), 52(23), 6033-6037.
1.1 Catalysts: Cesium acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Methanol- <i>d</i> ₄ ; 3 h, rt Experimental Protocols		

31-614-CAS-37019266	Steps: 1 Yield: 86%	Rhodium-catalyzed enantioselective annulation of N-phenoxyacetamides with 1,3-dienes By: Yang, Hui; et al Science China: Chemistry (2023), 66(10), 2842-2846.
1.1 Reagents: Zinc acetate, Methanol- <i>d</i> ₄ Catalysts: Cupric acetate, Rhodium, bis[(3a,4,5,6,6a-η)-(13b <i>R</i>)-5-(1,1-dimethylethyl)-3,7-dihydro-2,8-dimethoxy-3a <i>H</i> -cyclopenta[6,7]cycloocta[2,1- <i>a</i> :3,4- <i>a'</i>]dinaphthalen-3a-yl]-di-μ-iododiiododi-; 32 h, rt Experimental Protocols		

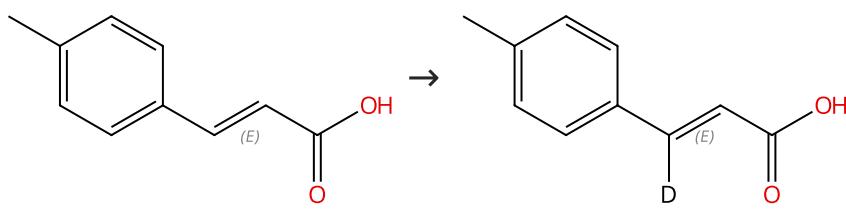
31-116-CAS-23315075	Steps: 1 Yield: 75%	Rh(III)-Catalyzed Redox-Neutral C-H Activation/[3+2] Annulation of N-Phenoxy Amides with Propargylic Monofluoralkynes By: Zhong, Xiuhua; et al Organic Letters (2021), 23(6), 2285-2291.
1.1 Reagents: Sodium acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 2 h, 80 °C Experimental Protocols		

31-116-CAS-14176358	Steps: 1 Yield: 5%	Rh(III)-catalyzed and alcohol-involved carbенoid C-H insertion into N-phenoxyacetamides using α-diazomalonates By: Zhou, Jie; et al Chemical Communications (Cambridge, United Kingdom) (2015), 51(27), 5868-5871.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (<i>O</i> -C-6-11)-hexafluoroantimonate(1-) (1:2); 3 h, rt Experimental Protocols		

31-614-CAS-31689902	Steps: 1	Specific assembly of dihydrobenzofuran frameworks via Rh(II) I)-catalyzed C-H coupling of N-phenoxyacetamides with 2-alkenylphenols By: Wei, Yinhui; et al New Journal of Chemistry (2022), 46(12), 5705-5711.
1.1 Reagents: Zinc acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 4 h, rt Experimental Protocols	Steps: 1	Rh(III)-Catalyzed Stereoselective C-C Bond Cleavage of ACPs with N-Phenoxyacetamides: The Critical Role of the Nucleophilic Directing Group By: Singh, Anurag; et al Journal of Organic Chemistry (2021), 86(15), 10474-10483.
31-614-CAS-24049891	Steps: 1	Rhodium(III)-Catalyzed Cascade C-H Coupling/C-Terminus Michael Addition of N-Phenoxy Amides with 1,6-Enynes By: Wei, Yinhui; et al ChemistrySelect (2021), 6(25), 6574-6578.
1.1 Reagents: Zinc acetate, 2,2,2-Trifluoroethan-1- <i>d</i> ₂ -ol- <i>d</i> Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 24 h, 60 °C Experimental Protocols	Steps: 1	Rh(III)-Catalyzed ion/[3 + 2] Annulation of C-H ActivatN-Phenoxyacetamides via Carbooxygenation of 1,3-Dienes By: Wu, Liexin; et al Organic Letters (2021), 23(10), 3844-3849.
31-116-CAS-23579020	Steps: 1	Chiral Allylic Amine Synthesis Enabled by the Enantios selective Cp ^X Rh(III)-Catalyzed Carboaminations of 1,3-Dienes By: Wu, Liexin; et al ACS Catalysis (2021), 11(4), 2279-2287.
1.1 Reagents: Zinc acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 14 h, 60 °C Experimental Protocols	Steps: 1	Rh(III)-Catalyzed ortho-C-H alkynylation of N-phenoxyacetamides with hypervalent iodine-alkyne reagents at room temperature By: Hu, Sisheng; et al Organic & Biomolecular Chemistry (2018), 16(1), 43-47.
31-116-CAS-18336276	Steps: 1	Double bond geometry shown
1.1 Reagents: Methanol- <i>d</i> ₄ , Cesium acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 5 h, rt	Double bond geometry shown	Double bond geometry shown

Scheme 11 (1 Reaction)

Steps: 1 Yield: 99%



Double bond geometry shown

Double bond geometry shown

Suppliers (49)

31-116-CAS-20659799

Steps: 1 Yield: 99%

- 1.1 **Reagents:** Sodium acetate, Oxygen, Water- d_2
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoroantimonate(1-) (1:2)
Solvents: Methanol- d_4 ; 24 h, 90 °C
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Dichloromethane, Water; 15 min

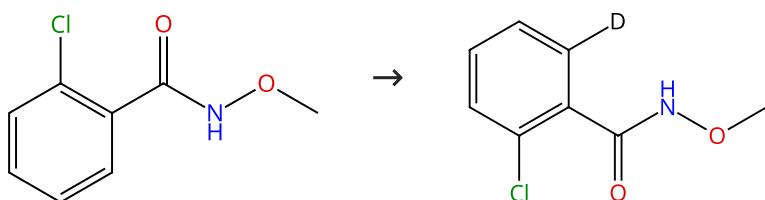
A Protocol for the Ortho-Deuteration of Acidic Aromatic Compounds in D₂O Catalyzed by Cationic Rh^{III}

By: Garreau, Alyssa L.; et al

Organic Letters (2019), 21(17), 7044-7048.

Scheme 12 (1 Reaction)

Steps: 1 Yield: 98%



Suppliers (10)

31-116-CAS-18305312

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Sodium acetate, Sodium bicarbonate
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoroantimonate(1-) (1:2)
Solvents: Methanol- d_4 ; 1 h, 60 °C

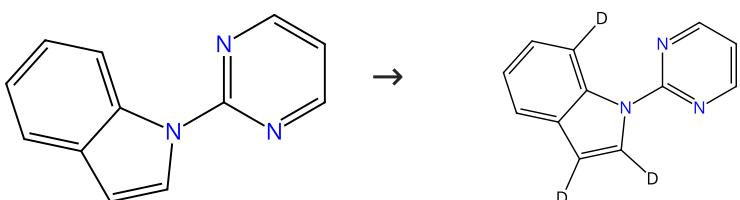
Microwave-Assisted Synthesis of Heterocycles by Rhodium(III)-Catalyzed Annulation of N-Methoxyamides with α -Chloroaldehydes

By: Huang, Ji-Rong; et al

Angewandte Chemie, International Edition (2017), 56(50), 15921-15925.

Scheme 13 (8 Reactions)

Steps: 1 Yield: 67-98%



Suppliers (59)

31-116-CAS-8520482

Steps: 1 Yield: 98%

- 1.1 **Reagents:** Sodium acetate, Methanol- d
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 20 h, 110 °C

Rhodium(III)-Catalyzed Selective C-H Cyanation of Indolines and Indoles with an Easily Accessible Cyano Source

By: Mishra, Neeraj Kumar; et al

Advanced Synthesis & Catalysis (2015), 357(6), 1293-1298.

Experimental Protocols

31-614-CAS-32272022

Steps: 1 Yield: 95%

- 1.1 **Reagents:** Methanol- d_4
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Toluene; 20 h, 80 °C

Rh(III)-Catalyzed three-component C-H functionalization reaction with vinylene carbonate: Late-stage C-H esterification of indole derivatives

By: Li, Bin-Shi; et al

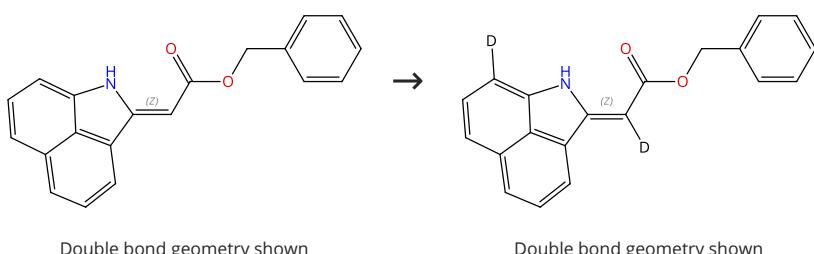
Tetrahedron Letters (2022), 99, 153854.

Experimental Protocols

31-614-CAS-34866694	Steps: 1 Yield: 94%	Methylene Thiazolidinediones as Alkylation Reagents in Catalytic C-H Functionalization: Rapid Access to Glitazones By: Byun, Youjung; et al Organic Letters (2022), 24(46), 8578-8583.
1.1 Reagents: Sodium acetate, Methanol- <i>d</i> ₄ , 2,4-Thiazolidinedione, 3-methyl-5-methylene- Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,2-Dichloroethane; 20 h, 110 °C	Experimental Protocols	
31-116-CAS-16199145	Steps: 1 Yield: 91%	Ruthenium(II)- or Rhodium(III)-Catalyzed Grignard-Type Addition of Indolines and Indoles to Activated Carbonyl Compounds By: Jo, Hyeim; et al Advanced Synthesis & Catalysis (2016), 358(17), 2714-2720.
1.1 Reagents: Sodium acetate, Methanol- <i>d</i> Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,2-Dichloroethane; 20 h, 60 °C	Experimental Protocols	
31-116-CAS-4649989	Steps: 1 Yield: 90%	Rh(III)-Catalyzed C-H Amidation of Indoles with Isocyanates By: Jeong, Taejoo; et al Journal of Organic Chemistry (2015), 80(14), 7243-7250.
1.1 Reagents: Methanol- <i>d</i> Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,2-Dichloroethane; 20 h, 110 °C; 110 °C → rt	Experimental Protocols	
31-614-CAS-24833110	Steps: 1 Yield: 87%	TFA-Prompted/Rh(III)-Catalysed Chemoselective C ₃ - or C ₂ -H Functionalization of Indoles with Methylenecyclopropanes By: Wu, Min; et al European Journal of Organic Chemistry (2021), 2021(40), 5507-5517.
1.1 Reagents: Pivalic acid, Methanol- <i>d</i> ₄ Catalysts: Cupric acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 4 h, 80 °C	Experimental Protocols	
31-116-CAS-22361432	Steps: 1 Yield: 67%	The copper(II)-catalyzed and oxidant-promoted regioselective C-2 difluoromethylation of indoles and pyrroles By: Zhang, Dong; et al Chemical Communications (Cambridge, United Kingdom) (2020), 56(58), 8119-8122.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,2-Dichloroethane; 20 h, 110 °C	Experimental Protocols	
31-116-CAS-20302288	Steps: 1	Rhodium-Catalyzed C-H Functionalization of N-(2-Pyrimidyl) indole with Internal Alkynes: Formation of Unexpected Products by Regulating the Amount of Silver Acetate By: Li, Tongyu; et al Advanced Synthesis & Catalysis (2019), 361(12), 2855-2863.
1.1 Reagents: Silver acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,2-Dichloroethane, Ethanol- <i>d</i>		

Scheme 14 (1 Reaction)

Steps: 1 Yield: 98%



31-116-CAS-22359817

Steps: 1 Yield: 98%

1.1 Reagents: Ethanol-*d*₆Catalysts: Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodiumSolvents: *o*-Xylene; 5 h, 80 °C

Experimental Protocols

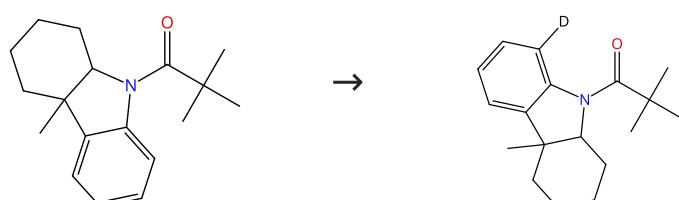
Rh^{III}-Catalyzed Double Dehydrogenative Coupling of Free 1-Naphthylamines with α,β -Unsaturated Esters

By: Rej, Supriya; et al

Chemistry - A European Journal (2020), 26(49), 11093-11098.

Scheme 15 (1 Reaction)

Steps: 1 Yield: 98%



Supplier (1)

31-116-CAS-13718298

Steps: 1 Yield: 98%

1.1 Reagents: Cupric acetate, Methanol-*d*Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Tetrahydrofuran; 20 h, 80 °C

Experimental Protocols

Direct and Site-Selective Palladium-Catalyzed C-7 Acylation of Indolines with Aldehydes

By: Shin, Youngmi; et al

Advanced Synthesis & Catalysis (2015), 357(2-3), 594-600.

Scheme 16 (1 Reaction)

Steps: 1 Yield: 97%

Absolute stereochemistry shown,
Rotation (-)

Relative stereochemistry shown

Supplier (49)

31-116-CAS-3934401

Steps: 1 Yield: 97%

1.1 Reagents: Deuterium

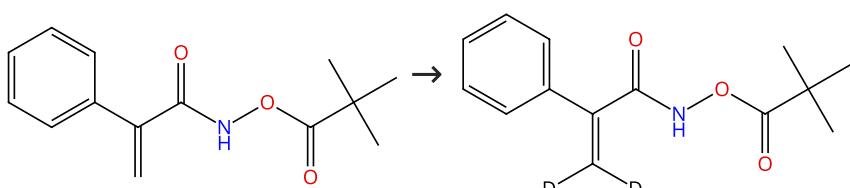
Catalysts: (*SP*-4-2)-Chlorotris(triphenylphosphine)rhodiumSolvents: Methanol-*d*; 2 d, 1 atm, rt**Asymmetric conjugate reductions with samarium diiodide: asymmetric synthesis of (2*S*,3*R*)- and (2*S*,3*S*)-[2-²H,3-²H]-leucine-(S)-phenylalanine dipeptides and (2*S*,3*R*)-[2-²H,3-²H]-phenylalanine methyl ester**

By: Davies, Stephen G.; et al

Organic & Biomolecular Chemistry (2005), 3(8), 1435-1447.

Scheme 17 (1 Reaction)

Steps: 1 Yield: 97%



Supplier (1)

31-614-CAS-39111538

Steps: 1 Yield: 97%

1.1 Reagents: Sodium acetate

Catalysts: Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13bR)-3,7-dihydro-4,5,6-trimethyl-3aH-cyclopenta[6,7]cycloocta[2,1-a:3,4-a']dinaphthalen-3a-yl]dirhodiumSolvents: Methanol-*d*₄; 6 h, 25 °C

Experimental Protocols

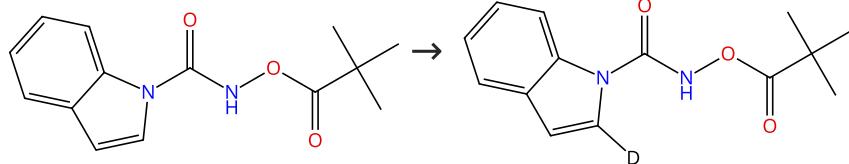
The synthesis of spirocyclopropane skeletons enabled by Rh(II)I-catalyzed enantioselective C-H activation/[4 + 2] annulation

By: Wang, Hao; et al

Chem Catalysis (2023), 3(12), 100822.

Scheme 18 (1 Reaction)

Steps: 1 Yield: 97%



31-614-CAS-39111544

Steps: 1 Yield: 97%

1.1 Reagents: Sodium carbonate

Catalysts: Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13bR)-3,7-dihydro-4,5,6-trimethyl-3aH-cyclopenta[6,7]cycloocta[2,1-a:3,4-a']dinaphthalen-3a-yl]dirhodiumSolvents: Methanol-*d*₄; 6 h, 25 °C

Experimental Protocols

The synthesis of spirocyclopropane skeletons enabled by Rh(II)I-catalyzed enantioselective C-H activation/[4 + 2] annulation

By: Wang, Hao; et al

Chem Catalysis (2023), 3(12), 100822.

Scheme 19 (1 Reaction)

Steps: 1 Yield: 97%



31-116-CAS-15601729

Steps: 1 Yield: 97%

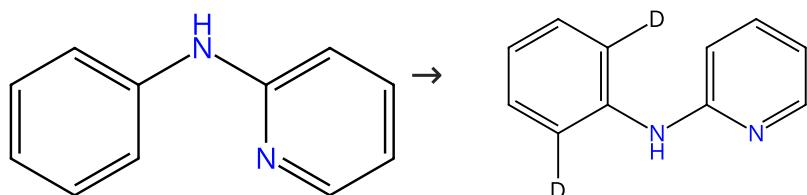
Synthesis of Ferrocene-Based Pyridinones through Rh(III)-Catalyzed Direct C-H Functionalization Reaction

By: Wang, Shao-Bo; et al

Organometallics (2016), 35(10), 1420-1425.

Scheme 20 (2 Reactions)

Steps: 1 Yield: 76-97%



Suppliers (73)

31-116-CAS-20723502

Steps: 1 Yield: 97%

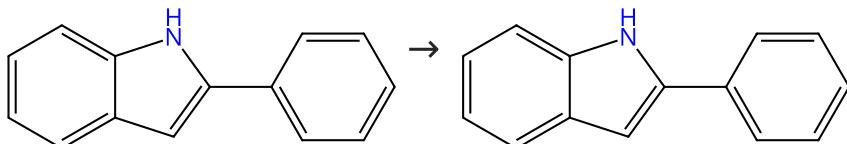
Scalable Rhodium(III)-Catalyzed Aryl C-H Phosphorylation Enabled by Anodic Oxidation Induced Reductive Elimination

By: Wu, Zheng-Jian; et al

Angewandte Chemie, International Edition (2019), 58(47), 16770-16774.

31-614-CAS-24343449	Steps: 1 Yield: 76%	Benzocarbazole Synthesis via Visible-Light-Accelerated Rh(III)-Catalyzed C-H Annulation of Aromatic Amines with Bicyclic Alkenes By: Wang, Yichun; et al Organic Letters (2021), 23(20), 7740-7745.
1.1 Reagents: Silver acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Red 21, [1,1,1-Trifluoro- <i>N</i> -[(trifluoromethyl)sulfonyl]-κ <i>O</i>]methanesulfonamidato-κ <i>O</i>]silver Solvents: 1,2-Dichloroethane; 12 h, rt	Experimental Protocols	

Scheme 21 (2 Reactions) Steps: 1 Yield: 96-97%

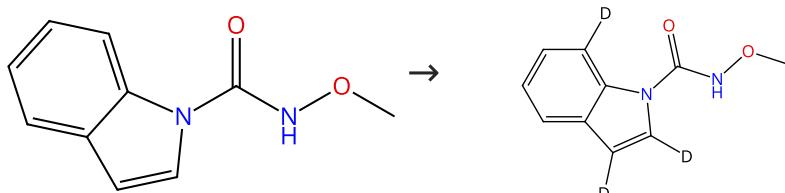


Suppliers (88)

31-614-CAS-27085826	Steps: 1 Yield: 97%	Rhodium(III)-catalyzed indole-directed carbenoid aryl C-H insertion/cyclization: access to 1,2-benzocarbazoles By: Zhang, Zhenhui; et al RSC Advances (2017), 7(49), 30554-30558.
1.1 Reagents: Sodium carbonate, Methanol- <i>d</i> ₄ Catalysts: Sodium acetate, Cuprous chloride, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Acetonitrile; 8 h, 80 °C		

31-614-CAS-26039554	Steps: 1 Yield: 96%	Rhodium-Catalyzed Selective Oxidative (Spiro)annulation of 2-Arylindoles by Using Benzoquinone as a C2 or C1 Synthon By: Guo, Shenghai; et al Organic Letters (2019), 21(16), 6437-6441.
1.1 Reagents: Triethylamine, Methanol- <i>d</i> ₄ Catalysts: Cesium acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Chlorobenzene; 10 h, 140 °C		

Scheme 22 (7 Reactions) Steps: 1 Yield: 96%



Supplier (1)

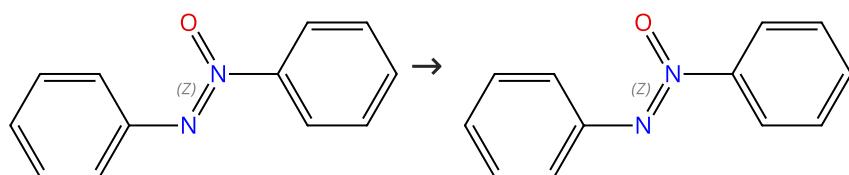
31-614-CAS-31155172	Steps: 1 Yield: 96%	Rh(III)-Catalyzed Selective Olefination of N-Carboxamide Indoles with Unactivated Olefins at Room Temperature via an Internal Oxidation By: Prusty, Priyambada; et al Organic Letters (2022), 24(5), 1121-1126.
1.1 Reagents: Sodium acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Tetrahydrofuran; 6 h, rt	Experimental Protocols	

31-614-CAS-41688621	Steps: 1	Synthesis of γ-Spirolactams via Rh(III)-Catalyzed C-H Activation/Directing Group Migration/Dearomatization /Spiroannulation of Indoles with 1,3-Enynes By: Kumar, Sanjeev; et al Organic Letters (2024), 26(42), 8975-8981.
1.1 Reagents: Pivalic acid, Methanol- <i>d</i> ₄ Catalysts: Silver acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Dichloromethane; 10 min, 60 °C	Experimental Protocols	

31-614-CAS-24612287	Steps: 1	Chemo-, Regio-, and Stereoselective Assembly of Polysubstituted Furan-2(5H)-ones Enabled by Rh(III)-Catalyzed Domino C-H Alkenylation/Directing Group Migration/Lactonization: A Combined Experimental and Computational Study By: Zhao, Fei; et al ACS Catalysis (2021), 11(22), 13921-13934.
Experimental Protocols		
31-614-CAS-24050589	Steps: 1	Chemo- and Regioselective Synthesis of Functionalized 1H-imidazo[1,5-a]indol-3(2H)-ones via a Redox-Neutral Rhodium(II)-Catalyzed [4+1] Annulation between Indoles and Alkynes By: Zhao, Fei; et al Advanced Synthesis & Catalysis (2021), 363(18), 4380-4389.
Experimental Protocols		
31-116-CAS-23853762	Steps: 1	Rh(III)-Catalyzed Divergent Synthesis of Alkynylated Imidazo[1,5-a]indoles and α,α -Difluoromethylene Tetrasubstituted Alkenes By: Zhao, Fei; et al Organic Letters (2021), 23(15), 5766-5771.
Experimental Protocols		
31-116-CAS-23869258	Steps: 1	Redox-Neutral Rhodium(III)-Catalyzed Chemospecific and Regiospecific [4+1] Annulation between Indoles and Alkenes for the Synthesis of Functionalized Imidazo[1,5-a]indoles By: Zhao, Fei; et al Journal of Organic Chemistry (2021), 86(15), 10591-10607.
Experimental Protocols		
31-116-CAS-23632493	Steps: 1	Rh(III)-Catalyzed Chemodivergent Annulations between Indoles and Iodonium Carbenes: A Rapid Access to Tricyclic and Tetracyclic N-Heterocycles By: Nunewar, Saiprasad; et al Organic Letters (2021), 23(11), 4233-4238.
Experimental Protocols		
Scheme 23 (1 Reaction)		Steps: 1 Yield: 96%
31-116-CAS-3835761	Steps: 1 Yield: 96%	Rh(III)-Catalyzed [4 + 2] Annulation of Indoles with Diazo Compounds: Access to Pyrimido[1,6-a]indole-1(2H)-ones By: Chen, Xun; et al Organic Letters (2016), 18(2), 192-195.
Experimental Protocols		

Scheme 24 (1 Reaction)

Steps: 1 Yield: 96%



Double bond geometry shown

Double bond geometry shown

Suppliers (10)

31-614-CAS-28669761

Steps: 1 Yield: 96%

1.1 Reagents: Cupric acetate

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate, Zinc triflateSolvents: 2-Propan-2-d-ol-*d*, 1,1,1,3,3,3-hexafluoro-; 5 min, rt; 1 h, 80 °C**Rh(III)-Catalyzed [4 + 1]-Annulation of Azoxy Compounds with Alkynes: A Regioselective Approach to 2H-Indazoles**

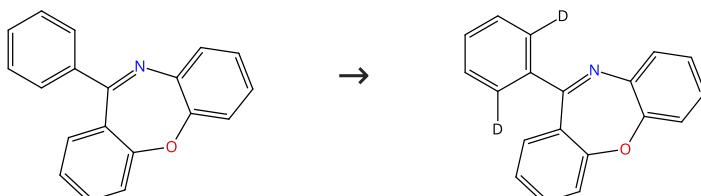
By: Long, Zhen; et al

Organic Letters (2017), 19(11), 2781-2784.

Experimental Protocols

Scheme 25 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (5)

31-614-CAS-36488066

Steps: 1 Yield: 96%

1.1 Reagents: Sodium acetate, Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 2,2,2-Trifluoroethanol; 2 h, 60 °C

Synthesis of indene-fused spiro-dibenz(ox)azepines via Rh(III)-catalyzed cascade regioselective C-H activation/annulation

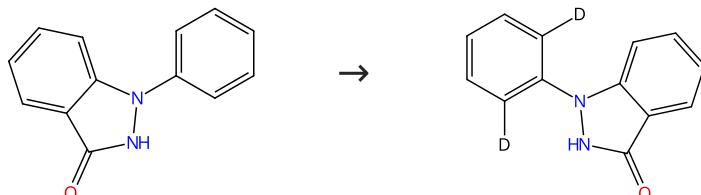
By: Naskar, Koushik; et al

Chemical Communications (Cambridge, United Kingdom) (2023), 59(50), 7751-7754.

Experimental Protocols

Scheme 26 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (15)

31-614-CAS-24621064

Steps: 1 Yield: 96%

1.1 Reagents: Methanol-*d*₄Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*C₆-11)-hexafluoro antimonate(1-) (1:2); 7 h, 100 °C**Synthesis of Cinnolines via Rh(III)-Catalyzed Annulation of N-Aryl Heterocycles with Vinylene Carbonate**

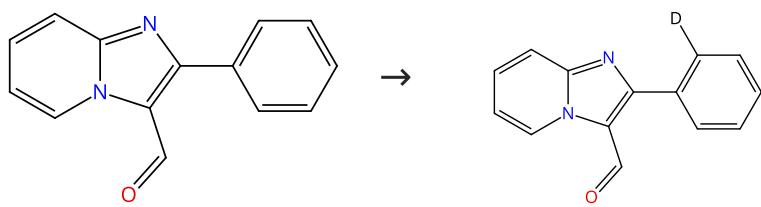
By: Kim, Suho; et al

Asian Journal of Organic Chemistry (2021), 10(11), 3005-3014.

Experimental Protocols

Scheme 27 (1 Reaction)

Steps: 1 Yield: 96%



Suppliers (50)

31-116-CAS-21849485

Steps: 1 Yield: 96%

1.1 Reagents: 2,4,6-Trimethylbenzoic acid, Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*OC-6-11)-hexafluoro antimonate(1-) (1:2); 12 h, 100 °C

Experimental Protocols

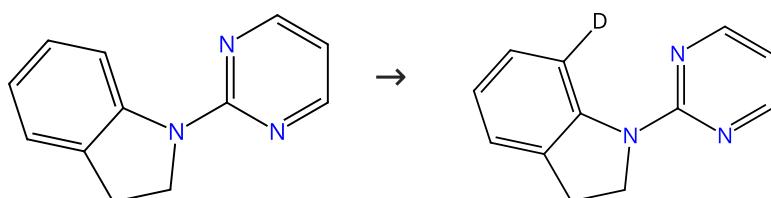
Synthesis of naphtho[1',2':4,5]imidazo[1,2-a]pyridines via Rh(II) I-catalyzed C-H functionalization of 2-arylimidazo[1,2-a]pyridines with cyclic 2-diazo-1,3-diketones featuring with a ring opening and reannulation

By: Li, Bin; et al

Organic Chemistry Frontiers (2020), 7(7), 919-925.

Scheme 28 (2 Reactions)

Steps: 1 Yield: 95%



Suppliers (10)

31-614-CAS-31909782

Steps: 1 Yield: 95%

1.1 Reagents: Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*OC-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: Toluene; 12 h, 120 °C

Experimental Protocols

Ruthenium-Catalyzed C7-Formylmethylation or Sequential Acetalization of Indolines with Vinylene Carbonate in Different Solvents

By: Liu, Min; et al

Advanced Synthesis & Catalysis (2022), 364(9), 1580-1586.

31-614-CAS-38854885

Steps: 1

1.1 Reagents: Sodium carbonate, Carbon monoxide, Methanol-*d*₄, Copper bromide (CuBr)
Catalysts: Rhodium trichloride
Solvents: Toluene; 8 h, 130 °C

Experimental Protocols

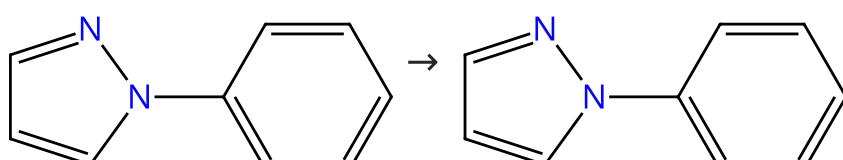
Directing group assisted rhodium-catalyzed formal C-H arylation and carbonylative arylation of arenes with aryl halides in the presence of CO

By: Teng, Houyun; et al

Journal of Catalysis (2024), 429, 115234.

Scheme 29 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (90)

31-614-CAS-35237162

Steps: 1 Yield: 95%

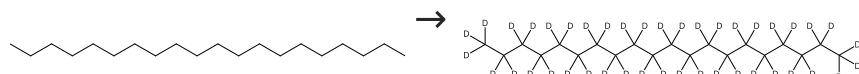
1.1 Reagents: Cupric acetate, Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 6 h, rt**Chelation-Assisted Rhodium-Catalyzed Alkylation of 1-Arylpyrazole C-H Bond with Cyclopropanols**

By: Ramachandran, Kuppan; et al

Synlett (2023), 34(7), 868-872.

Scheme 30 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (93)

Suppliers (32)

31-116-CAS-9988804

Steps: 1 Yield: 95%

1.1 Reagents: Water-*d*₂

Catalysts: Platinum, Rhodium

Solvents: 2-Propan-1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C**Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system**

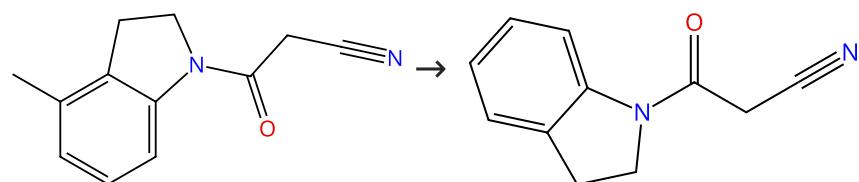
By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Experimental Protocols

Scheme 31 (1 Reaction)

Steps: 1 Yield: 95%



31-614-CAS-29698987

Steps: 1 Yield: 95%

1.1 Reagents: Sodium acetate

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Dimethylformamide, Methanol-*d*; 1 h, 80 °C**Rh(III)-Catalyzed Carbocyclization of 3-(Indolin-1-yl)-3-oxopropanenitriles with Alkynes and Alkenes through C-H Activation**

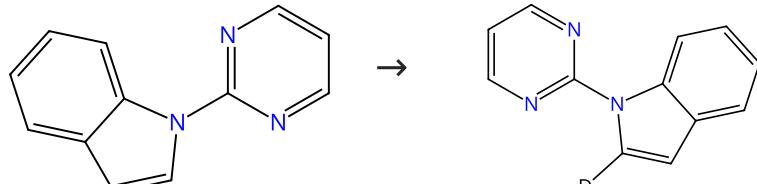
By: Zhou, Tao; et al

Organic Letters (2016), 18(19), 5066-5069.

Experimental Protocols

Scheme 32 (2 Reactions)

Steps: 1 Yield: 95%



Suppliers (59)

Suppliers (3)

31-116-CAS-20328308

Steps: 1 Yield: 95%

1.1 Reagents: Cupric acetate, Methanol-*d*₄

Catalysts: Rhodium trichloride trihydrate

Solvents: Dimethylformamide; 10 h, 90 °C

RhCl₃·3H₂O-Catalyzed Regioselective C(sp²)-H Alkoxy carbonylation: Efficient Synthesis of Indole- and Pyrrole-2-carboxylic Acid Esters

By: Zhao, Kang; et al

ACS Catalysis (2019), 9(6), 5545-5551.

31-614-CAS-23952974

Steps: 1

Rhodium-Catalyzed Direct C-H Alkenylation of Indoles with Alkenyl Borates

By: Wang, Ze-Tian; et al

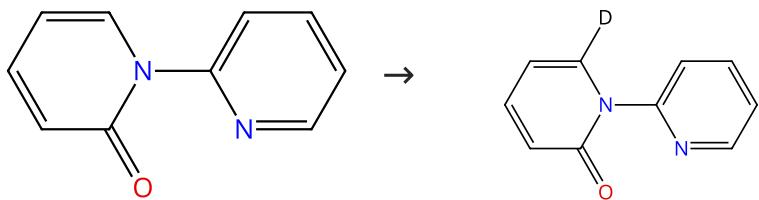
Chinese Journal of Chemistry (2021), 39(10), 2823-2828.

- 1.1 Reagents:** Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol; 4 h, 60 °C

Experimental Protocols

Scheme 33 (2 Reactions)

Steps: 1 Yield: 46-95%



Suppliers (8)

31-116-CAS-23740502

Steps: 1 Yield: 95%

Rhodium(III)-Catalyzed C-H Bond Functionalization of 2-Pyridones with Alkynes: Switchable Alkenylation, Alkenylation/Directing Group Migration and Rollover Annulation

By: Xu, Xin; et al

Chemistry - A European Journal (2021), 27(34), 8811-8821.

- 1.1 Reagents:** Acetic acid, Methanol-*d*₄
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Ethanol; rt; 12 h, 130 °C

Experimental Protocols

31-614-CAS-36905119

Steps: 1 Yield: 46%

Rh^{III}-promoted directed C-H N-heteroarylation of 2-pyridones

By: Chi, Rong; et al

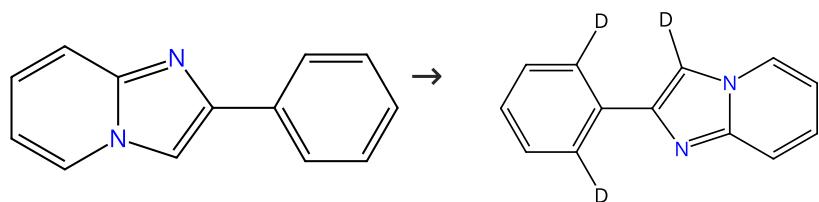
Organic & Biomolecular Chemistry (2023), 21(25), 5288-5296.

- 1.1 Reagents:** Methanol-*d*₄, Lithium fluoride, Silver oxide (Ag₂O)
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: Chlorobenzene; 16 h, 110 °C

Experimental Protocols

Scheme 34 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (83)

31-116-CAS-22912038

Steps: 1 Yield: 95%

Synthesis of maleimide fused benzocarbazoles and imidazo[1,2-a]pyridines via rhodium(III)-catalyzed [4+2] oxidative cycloaddition

By: Li, Bin; et al

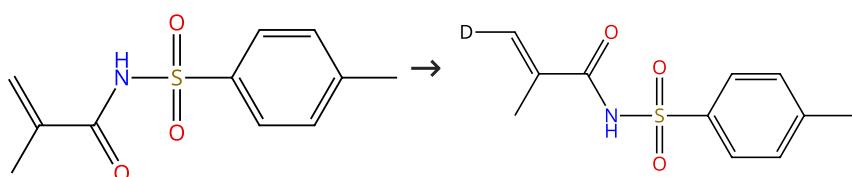
Organic Chemistry Frontiers (2020), 7(22), 3698-3704.

- 1.1 Reagents:** Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 2 h, 100 °C

Experimental Protocols

Scheme 35 (1 Reaction)

Steps: 1 Yield: 95%



Suppliers (4)

31-116-CAS-23547522

Steps: 1 Yield: 95%

1.1 **Reagents:** Methanol-*d*, Tetrabutylammonium acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 12 h, rt

Experimental Protocols

Divergent rhodium-catalyzed electrochemical vinylic C-H annulation of acrylamides with alkynes

By: Xing, Yi-Kang; et al

Nature Communications (2021), 12(1), 930.

Scheme 36 (1 Reaction)

Steps: 1 Yield: 94%



31-116-CAS-16912855

Steps: 1 Yield: 94%

1.1 **Catalysts:** Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Acetic acid-*d*₄, Methanol-*d*; 5 h, 100 °C

Experimental Protocols

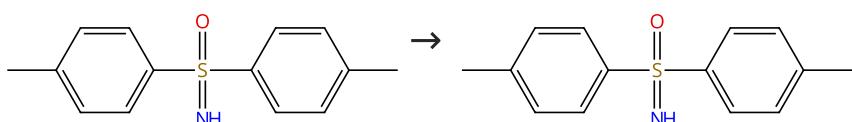
N-Doped Cationic PAHs by Rh(III)-Catalyzed Double C-H Activation and Annulation of 2-Arylbenzimidazoles with Alkynes

By: Villar, Jose M.; et al

Organic Letters (2017), 19(7), 1702-1705.

Scheme 37 (2 Reactions)

Steps: 1 Yield: 94%



Suppliers (2)

31-614-CAS-43024808

Steps: 1 Yield: 94%

1.1 **Reagents:** Pivalic acid, Water-*d*₂
Catalysts: Silver triflate, Rhodium, di-μ-iododiiodobis[(3a,4,5,6,6a-η)-(13b-*R*)-4,5,6-trimethyl-3a-*H*-cyclopenta[*b*]dinaphtho[2,1-*e*:1',2'-*g*][1,4]dioxocin-3a-yl]di-
Solvents: Methanol-*d*₄; 6 - 8 h, rt

Experimental Protocols

Chiral Cp^XRh^{III}-catalyzed enantioselective C-H annulation to access fused tricyclic sulfur-stereogenic and medium-sized aza-heterocycles

By: Xiong, Yuping; et al

Organic Chemistry Frontiers (2025), 12(2), 614-622.

31-614-CAS-38217266

Steps: 1

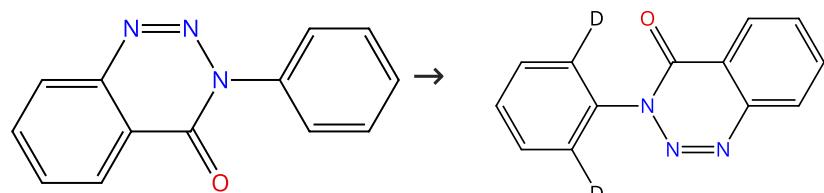
1.1 Reagents: Methanol-*d*₄, 1-Adamantanecarboxylic acid, Tricyclo[3.3.1.1^{3,7}]decane-1-carboxylic acid, copper(2+) salt (2:1)
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 24 h, 80 °C

Experimental Protocols

Rh(III)-catalyzed redox-neutral C-H [4 + 1] annulation of sulfox imines with α,α -difluoromethylene alkynes: diastereoselective synthesis of E-monofluoroalkenyl benzoisothiazole 1-oxides
By: Wang, Ting; et al
Organic Chemistry Frontiers (2023), 10(23), 5916-5922.

Scheme 38 (1 Reaction)

Steps: 1 Yield: 94%



Suppliers (11)

31-614-CAS-37134404

Steps: 1 Yield: 94%

1.1 Reagents: Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Tetrahydrofuran; 12 h, 60 °C

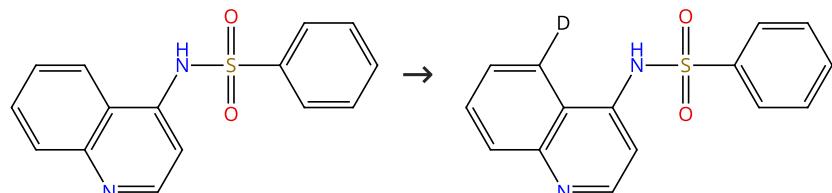
Experimental Protocols

Rh(III)-Catalyzed Dienylation and Cyclopropylation of 1,2,3-Benzotriazinones with Alkylidenecyclopropanes

By: Liu, Yan-Zhi; et al
Organic Letters (2023), 25(28), 5179-5184.

Scheme 39 (1 Reaction)

Steps: 1 Yield: 94%



Suppliers (4)

31-116-CAS-21786934

Steps: 1 Yield: 94%

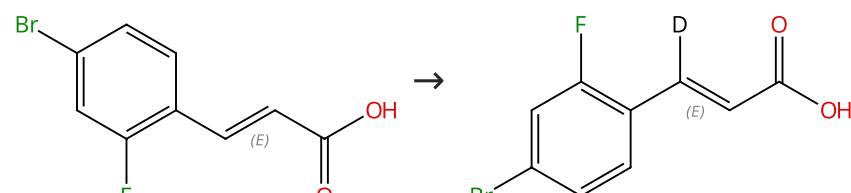
1.1 Reagents: Cupric acetate, Methanol-*d*₄, Oxygen
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; rt → 120 °C; 12 h, 120 °C

Rhodium(III)-Catalyzed Oxidative Annulation of 4-Aminoquinolines and Acrylate through Two Consecutive C(sp²)-H Activations

By: Liu, Jian; et al
Organic Letters (2020), 22(7), 2657-2662.

Scheme 40 (1 Reaction)

Steps: 1 Yield: 94%



Double bond geometry shown

Double bond geometry shown

Suppliers (34)

31-116-CAS-20659798

Steps: 1 Yield: 94%

- 1.1 **Reagents:** Sodium acetate, Oxygen, Water- *d*₂
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoroantimonate(1-) (1:2)
Solvents: Methanol- *d*₄; 24 h, 90 °C
- 1.2 **Reagents:** Hydrochloric acid
Solvents: Dichloromethane, Water; 15 min

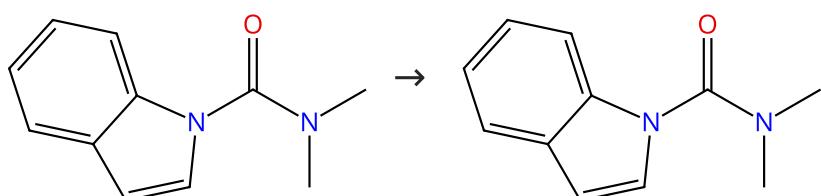
A Protocol for the Ortho-Deuteration of Acidic Aromatic Compounds in D₂O Catalyzed by Cationic Rh^{III}

By: Garreau, Alyssa L.; et al

Organic Letters (2019), 21(17), 7044-7048.

Scheme 41 (1 Reaction)

Steps: 1 Yield: 94%



Suppliers (5)

31-614-CAS-34096187

Steps: 1 Yield: 94%

- 1.1 **Reagents:** Cupric acetate, Methanol- *d*₄
Catalysts: Bis[dichloro[η ⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 5 h, rt

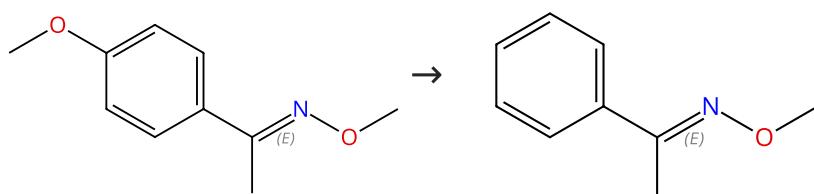
Rhodium-Catalyzed C2-Alkylation of Indoles with Cyclopropanols Using N,N-Dialkylcarbamoyl as a Traceless Directing Group

By: Ramachandran, Kuppan; et al

Organic Letters (2022), 24(37), 6745-6749.

Scheme 42 (1 Reaction)

Steps: 1 Yield: 94%



Double bond geometry shown

Double bond geometry shown

Suppliers (3)

31-614-CAS-30067575

Steps: 1 Yield: 94%

- 1.1 **Reagents:** Methanol- *d*₄
Catalysts: Bis[dichloro[η ⁵-(pentamethylcyclopentadienyl)]rhodium], Propanoic acid, 2,2-dimethyl-, potassium salt (1:1), Silver hexafluoroantimonate
Solvents: 2,2,2-Trifluoroethanol; 12 h, 10 °C

Rhodium(III)-Catalyzed C-H Alkylation/Nucleophilic Addition Domino Reaction

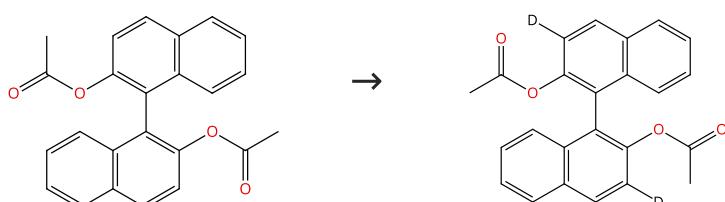
By: Tang, Mengyao; et al

European Journal of Organic Chemistry (2019), 2019(4), 660-664.

Experimental Protocols

Scheme 43 (1 Reaction)

Steps: 1 Yield: 93%



Suppliers (16)

31-116-CAS-22402555

Steps: 1 Yield: 93%

1.1 Reagents: Methanol-*d*₄, Copper diacetate monohydrate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 2 h, 160 °C

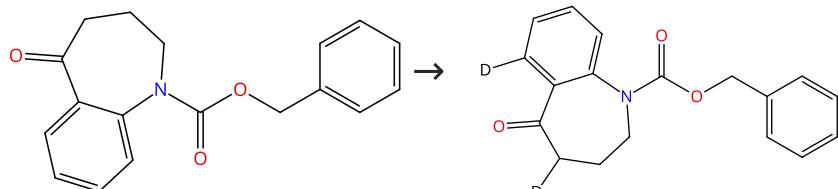
Rapid Synthesis of Alkenylated BINOL Derivatives via Rh(III)-Catalyzed C-H Bond Activation

By: Liu, Hao; et al

Organic Letters (2020), 22(12), 4648-4652.

Scheme 44 (1 Reaction)

Steps: 1 Yield: 93%



Suppliers (24)

31-116-CAS-18574792

Steps: 1 Yield: 93%

1.1 Reagents: 2-Nitrobenzoic acid, Carbon monoxide, Sodium sulfate
Catalysts: Tris[4-(trifluoromethyl)phenyl]phosphine, Rhodium (1+), bis[(1,2,5,6-η)-1,5-cyclooctadiene]-, 1,1,1-trifluoro methanesulfonate (1:1)
Solvents: Benzonitrile; 10 min; 10 s

1.2 Reagents: Methanol-*d*₄; 72 h, 1 atm, 130 °C

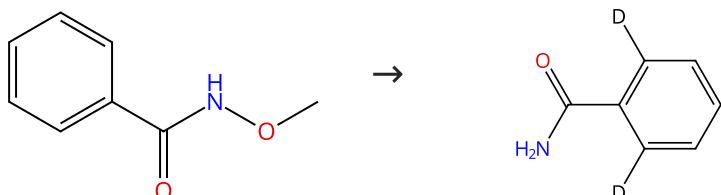
Modular Access to Azepines by Directed Carbonylative C-C Bond Activation of Aminocyclopropanes

By: Wang, Gang-Wei; et al

Journal of the American Chemical Society (2018), 140(8), 2743-2747.

Scheme 45 (1 Reaction)

Steps: 1 Yield: 93%



Suppliers (49)

31-614-CAS-42033315

Steps: 1 Yield: 93%

1.1 Reagents: Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Tetrahydrofuran; 16 h, 65 °C

Synthesis of 3-Methyleneisoindolin-1-ones via Rhodium(III)-Catalyzed C-H/N-H Activation and Annulation of N-Methoxybenzamides with Potassium Vinyltrifluoroborate

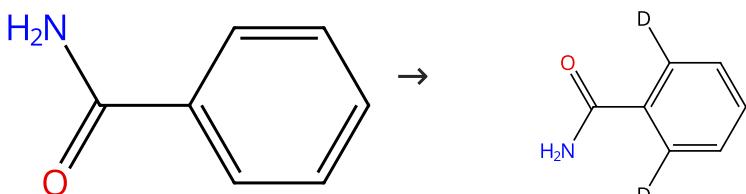
By: Kumar, Vikash; et al

Chemistry - An Asian Journal (2024), 19(22), e202400718.

Experimental Protocols

Scheme 46 (1 Reaction)

Steps: 1 Yield: 93%



Suppliers (115)

31-116-CAS-15352860

Steps: 1 Yield: 93%

1.1 Reagents: Cesium acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-d₄; 16 h, 60 °C

Experimental Protocols

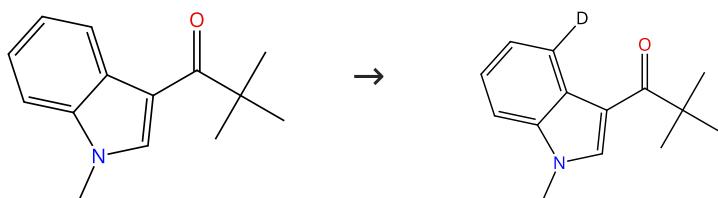
Rhodium(III)-Catalyzed Isoquinolone Synthesis: The N-O Bond as a Handle for C-N Bond Formation and Catalyst Turnover

By: Guimond, Nicolas; et al

Journal of the American Chemical Society (2010), 132(20), 6908-6909.

Scheme 47 (1 Reaction)

Steps: 1 Yield: 92%



Suppliers (32)

31-614-CAS-33033742

Steps: 1 Yield: 92%

1.1 Reagents: Cupric acetate, Methanol-d₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Dichloromethane; 0.5 h, 80 °C

Experimental Protocols

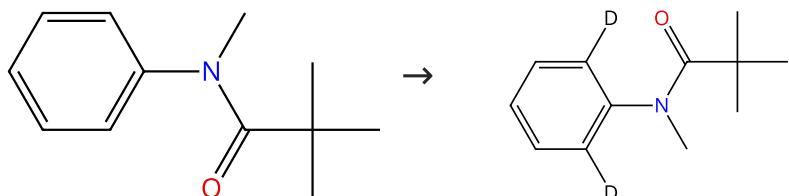
Rh(III)-Catalyzed dienylation and cycloproylation of indoles at the C4 position with alkylidenecyclopropanes

By: Liu, Yan-Zhi; et al

Organic Chemistry Frontiers (2022), 9(16), 4287-4293.

Scheme 48 (1 Reaction)

Steps: 1 Yield: 92%



Suppliers (7)

31-116-CAS-21502393

Steps: 1 Yield: 92%

1.1 Reagents: Methanol-d₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Propanoic acid, 2-methyl-, silver(1+) salt (1:1), [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamide-silver

Solvents: 1,2-Dichloroethane; 10 h, 60 °C

Experimental Protocols

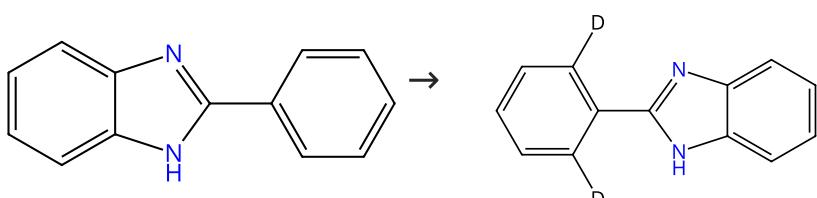
Rhodium(III)-Catalyzed Directed C-H Bond Naphthylation with 7-Azabenzonorbornadiene as the Naphthylating Reagent

By: Li, Honghe; et al

Asian Journal of Organic Chemistry (2020), 9(2), 233-237.

Scheme 49 (1 Reaction)

Steps: 1 Yield: 92%



31-614-CAS-36276981

Steps: 1 Yield: 92%

1.1 Reagents: Methanol-*d*₄, Cesium acetate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,1,1,3,3-Hexafluoro-2-propanol; 4 h, 50 °C

Experimental Protocols

Synthesis of mono-fluorinated heterocycles with a ring-junction nitrogen atom via Rh(iii)-catalyzed CF₃-carbenoid C-H functionalization and defluorinative annulation

By: Li, Haosheng; et al

Organic Chemistry Frontiers (2023), 10(6), 1544-1550.

Scheme 50 (1 Reaction)

Steps: 1 Yield: 92%



Suppliers (96)

Suppliers (32)

31-116-CAS-10326577

Steps: 1 Yield: 92%

1.1 Reagents: Water-*d*₂
Catalysts: Platinum, Rhodium
Solvents: 2-Propan-1,1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C

Experimental Protocols

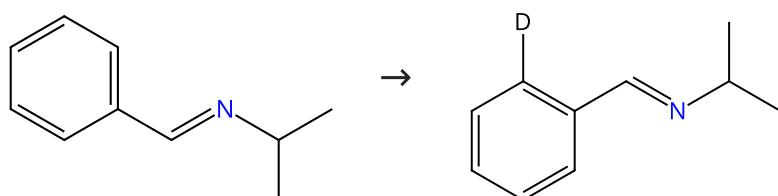
Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 51 (1 Reaction)

Steps: 1 Yield: 92%



Suppliers (23)

31-116-CAS-9341077

Steps: 1 Yield: 92%

1.1 Reagents: Sodium acetate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Propanoic acid-*d*, 2,2-dimethyl-*d*₂
Solvents: Methanol-*d*₄; 4 d, rt

Experimental Protocols

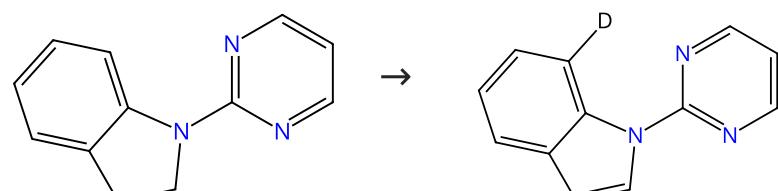
Metal control of selectivity in acetate-assisted C-H bond activation: an experimental and computational study of heterocyclic, vinylic and phenylic C(sp²)-H bonds at Ir and Rh

By: Carr, Kevin J. T.; et al

Chemical Science (2014), 5(6), 2340-2346.

Scheme 52 (1 Reaction)

Steps: 1 Yield: 91%



Suppliers (10)

31-116-CAS-20540908

Steps: 1 Yield: 91%

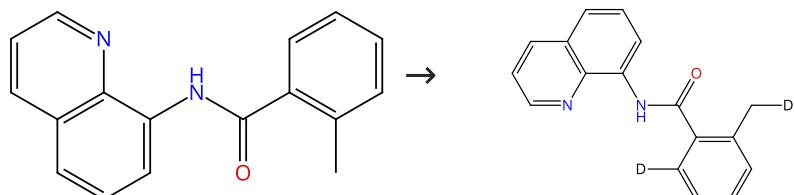
RhCl₃·3H₂O-Catalyzed C7-Selective C-H Carbonylation of Indolines with CO and Alcohols

By: Du, Rongrong; et al

Organic Letters (2019), 21(16), 6418-6422.

Scheme 53 (1 Reaction)

Steps: 1 Yield: 91%



Suppliers (4)

31-614-CAS-39689526

Steps: 1 Yield: 91%

Rhodium-catalysed additive-free carbonylation of benzamides with diethyl dicarbonate as a carbonyl source

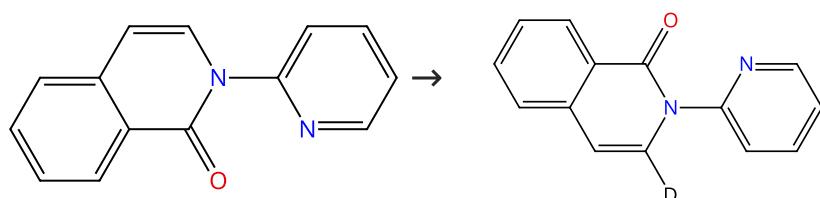
By: Suzuki, Hirotugu; et al

Organic & Biomolecular Chemistry (2024), 22(14), 2744-2748.

Experimental Protocols

Scheme 54 (1 Reaction)

Steps: 1 Yield: 91%



Supplier (1)

31-116-CAS-23008718

Steps: 1 Yield: 91%

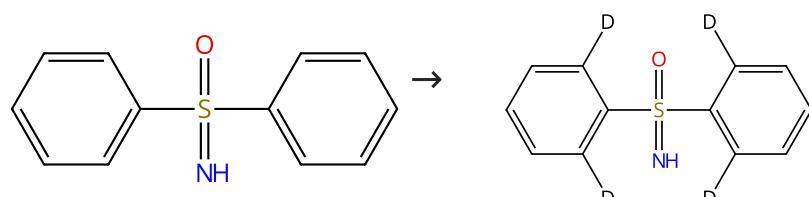
Rh(III)-Catalyzed acylation of heteroarenes with cyclobutanones via C-H/C-C bond activation

By: Cui, Yixin; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(100), 15631-15634.

Scheme 55 (1 Reaction)

Steps: 1 Yield: 91%



Suppliers (46)

31-116-CAS-20606817

Steps: 1 Yield: 91%

1.1 Reagents: Sodium acetate, Cupric acetate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Toluene, Methanol-*d*₄; 1 h, 100 °C

Experimental Protocols

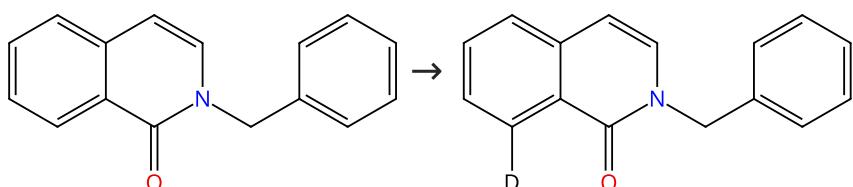
Rhodium(III)-catalyzed tandem annulation reaction to build polycyclic benzothiazine derivatives

By: Li, Yang; et al

Organic Chemistry Frontiers (2019), 6(14), 2457-2461.

Scheme 56 (1 Reaction)

Steps: 1 Yield: 91%



Suppliers (4)

31-614-CAS-41397882

Steps: 1 Yield: 91%

1.1 Reagents: Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 3 h, 80 °C

Experimental Protocols

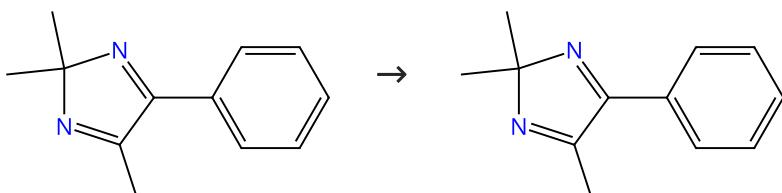
Rh(III)-catalyzed regioselective C(sp²)-H alkenylation of isoquinolones with methoxyallene: A facile access to aldehyde-bearing isoquinolones

By: Thakur, Ankita; et al

Organic & Biomolecular Chemistry (2024), 22(32), 6612-6616.

Scheme 57 (1 Reaction)

Steps: 1 Yield: 91%



31-614-CAS-34268293

Steps: 1 Yield: 91%

1.1 Reagents: Zinc acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 2 h, 70 °C

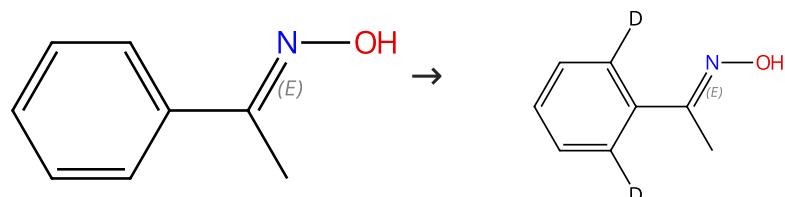
Formation of Fluorovinyl Spiro-[imidazole-indene] and α-Amino-β-naphthalenones via Rh(III)-Catalyzed Cascade C-H Functionalization

By: Luo, Yi; et al

Organic Letters (2022), 24(38), 6940-6944.

Scheme 58 (1 Reaction)

Steps: 1 Yield: 90%



Double bond geometry shown

Double bond geometry shown

Suppliers (16)

31-116-CAS-23639959

Steps: 1 Yield: 90%

1.1 Reagents: Methanol-*d*₄, Pivalic anhydride, Silver hexafluoro antimonate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)] rhodium]
Solvents: 1,2-Dichloroethane; 10 h, rt → 80 °C

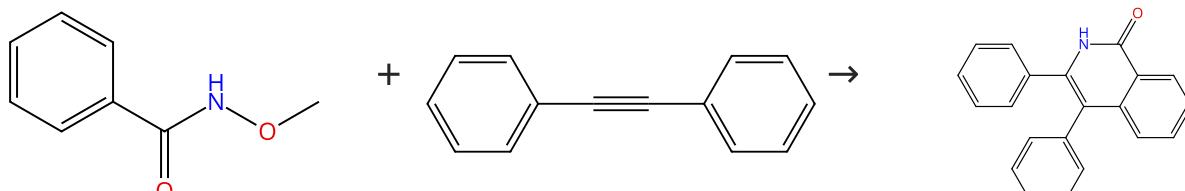
Experimental Protocols

Intermolecular Amination of Ketoximes with Anthranils by Rh-Catalyzed C-H Bond Activation in Air

By: Chen, Weiqiang; et al

Asian Journal of Organic Chemistry (2021), 10(4), 838-844.

Scheme 59 (1 Reaction)



Suppliers (49)

Suppliers (88)

Suppliers (3)

31-614-CAS-28438120

Steps: 1 Yield: 90%

1.1 Reagents: Cesium acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)] rhodium]
Solvents: Methanol-*d*₄; 16 h, 60 °C

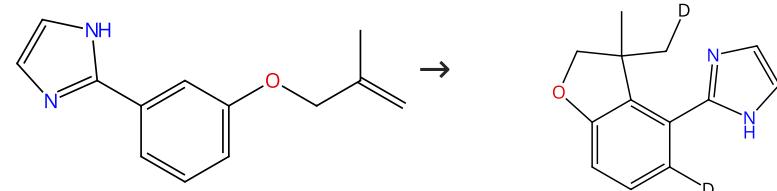
Experimental Protocols

Rhodium(III)-Catalyzed Heterocycle Synthesis Using an Internal Oxidant: Improved Reactivity and Mechanistic Studies

By: Guimond, Nicolas; et al

Journal of the American Chemical Society (2011), 133(16), 6449-6457.

Scheme 60 (1 Reaction)



Steps: 1 Yield: 90%

31-614-CAS-36906792

Steps: 1 Yield: 90%

1.1 Reagents: Methanol-*d*₄, Cesium acetate, Water-*d*₂
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)] rhodium]; 3 h, 60 °C

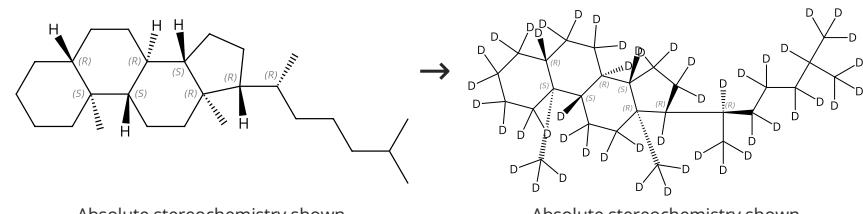
Experimental Protocols

Intramolecular Hydroarylation of Arenes via Imidazole-Directed C-H Activation in Aqueous Methanol Using Rhodium(III) as the Catalyst and Mechanistic Study

By: Sinha, Nilotpal; et al

Journal of Organic Chemistry (2023), 88(13), 8969-8983.

Scheme 61 (1 Reaction)



Absolute stereochemistry shown

Steps: 1 Yield: 90%

Suppliers (61)

31-614-CAS-26108852

Steps: 1 Yield: 90%

1.1 Reagents: Water-*d*₂

Catalysts: Platinum, Rhodium

Solvents: Cyclohexane, 2-Propan-1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C

Experimental Protocols

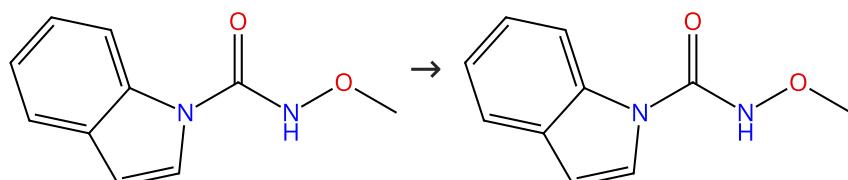
Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 62 (3 Reactions)

Steps: 1 Yield: 89%



Supplier (1)

31-614-CAS-29222362

Steps: 1 Yield: 89%

1.1 Reagents: Methanol-*d*₄, Dipotassium phosphateCatalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Dichloromethane; 24 h, 80 °C

Experimental Protocols

Selective Synthesis of Fused Tricyclic [1, 3]Oxazino[3,4-*a*]indolones and Dihydropyrimido[1,6-*a*]indolones via Rh(III)-catalyzed [3+3] or [4+2] C-H Annulation

By: Chen, Junyu; et al

Advanced Synthesis & Catalysis (2021), 363(2), 446-452.

31-614-CAS-37084964

Steps: 1

1.1 Reagents: Pivalic acid, Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 1 h, 100 °C

Experimental Protocols

Rh(III)-catalyzed C-H activation/annulation of N-carbamoyl lindoles with CF₃-imidoyl sulfoxonium ylides for the divergent synthesis of trifluoromethyl-substituted (dihydro)pyrimidoindolones

By: Duan, Yubo; et al

Organic Chemistry Frontiers (2023), 10(15), 3843-3848.

31-614-CAS-29616189

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 4 h, 40 °C

Experimental Protocols

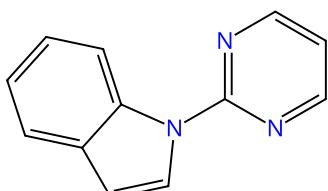
Additive-Controlled Divergent Synthesis of Tetrasubstituted 1,3-Enynes and Alkynylated 3H-Pyrrolo[1,2-*a*]indol-3-ones via Rhodium Catalysis

By: Zhao, Fei; et al

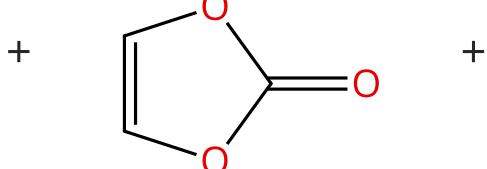
Organic Letters (2021), 23(3), 727-733.

Scheme 63 (1 Reaction)

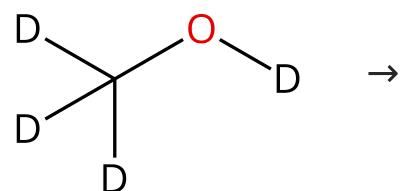
Steps: 1 Yield: 89%



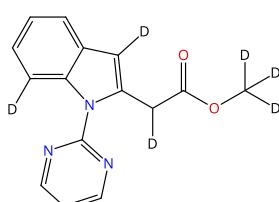
Suppliers (59)



Suppliers (74)



Suppliers (248)



31-614-CAS-32272018

Steps: 1 Yield: 89%

1.1 Reagents: Benzoic acid

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Toluene; 20 h, 80 °C

Experimental Protocols

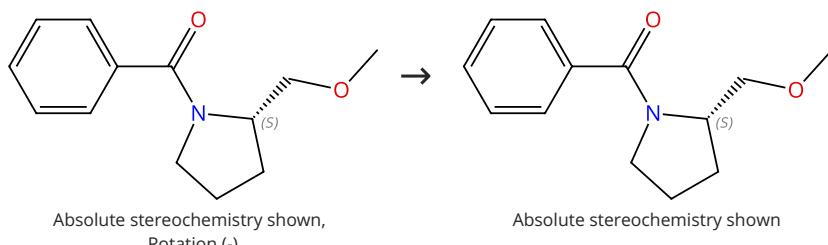
Rh(III)-Catalyzed three-component C-H functionalization reaction with vinylene carbonate: Late-stage C-H esterification of indole derivatives

By: Li, Bin-Shi; et al

Tetrahedron Letters (2022), 99, 153854.

Scheme 64 (1 Reaction)

Steps: 1 Yield: 89%



31-614-CAS-24484042

Steps: 1 Yield: 89%

1.1 Reagents: Methanol-*d*₄Catalysts: Cupric acetate, Aluminum *tert*-butoxide, Bis [dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Dichloromethane; 48 h, 100 °C

Experimental Protocols

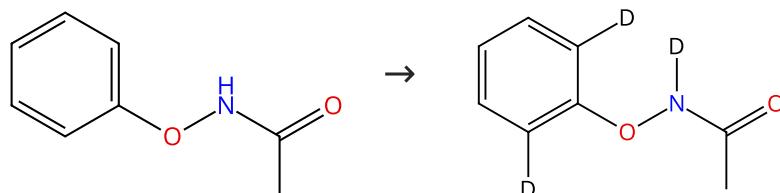
Chiral-Directing-Group-Assisted Rhodium(III)-Catalyzed Asymmetric Addition of Inert Arene C-H Bond to Aldimines with Subsequent Intramolecular Cyclization

By: Cai, Xuhong; et al

Chemistry - A European Journal (2021), 27(67), 16611-16615.

Scheme 65 (1 Reaction)

Steps: 1 Yield: 89%



Suppliers (11)

31-116-CAS-12346889

Steps: 1 Yield: 89%

1.1 Reagents: Ethanol-*d*, Cesium acetateCatalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 2 h, 50 °C

Experimental Protocols

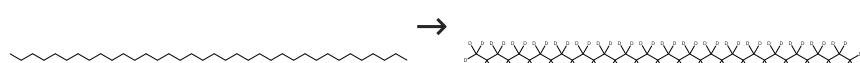
Rhodium(III)-Catalyzed C-H Olefination for the Synthesis of ortho-Alkenyl Phenols Using an Oxidizing Directing Group

By: Shen, Yangyang; et al

Organic Letters (2013), 15(13), 3366-3369.

Scheme 66 (1 Reaction)

Steps: 1 Yield: 89%



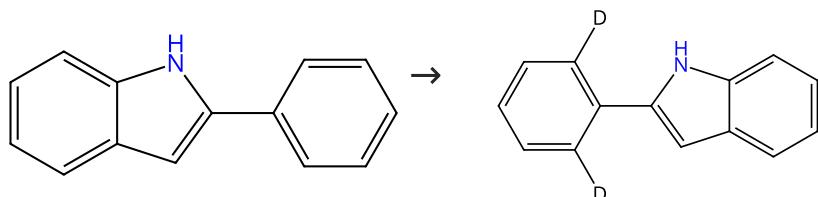
Suppliers (81)

Suppliers (34)

31-116-CAS-5392283	Steps: 1 Yield: 89%	Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system By: Yamada, Tsuyoshi; et al RSC Advances (2015), 5(18), 13727-13732.
1.1 Reagents: Water- <i>d</i> ₂ Catalysts: Platinum, Rhodium Solvents: 2-Propan-1,1,1,2,3,3,3- <i>d</i> ₇ -ol- <i>d</i> ; 24 h, 120 °C Experimental Protocols		

Scheme 67 (3 Reactions)

Steps: 1 Yield: 88-89%



Suppliers (88)

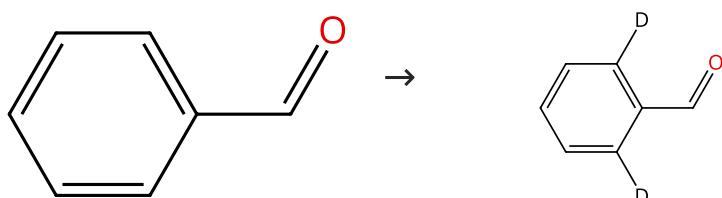
31-614-CAS-36276977	Steps: 1 Yield: 89%	Synthesis of mono-fluorinated heterocycles with a ring-junction nitrogen atom via Rh(III)-catalyzed CF ₃ -carbenoid C-H functionalization and defluorinative annulation By: Li, Haosheng; et al Organic Chemistry Frontiers (2023), 10(6), 1544-1550.
1.1 Reagents: Methanol- <i>d</i> ₄ , Cesium acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,1,1,3,3,3-Hexafluoro-2-propanol; 24 h, 100 °C Experimental Protocols		

31-116-CAS-22279857	Steps: 1 Yield: 88%	Construction of Bridged Carbocycles and Heterocycles via Rh(III)-Catalyzed C-H Alkylation/Michael Addition of 2-Arylindoles with Quinone Monoacetals By: Guo, Shanghai; et al Journal of Organic Chemistry (2020), 85(14), 8910-8922.
1.1 Reagents: Methanol- <i>d</i> ₄ , Cesium acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: (Trifluoromethyl)benzene; 21 h, 70 °C Experimental Protocols		

31-614-CAS-31997366	Steps: 1	The solvent-controlled Rh(III)-catalyzed switchable [4+2] annulation of 2-arylindoles with iodonium ylides By: Nunewar, Saiprasad; et al Chemical Communications (Cambridge, United Kingdom) (2022), 58(41), 6140-6143.
1.1 Reagents: Sodium bicarbonate, Methanol- <i>d</i> ₄ , Cesium acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Dichloromethane; 6 h, 55 °C Experimental Protocols		

Scheme 68 (1 Reaction)

Steps: 1 Yield: 88%

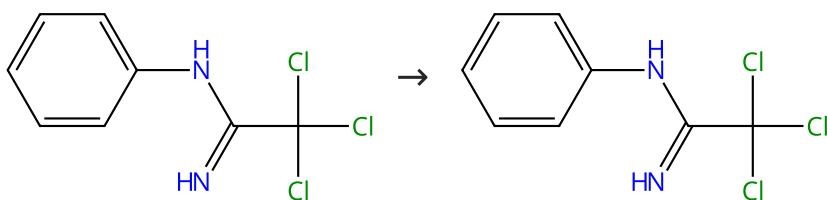


Suppliers (80)

31-116-CAS-23016834	Steps: 1 Yield: 88%	Controllable Tandem [3+2] Cyclization of Aromatic Aldehydes with Maleimides: Rhodium(III)-Catalyzed Divergent Synthesis of Indane-Fused Pyrrolidine-2,5-dione By: Li, Xin-Ran; et al Organic Letters (2020), 22(22), 8808-8813.
1.1 Reagents: Oxygen, 2,2,2-Trifluoroethan-1,1- <i>d</i> ₂ -ol- <i>d</i> ₂ Catalysts: Cobalt diacetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamido-κO]silver; 24 h, 100 °C Experimental Protocols		

Scheme 69 (1 Reaction)

Steps: 1 Yield: 88%



Suppliers (9)

31-614-CAS-24972878

Steps: 1 Yield: 88%

1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; 0.5 h, rt

Cp*Rh(III)-Catalyzed Low Temperature C-H Allylation of N-Aryl-trichloro Acetimidamide

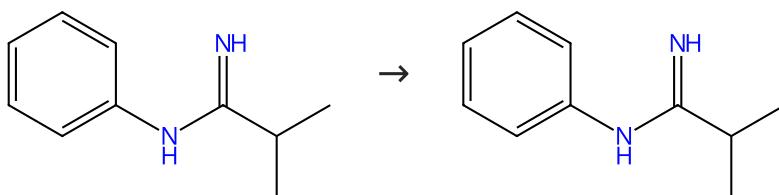
By: Debbarma, Suvankar; et al

Journal of Organic Chemistry (2016), 81(23), 11716-11725.

Experimental Protocols

Scheme 70 (1 Reaction)

Steps: 1 Yield: 88%



Suppliers (7)

31-614-CAS-26267474

Steps: 1 Yield: 88%

1.1 Reagents: Sodium bicarbonate

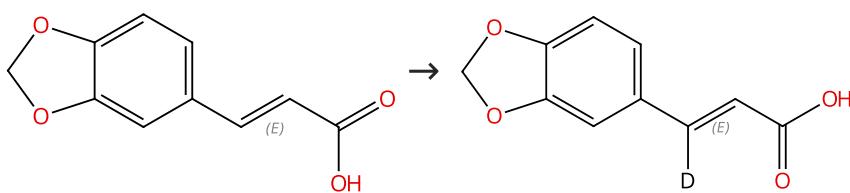
Catalysts: Silver acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*₄; 3 h, 90 °C**Direct Synthesis of 3-Acylindoles through Rhodium(III)-Catalyzed Annulation of N-Phenylamidines with α-Cl Ketones**

By: Zhou, Jianhui; et al

Organic Letters (2018), 20(23), 7645-7649.

Scheme 71 (1 Reaction)

Steps: 1 Yield: 88%



Double bond geometry shown

Double bond geometry shown

Suppliers (63)

31-116-CAS-20659801

Steps: 1 Yield: 88%

1.1 Reagents: Sodium acetate, Oxygen, Water-*d*₂

Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2)

Solvents: Methanol-*d*₄; 24 h, 90 °C

1.2 Reagents: Hydrochloric acid

Solvents: Dichloromethane, Water; 15 min

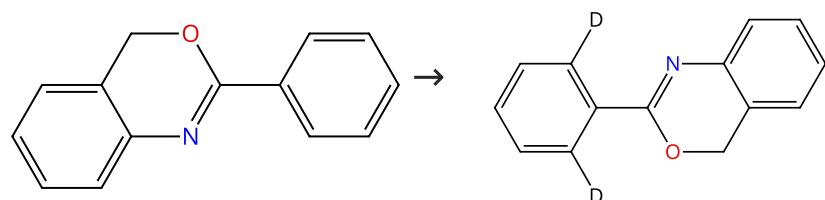
A Protocol for the Ortho-Deuteration of Acidic Aromatic Compounds in D₂O Catalyzed by Cationic Rh^{III}

By: Garreau, Alyssa L.; et al

Organic Letters (2019), 21(17), 7044-7048.

Scheme 72 (1 Reaction)

Steps: 1 Yield: 88%



Suppliers (2)

31-614-CAS-42766069

Steps: 1 Yield: 88%

1.1 Reagents: Manganese diacetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
 Solvents: 2,2,2-Trifluoroethanol; 24 h, 60 °C

Synergistic [4 + 1] Spiroannulation and Selective Ring-Opening Strategy toward γ-Spirolactams

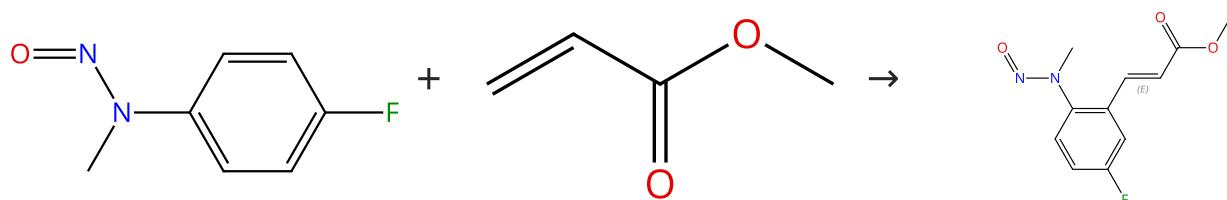
By: Mondal, Imtiaj; et al

Organic Letters (2024), 26(46), 9859-9864.

Experimental Protocols

Scheme 73 (1 Reaction)

Steps: 1 Yield: 88%



Suppliers (22)

Suppliers (66)

Double bond geometry shown

31-177-CAS-14787862

Steps: 1 Yield: 88%

1.1 Reagents: Silver acetate
 Catalysts: Rhodium, (acetato-κO)[5-fluoro-2-[methyl(nitroso-κN)amino]phenyl-κC][(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1)
 Solvents: Methanol, Methanol-*d*₄; 12 h, 35 °C

Rhodium(III)-Catalyzed N-Nitroso-Directed C-H Olefination of Arenes. High-Yield, Versatile Coupling under Mild Conditions

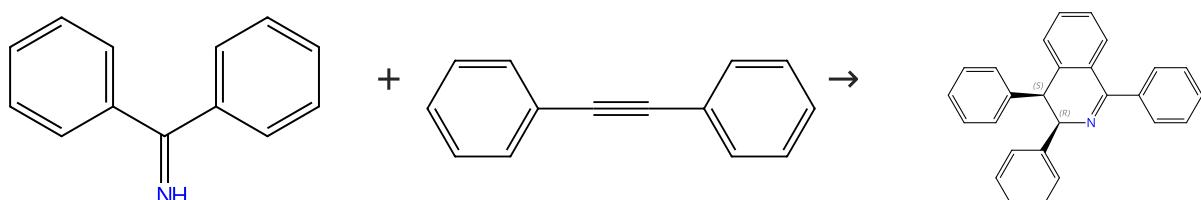
By: Liu, Baoqing; et al

Journal of the American Chemical Society (2013), 135(1), 468-473.

Experimental Protocols

Scheme 74 (1 Reaction)

Steps: 1 Yield: 87%



Suppliers (100)

Suppliers (88)

Relative stereochemistry shown

31-614-CAS-26113413

Steps: 1 Yield: 87%

1.1 Reagents: Methanol-*d*₄
 Catalysts: Rhodium(1+), bis[(1,2,5,6-η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Bis[2-(diphenylphosphino)phenyl]ether
 Solvents: Toluene; 24 h, 100 °C

Merging rhodium-catalysed C-H activation and hydroamination in a highly selective [4+2] imine/alkyne annulation

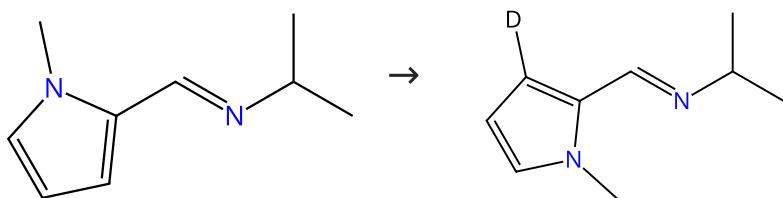
By: Manan, Rajith S.; et al

Nature Communications (2016), 7, 11506pp..

Experimental Protocols

Scheme 75 (1 Reaction)

Steps: 1 Yield: 87%



Supplier (1)

31-116-CAS-11507023

Steps: 1 Yield: 87%

1.1 Reagents: Sodium acetate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-d₄; 3 h, rt

Experimental Protocols

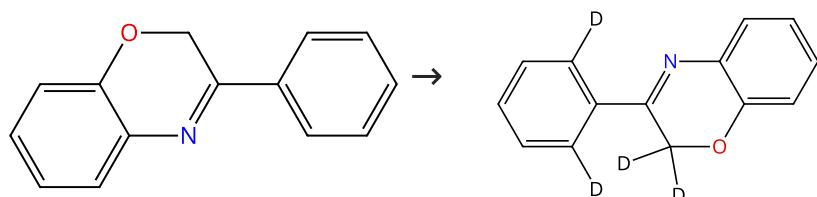
Metal control of selectivity in acetate-assisted C-H bond activation: an experimental and computational study of heterocyclic, vinylic and phenylic C(sp²)-H bonds at Ir and Rh

By: Carr, Kevin J. T.; et al

Chemical Science (2014), 5(6), 2340-2346.

Scheme 76 (1 Reaction)

Steps: 1 Yield: 87%



Suppliers (10)

31-614-CAS-33034654

Steps: 1 Yield: 87%

1.1 Reagents: Sodium acetate, Methanol-d₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethanol; 24 h, 100 °C

Experimental Protocols

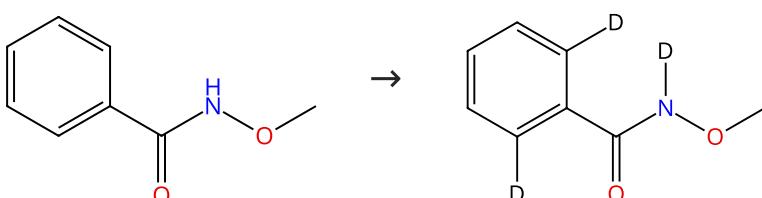
Regio- and Diastereoselective [3 + 2]-Spiroannulation of Benzoxazines with Chalcones: A Rh(III)-Catalyzed Redox-Neutral Approach to α-Aroyl Spiro-Indanamines

By: Sarkar, Writhabrata; et al

Journal of Organic Chemistry (2022), 87(15), 9988-10002.

Scheme 77 (1 Reaction)

Steps: 1 Yield: 87%



Suppliers (49)

31-614-CAS-40980316

Steps: 1 Yield: 87%

1.1 Reagents: Methanol-d₄, Cesium acetate
Catalysts: Tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium(2+)
Solvents: 1,4-Dioxane; 24 h, 60 °C

Experimental Protocols

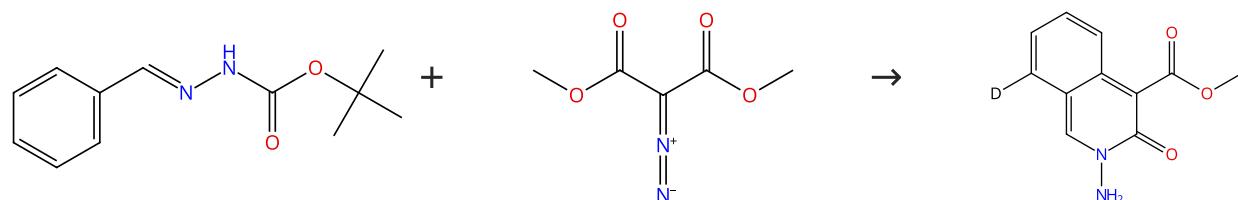
Rh(III)-Catalyzed, Redox-Neutral, C-H Multifluoroalkenylation of Benzamides

By: Lin, Wei; et al

Synthesis (2024), 56(19), 3045-3053.

Scheme 78 (1 Reaction)

Steps: 1 Yield: 87%



Suppliers (49)

Suppliers (30)

31-116-CAS-17609511

Steps: 1 Yield: 87%

1.1 **Catalysts:** Acetic acid-*d*₄, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate**Solvents:** 2,2,2-Trifluoroethan-1,1-*d*₂-ol-*d*; 12 h, 80 °C

Experimental Protocols

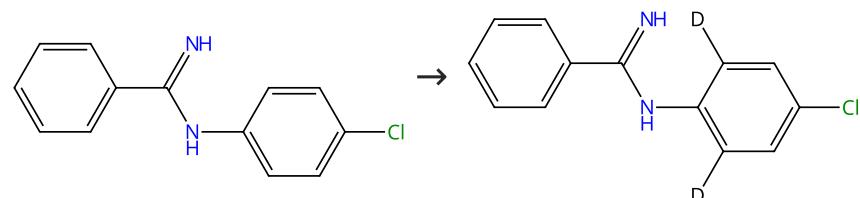
A C-H Activation-Based Strategy for N-Amino Azaheterocycle Synthesis

By: Shi, Pengfei; et al

Organic Letters (2017), 19(16), 4359-4362.

Scheme 79 (1 Reaction)

Steps: 1 Yield: 87%



Suppliers (12)

31-116-CAS-20822307

Steps: 1 Yield: 87%

1.1 **Reagents:** Methanol-*d*₄**Catalysts:** Sodium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver**Solvents:** 1,2-Dichloroethane; 1 h, 120 °C

Experimental Protocols

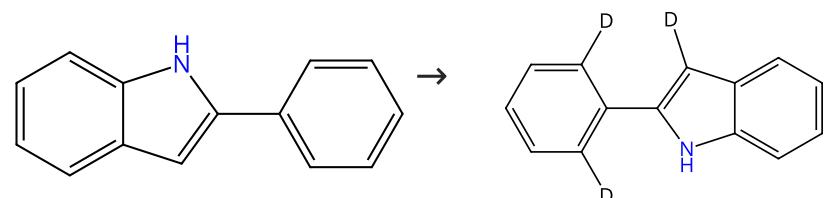
Specific Synthesis of 3H-Indole Derivatives via Rh(III)-Catalyzed Cascade Annulation between N-phenylbenzimidamides and Pyridotriazoles

By: Xu, Hui-Bei; et al

Journal of Organic Chemistry (2019), 84(24), 16286-16292.

Scheme 80 (2 Reactions)

Steps: 1 Yield: 87%



Suppliers (88)

31-116-CAS-22915081

Steps: 1 Yield: 87%

1.1 **Reagents:** Silver acetate, Methanol-*d*₄**Catalysts:** Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]**Solvents:** 1,2-Dichloroethane; 2 h, 100 °C

Experimental Protocols

Synthesis of maleimide fused benzocarbazoles and imidazo[1,2-*a*]pyridines via rhodium(III)-catalyzed [4+2] oxidative cycloaddition

By: Li, Bin; et al

Organic Chemistry Frontiers (2020), 7(22), 3698-3704.

31-116-CAS-23896169

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*4
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Acetonitrile; 12 h, 60 °C

Experimental Protocols

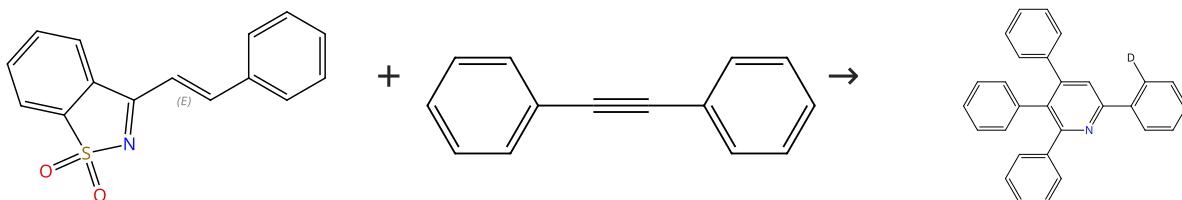
Synthesis of Indolo[2,1-a]benzazepinones through Rhodium-Catalyzed Cascade Reactions of 2-Arylindoles with Allyl Alcohols

By: Wang, Yu-Jiao; et al

Organic Letters (2021), 23(16), 6272-6277.

Scheme 81 (1 Reaction)

Steps: 1 Yield: 86%



Double bond geometry shown

Suppliers (88)

31-227-CAS-1995033

Steps: 1 Yield: 86%

1.1 Reagents: Methanol-*d*4, Silver tetrafluoroborate
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 12 h, 60 °C; 60 °C → rt

1.2 Reagents: Potassium carbonate
Solvents: Water; neutralized, rt

Experimental Protocols

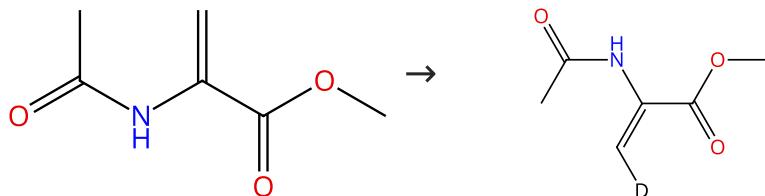
Highly functionalized pyridines synthesis from N-sulfonyl ketimines and alkynes using the N-S bond as an internal oxidant

By: Zhang, Qian-Ru; et al

Organic Letters (2014), 16(6), 1684-1687.

Scheme 82 (1 Reaction)

Steps: 1 Yield: 86%



Suppliers (85)

31-614-CAS-37121046

Steps: 1 Yield: 86%

1.1 Reagents: Sodium acetate
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*, 15 h, 70 °C

Experimental Protocols

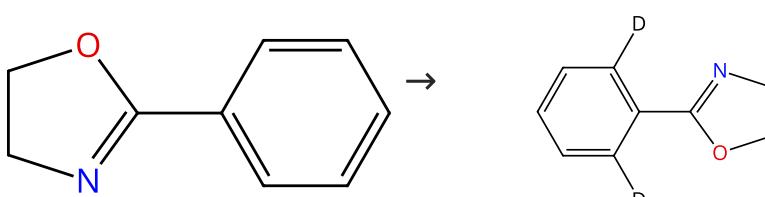
Bifurcated Rhodaelectro-Catalyzed C-H Activation for the Synthesis of Pyrroles and Lactones

By: Homoelle, Simon L.; et al

Precision Chemistry (2023), 1(6), 382-387.

Scheme 83 (4 Reactions)

Steps: 1 Yield: 86%

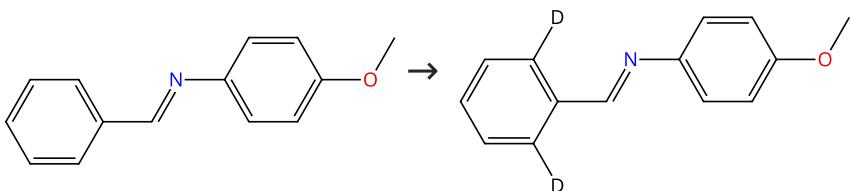


Suppliers (68)

31-614-CAS-38369177	Steps: 1 Yield: 86%	[3+2] Cascade Ring-Closing/Ring-Opening Strategy: Access to N-Indene-Tethered Amino Alcohols By: Mondal, Imtiaj; et al Organic Letters (2023), 25(46), 8199-8204.
1.1 Reagents: Sodium acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 2,2,2-Trifluoroethanol; 8 h, 80 °C	Experimental Protocols	
31-614-CAS-36256908	Steps: 1	Rhodium-Catalyzed [4 + 2] Cascade Annulation to Easy Access N-Substituted Indenoisoquinolinones By: Yue, Xuelin; et al Organic Letters (2023), 25(16), 2923-2927.
1.1 Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: Methanol- <i>d</i> ₄ ; 1 h, 70 °C		
31-116-CAS-23866985	Steps: 1	Rhodium(III)-Catalyzed Oxidative Cyclization of Oxazolines with Cyclopropanols: Synthesis of Isoindolinones By: Liu, Jidan; et al Organic Letters (2021), 23(15), 5927-5931.
1.1 Reagents: Cupric acetate, Methanol- <i>d</i> ₄ Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2); 2 h, 130 °C	Experimental Protocols	
31-116-CAS-20698432	Steps: 1	Sulfoxonium Ylides as Carbene Precursors: Rhodium(III)-Catalyzed Sequential C-H Functionalization, Selective Enol Oxygen-Atom Nucleophilic Addition, and Hydrolysis By: Huang, Yuanqiong; et al Advanced Synthesis & Catalysis (2019), 361(22), 5272-5276.
1.1 Reagents: Sodium acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro- <i>N</i> -[(trifluoromethyl)sulfonyl-κ <i>O</i>]methanesulfonamido-κ <i>O</i>]silver Solvents: Methanol- <i>d</i> ; 18 h, 90 °C		

Scheme 84 (1 Reaction)

Steps: 1 Yield: 86%



Suppliers (38)

31-116-CAS-18918681

Steps: 1 Yield: 86%

- 1.1 Reagents: Trifluoromethanesulfonyl azide, Zinc triflate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane, Methanol-*d*₄; 3 h, 110 °C

Experimental Protocols

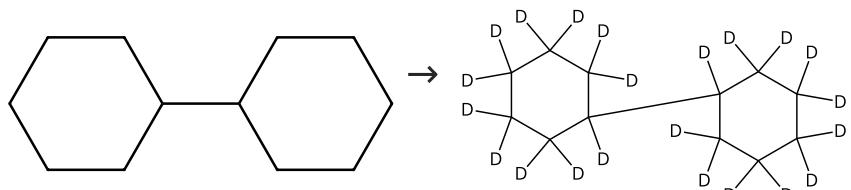
Rhodium(III)-Catalyzed Redox-Neutral Synthesis of Isoquinolinium Salts via C-H Activation of Imines

By: Tian, Miaomiao; et al

Journal of Organic Chemistry (2018), 83(12), 6477-6488.

Scheme 85 (1 Reaction)

Steps: 1 Yield: 86%



Suppliers (71)

31-116-CAS-827469

Steps: 1 Yield: 86%

1.1 Reagents: Water-*d*₂

Catalysts: Platinum, Rhodium

Solvents: 2-Propan-1,1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C

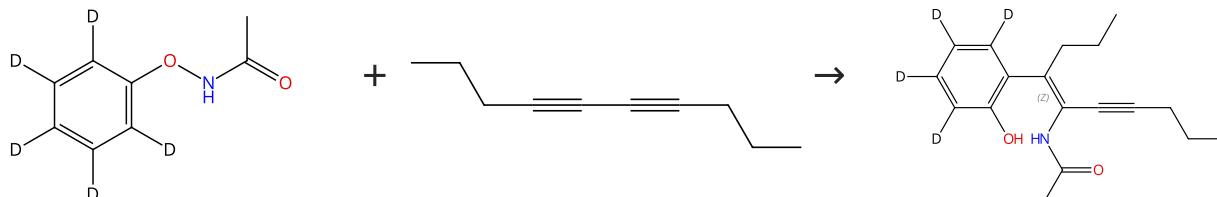
Experimental Protocols

Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 86 (1 Reaction)



Suppliers (44)

31-614-CAS-35120349

Steps: 1 Yield: 85%

1.1 Reagents: Zinc acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*₄; 5 min, 25 °C

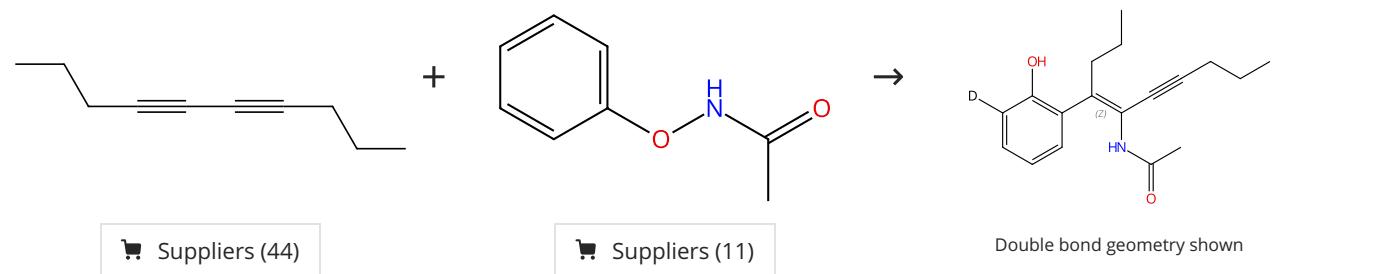
Experimental Protocols

Redox-neutral rhodium(III)-catalyzed divergent synthesis of tetrasubstituted 1,3-enynes and alkynylated benzofurans

By: Gong, Xin; et al

Organic & Biomolecular Chemistry (2023), 21(1), 147-152.

Scheme 87 (1 Reaction)



Suppliers (44)

Suppliers (11)

31-614-CAS-35120343

Steps: 1 Yield: 85%

1.1 Reagents: Zinc acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*₄; 5 min, 25 °C

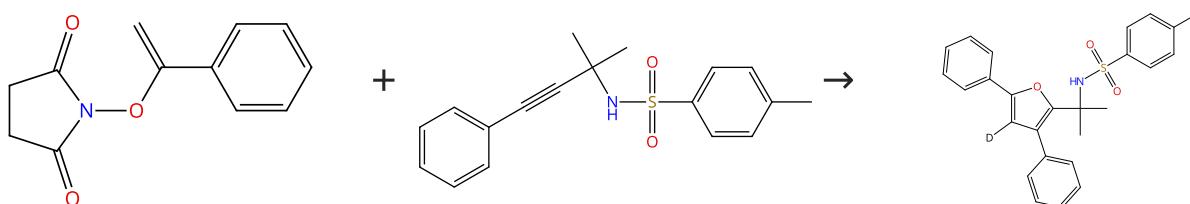
Experimental Protocols

Redox-neutral rhodium(III)-catalyzed divergent synthesis of tetrasubstituted 1,3-enynes and alkynylated benzofurans

By: Gong, Xin; et al

Organic & Biomolecular Chemistry (2023), 21(1), 147-152.

Scheme 88 (1 Reaction)



Steps: 1 Yield: 85%

31-614-CAS-39968536

Steps: 1 Yield: 85%

1.1 Reagents: Methanol-*d*₄, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 12 h, 40 °C

Experimental Protocols

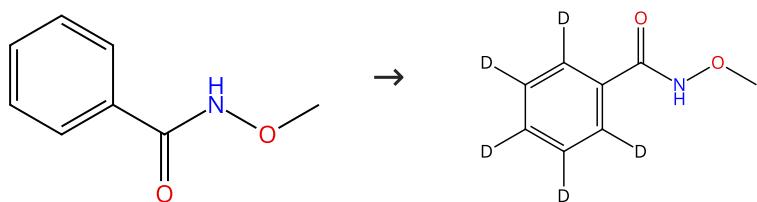
Synthesis of Polysubstituted Furan Frameworks via [3 + 2] Annulation of N-Oximeimides with Chelated Alkynes Initiated by Rh(III)-Catalyzed C-H Activation

By: Wu, Min; et al

Organic Letters (2023), 25(14), 2394-2399.

Scheme 89 (1 Reaction)

Steps: 1 Yield: 85%



Suppliers (49)

Supplier (1)

31-116-CAS-18305311

Steps: 1 Yield: 85%

1.1 Reagents: Cesium carbonate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-d₄; 20 h, 60 °C

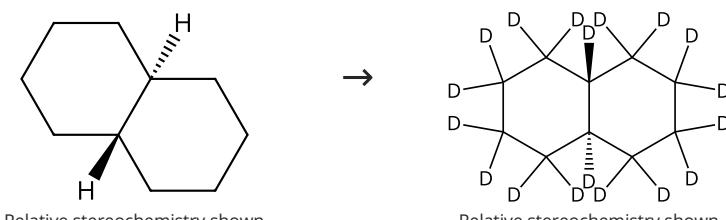
Microwave-Assisted Synthesis of Heterocycles by Rhodium(III)-Catalyzed Annulation of N-Methoxyamides with α-Chloroaldehydes

By: Huang, Ji-Rong; et al

Angewandte Chemie, International Edition (2017), 56(50), 15921-15925.

Scheme 90 (1 Reaction)

Steps: 1 Yield: 85%



Relative stereochemistry shown

Suppliers (48)

31-116-CAS-993514

Steps: 1 Yield: 85%

1.1 Reagents: Water-d₂
Catalysts: Platinum, Rhodium
Solvents: 2-Propan-1,1,1,2,3,3,3-d₇-ol-d; 24 h, 120 °C

Experimental Protocols

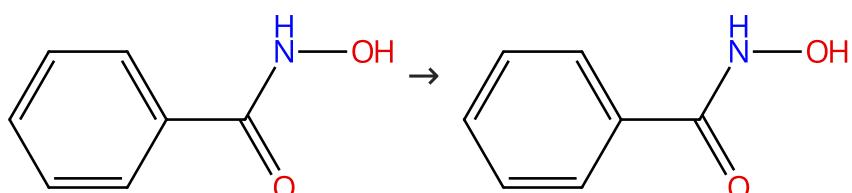
Multiple deuteriation of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 91 (2 Reactions)

Steps: 1 Yield: 85%



Suppliers (76)

31-614-CAS-33251921

Steps: 1 Yield: 85%

1.1 Reagents: Potassium bicarbonate, Methanol-d₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 12 h, 80 °C

Experimental Protocols

Rhodium(III)-Catalyzed Three-Component Cascade Annulation for Modular Assembly of N-Alkoxylated Isoindolin-1-Ones with Quaternary Carbon Center

By: Hu, Wenbo; et al

Advanced Synthesis & Catalysis (2022), 364(15), 2589-2595.

31-614-CAS-35472447

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Toluene; 12 h, 100 °C

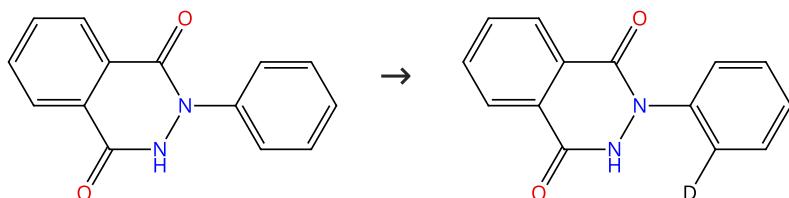
Rh-Catalyzed Cascade C-H Activation/Annulation of N-Hydroxybenzamides and Propargylic Acetates for Modular Access to Isoquinolones

By: Fang, Taibei; et al

Molecules (2022), 27(23), 8553.

Scheme 92 (1 Reaction)

Steps: 1 Yield: 85%



Suppliers (38)

31-116-CAS-22974023

Steps: 1 Yield: 85%

1.1 Reagents: Acetic acid-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 20 h, 80 °C

Direct Integration of Phthalazinone and Succinimide Scaffolds via Rh(III)-Catalyzed C-H Functionalization

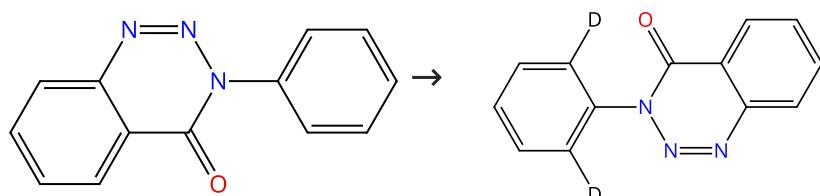
By: Cho, Yong Sun; et al

Asian Journal of Organic Chemistry (2021), 10(1), 202-209.

Experimental Protocols

Scheme 93 (1 Reaction)

Steps: 1 Yield: 84%



Suppliers (11)

31-614-CAS-41438189

Steps: 1 Yield: 84%

1.1 Reagents: Pivalic acid, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 9 h, 60 °C

Rh(III)-Catalyzed Selective C-H Alkylation and Alkenylation of 1,2,3-Benzotriazinones with Maleimides

By: Xiao, Lin; et al

Advanced Synthesis & Catalysis (2024), 366(17), 3646-3652.

Experimental Protocols

Scheme 94 (1 Reaction)

Steps: 1 Yield: 84%



31-614-CAS-37762470

Steps: 1 Yield: 84%

1.1 Reagents: Diphenylacetylene, Methanol-*d*₄, Oxygen
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: (Trifluoromethyl)benzene; 19 h, 80 °C

Rh(III)-catalyzed highly site- and regio-selective alkenyl C-H activation/annulation of 4-amino-2-quinolones with alkynes via reversible alkyne insertion

By: Hirako, Naohiro; et al

Chemical Science (2023), 14(39), 10971-10978.

Experimental Protocols

31-614-CAS-40741217

Steps: 1

- 1.1 **Reagents:** Sodium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 0.5 h, rt
- 1.2 **Reagents:** Sodium chloride
Solvents: Water; rt

Experimental Protocols

Synthesis of structurally diverse pyrazolo[1,2-a]pyrazolones based on the selective C-H bond alkenylation-annulation of 1-arylpolyazolidinones with allenyl acetates

By: Xin, Yongdi; et al

Organic Chemistry Frontiers (2024), 11(14), 3874-3880.

31-116-CAS-22330539

Steps: 1

- 1.1 **Reagents:** Sodium acetate, Zinc acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Toluene; 30 min, 100 °C

Experimental Protocols

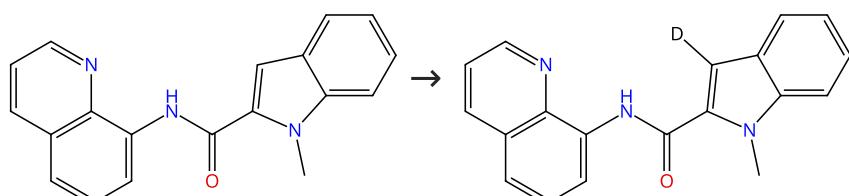
Synthesis of pyrazolone fused benzodia zepines via Rh(III)-catalyzed [4 + 3] annulation of 1- phenylpolyazolidinones with propargyl alcohols

By: Zhang, Linghua; et al

Organic Chemistry Frontiers (2020), 7(16), 2284-2290.

Scheme 98 (1 Reaction)

Steps: 1 Yield: 83%


🛒 Supplier (1)

31-614-CAS-31492412

Steps: 1 Yield: 83%

- 1.1 **Reagents:** Methanol-*d*₄, Acetic acid-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 30 h, 80 °C

Experimental Protocols

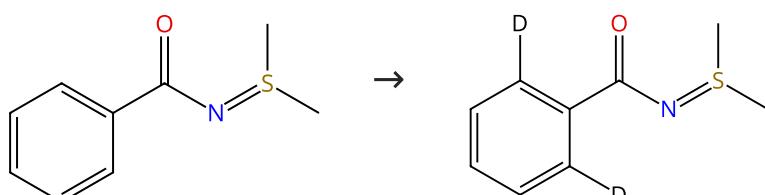
Co(II)-Catalyzed C-H/N-H Annulation of Cyclic Alkenes with Indole-2-carboxamides at Room Temperature: One-Step Access to β-Carboline-1-one Derivatives

By: Das Adhikari, Gopal Krushna; et al

Journal of Organic Chemistry (2022), 87(6), 4438-4448.

Scheme 99 (1 Reaction)

Steps: 1 Yield: 83%


🛒 Suppliers (4)

31-614-CAS-34097395

Steps: 1 Yield: 83%

- 1.1 **Reagents:** Methanol-*d*₄
Catalysts: Zinc acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 12 h, 80 °C

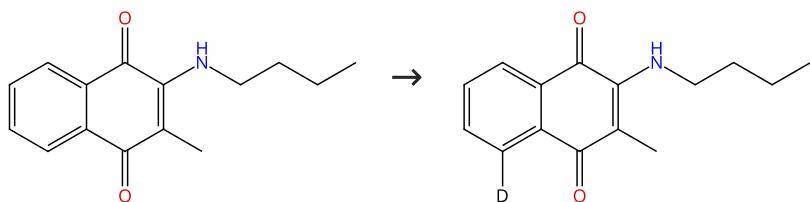
Sulfilimines as Transformable and Retainable Directing Groups in Rhodium-Catalyzed ortho-C-H Bond Functionalization

By: Liu, Jiechun; et al

Organic Letters (2022), 24(37), 6772-6776.

Scheme 100 (1 Reaction)

Steps: 1 Yield: 82%



Suppliers (5)

31-614-CAS-42726738

Steps: 1 Yield: 82%

1.1 Reagents: Silver carbonate, Methanol-*d*
Catalysts: Silver tetrafluoroborate, Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium
Solvents: 1,2-Dichloroethane; 2 - 5 h, 100 °C

Experimental Protocols

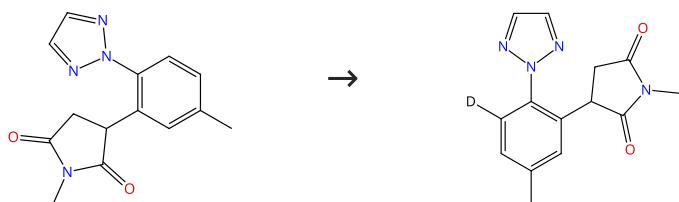
Rhodium(III)-Catalyzed Regioselective C-H Alkenylation and Alkylation of Menadione Analogues with β -Trifluoromethyl Enones

By: Sindhe, Haritha; et al

Organic Letters (2024), 26(46), 10002-10007.

Scheme 101 (1 Reaction)

Steps: 1 Yield: 82%



31-116-CAS-19610337

Steps: 1 Yield: 82%

1.1 Reagents: Methanol-*d*₄, Silver hexafluoroantimonate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 12 h, 80 °C

Rhodium(III)-Catalyzed Direct C-H Alkylation of 2-Aryl-1,2,3-triazole N-Oxides with Maleimides

By: Zhao, Juanli; et al

European Journal of Organic Chemistry (2018), 2018(48), 6919-6923.

Scheme 102 (1 Reaction)

Steps: 1 Yield: 82%



Suppliers (93)

31-116-CAS-20659774

Steps: 1 Yield: 82%

1.1 Reagents: Sodium acetate, Oxygen, Water-*d*₂
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*O*-C-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: Methanol-*d*₄; 24 h, 90 °C

1.2 Reagents: Hydrochloric acid
Solvents: Dichloromethane, Water; 15 min

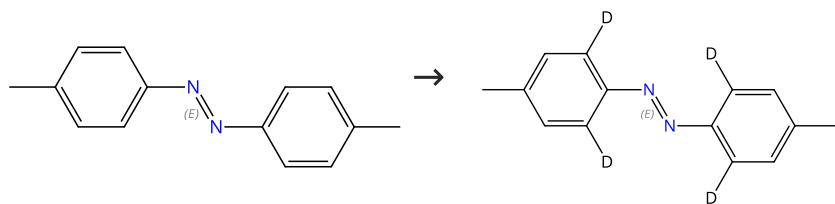
A Protocol for the Ortho-Deuteration of Acidic Aromatic Compounds in D₂O Catalyzed by Cationic Rh^{III}

By: Garreau, Alyssa L.; et al

Organic Letters (2019), 21(17), 7044-7048.

Scheme 103 (1 Reaction)

Steps: 1 Yield: 81%



Double bond geometry shown

Double bond geometry shown

🛒 Suppliers (21)
31-116-CAS-18673840

Steps: 1 Yield: 81%

1.1 Reagents: Cupric acetate, Methanol-*d*, Oxygen, Basic copper carbonate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; rt; 24 h, 110 °C

Experimental Protocols

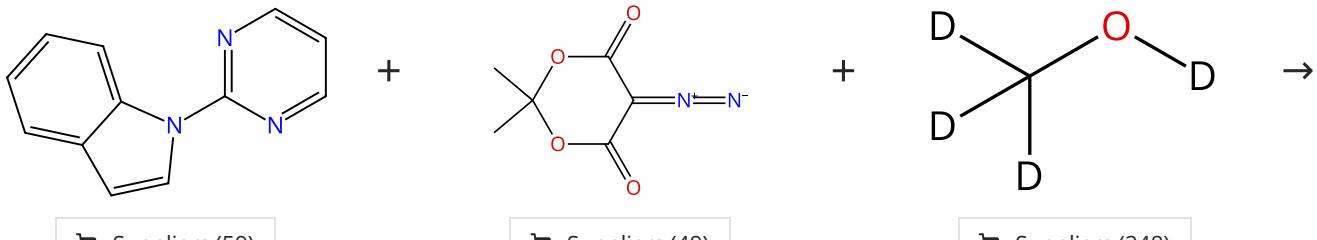
Synthesis of (2H)-Indazoles through Rh(III)-Catalyzed Annulation Reaction of Azobenzenes with Sulfoxonium Ylides

By: Oh, Hyunjung; et al

Journal of Organic Chemistry (2018), 83(7), 4070-4077.

Scheme 104 (1 Reaction)

Steps: 1 Yield: 81%


🛒 Suppliers (59)
🛒 Suppliers (49)
🛒 Suppliers (248)
31-614-CAS-28785934

Steps: 1 Yield: 81%

1.1 Reagents: Oxygen

Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*C₆-11)-hexafluoro antimonate(1-) (1:2); 15 h, 80 °C

Experimental Protocols

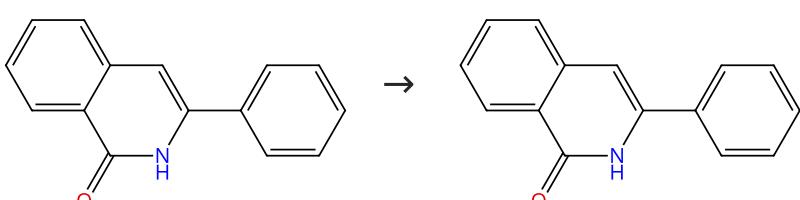
Rhodium(III)-catalyzed C2-selective carbenoid functionalization and subsequent C7-alkenylation of indoles

By: Shi, Jingjing; et al

Chemical Communications (Cambridge, United Kingdom) (2014), 50(49), 6483-6486.

Scheme 105 (1 Reaction)

Steps: 1 Yield: 81%


🛒 Suppliers (18)

31-614-CAS-29985146

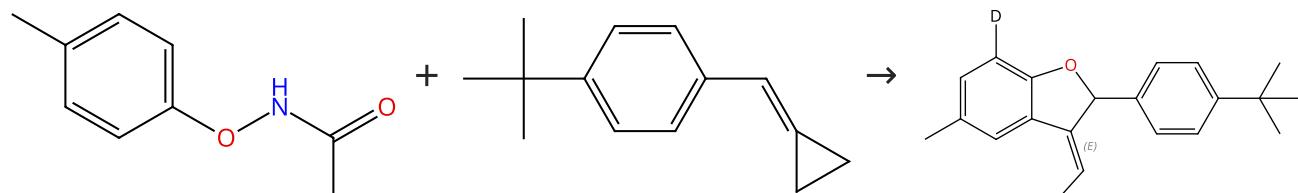
Steps: 1 Yield: 81%

Rh(III)-Catalyzed Oxidative Spirocyclization of Isoquinolones with α -Diazoo-1,3-indandiones

By: Guo, Shanghai; et al

Organic Letters (2019), 21(11), 4082-4086.

Scheme 106 (1 Reaction)



Suppliers (2)

Suppliers (3)

Steps: 1 Yield: 80%

Double bond geometry shown

31-116-CAS-23468824

Steps: 1 Yield: 80%

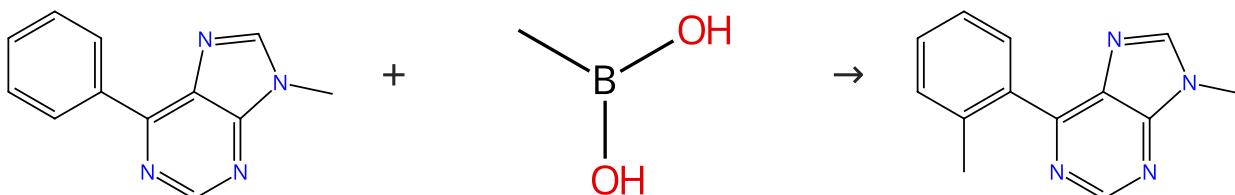
Rh(III)-Catalyzed Chemodivergent Coupling of N-Phenoxyacetamides and Alkylenecyclopropanes via C-H Activation

By: Xu, Guiqing; et al

Organic Letters (2021), 23(8), 2927-2932.

Experimental Protocols

Scheme 107 (1 Reaction)



Suppliers (7)

Suppliers (96)

Steps: 1 Yield: 80%

31-614-CAS-31803191

Steps: 1 Yield: 80%

Facilitating Rh-Catalyzed C-H Alkylation of (Hetero)arenes and 6-Arylpurine Nucleosides (Nucleotides) with Electrochemistry

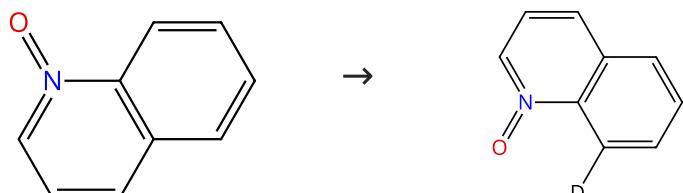
By: Yang, Qi-Liang; et al

Journal of Organic Chemistry (2022), 87(9), 6161-6178.

Experimental Protocols

Scheme 108 (3 Reactions)

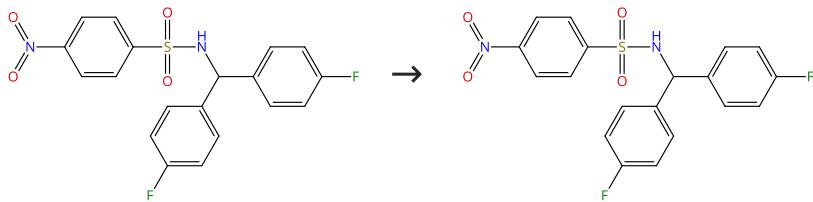
Steps: 1 Yield: 68-80%

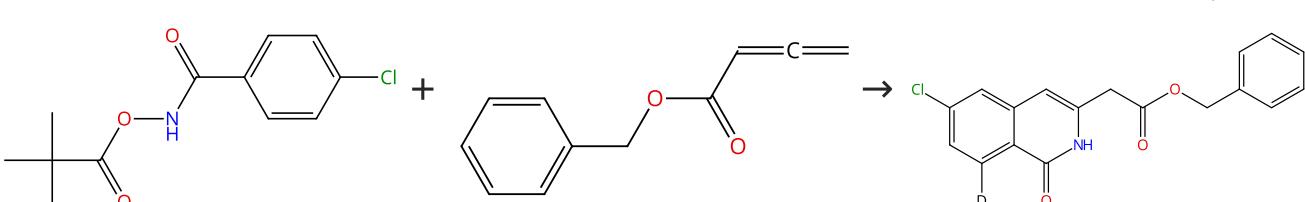


Suppliers (57)

Supplier (1)

31-116-CAS-20662384	Steps: 1 Yield: 80%	Rh(III)-Catalyzed C(8)-H Activation of Quinoline N-Oxides: Regioselective C-Br and C-N Bond Formation By: Dhiman, Ankit Kumar; et al Journal of Organic Chemistry (2019), 84(20), 12871-12880.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Sodium acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 2,2,2-Trifluoroethan-1,1- <i>d</i> ₂ -ol- <i>d</i> ; 1 h, 50 °C	Experimental Protocols	
31-116-CAS-19783160	Steps: 1 Yield: 68%	Rh/O₂-Catalyzed C8 Olefination of Quinoline N-Oxides with Activated and Unactivated Olefins By: Sharma, Ritika; et al Journal of Organic Chemistry (2019), 84(5), 2786-2797.
1.1 Reagents: Acetic acid, Methanol- <i>d</i> ₄ , Oxygen Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: Acetone; 5 h, 70 °C; cooled	Experimental Protocols	
31-116-CAS-27015048	Steps: 1	Rh(III)-Catalyzed Regioselective C8-Alkylation of Quinoline N-Oxides with Maleimides and Acrylates By: Thakur, Ankita; et al Journal of Organic Chemistry (2021), 86(9), 6612-6621.
1.1 Reagents: Methanol- <i>d</i> ₄ , Acetic acid- <i>d</i> ₄ Catalysts: Silver acetate, Silver hexafluoroantimonate, Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium Solvents: 1,2-Dichloroethane; 6 h, 80 °C	Experimental Protocols	

Scheme 109 (1 Reaction)	Steps: 1 Yield: 80%
	
31-614-CAS-31944086	Steps: 1 Yield: 80%
1.1 Reagents: Methanol- <i>d</i> ₄ , Silver oxide (Ag ₂ O) Catalysts: 1-Adamantanecarboxylic acid, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Dichloromethane; 24 h, 50 °C	Mild Three-Step Consecutive C-H Activations By: Liu, Yao-Yao; et al Organic Letters (2022), 24(17), 3118-3122.
Experimental Protocols	

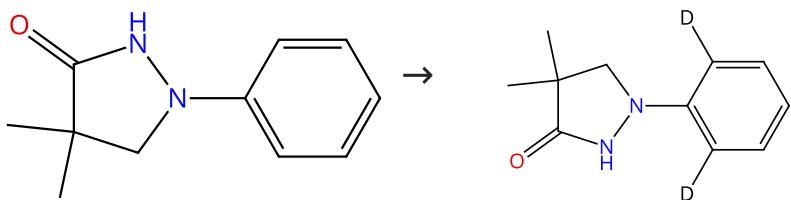
Scheme 110 (1 Reaction)	Steps: 1 Yield: 78%
	

 Suppliers (10) Suppliers (11)

31-614-CAS-38862642	Steps: 1 Yield: 78%	Cp*Rh(iii)-catalyzed regioselective cyclization of aromatic amides with allenes By: Liu, Jing; et al Chemical Communications (Cambridge, United Kingdom) (2024), 60(5), 598-601.
1.1 Reagents: Methanol- <i>d</i> , Barium chloride Catalysts: Silver acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,4-Dioxane; 6 h, 60 °C		
1.2 Reagents: Ammonium chloride Solvents: Water	Experimental Protocols	

Scheme 111 (3 Reactions)

Steps: 1 Yield: 77%


 Suppliers (25)

31-116-CAS-18371097

Steps: 1 Yield: 77%

1.1 Reagents: Methanol-*d*₄, Sodium cyanate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol; 4 h, 45 °C

Construction of Pyridazine Analogues via Rhodium-mediated C-H Activation

By: Yang, Chao; et al

Advanced Synthesis & Catalysis (2017), 359(20), 3496-3502.

31-614-CAS-35421855

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄
Catalysts: Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium
Solvents: 1,2-Dichloroethane; 30 min, 80 °C

Solvent-Dependent Selective Synthesis of CF₃-Tethered Indazole Derivatives Based on Multiple Bond Activations

By: Li, Hao; et al

Organic Letters (2023), 25(5), 720-725.

Experimental Protocols

31-614-CAS-33458132

Steps: 1

1.1 Reagents: Zinc acetate, Methanol-*d*₄
Catalysts: Di-μ-chlorodichlorobis(η⁵-2,4-cyclopentadien-1-yl)dirhodium
Solvents: Toluene; 30 min, 100 °C

Synthesis of pyrazolidinone fused cinnolines via the cascade reactions of 1-phenylpyrazolidinones with vinylene carbonate

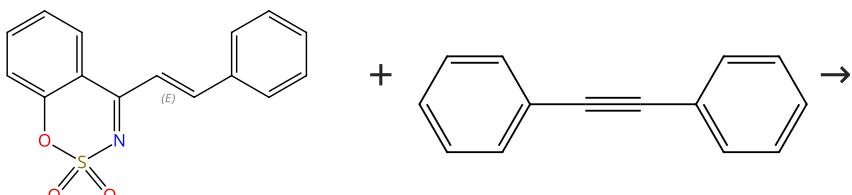
By: Li, Na; et al

Tetrahedron Letters (2022), 103, 153984.

Experimental Protocols

Scheme 112 (1 Reaction)

Steps: 1 Yield: 77%



Double bond geometry shown

 Suppliers (88)

 Suppliers (2)

31-116-CAS-6259289

Steps: 1 Yield: 77%

1.1 Reagents: Methanol-*d*₄, Silver tetrafluoroborate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 36 h, 60 °C; 60 °C → rt

1.2 Reagents: Potassium carbonate
Solvents: Water; neutralized, rt

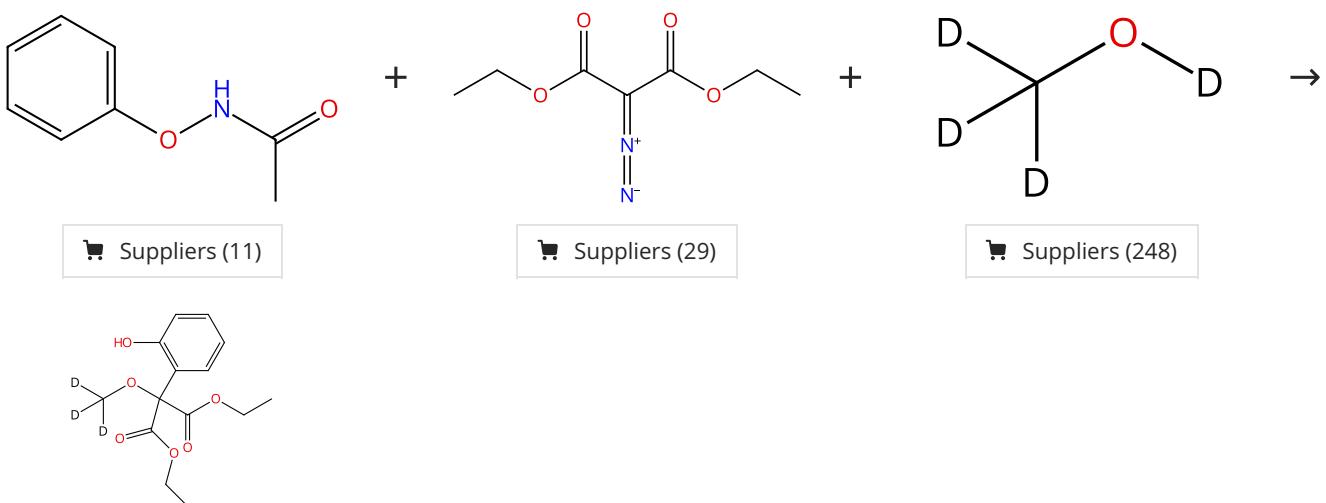
Highly functionalized pyridines synthesis from N-sulfonyl ketimines and alkynes using the N-S bond as an internal oxidant

By: Zhang, Qian-Ru; et al

Organic Letters (2014), 16(6), 1684-1687.

Experimental Protocols

Scheme 113 (1 Reaction)



31-011-CAS-10523949

Steps: 1 Yield: 76%

1.1 Reagents: Oxygen

Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoroantimonate(1-) (1:2)

Solvents: Methanol-*d*₄; 10 h, rt

Rh(III)-catalyzed and alcohol-involved carbenoid C-H insertion into N-phenoxycetamides using α -diazomalonates

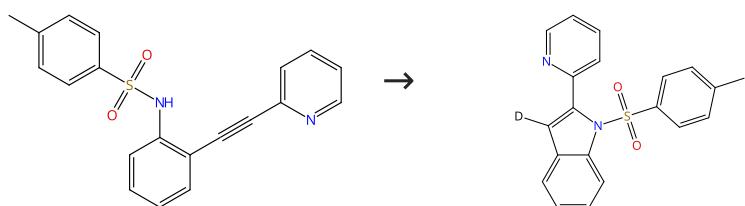
By: Zhou, Jie; et al

Chemical Communications (Cambridge, United Kingdom) (2015), 51(27), 5868-5871.

Experimental Protocols

Scheme 114 (1 Reaction)

Steps: 1 Yield: 76%



31-614-CAS-39316882

Steps: 1 Yield: 76%

1.1 Reagents: Pivalic acid, Methanol-*d*₄, Silver fluoride (AgF₂)

Catalysts: Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13b*R*)-3,7-dihydro-2,8-dimethoxy-3a-*H*-cyclopenta[6,7]cycloocta[2,1-*a*:3,4-*a'*]dinaphthalen-3a-yl]dirhodium

Solvents: 1,2-Dichloroethane; 3 h, rt

Enantioselective Synthesis of Indole-Derived Axially Chiral Frameworks via Cp^XRh(III)-Catalyzed Domino Cyclization/C₃-Arylation of 2-Alkynylanilines with 1-Diazonaphthoquinones

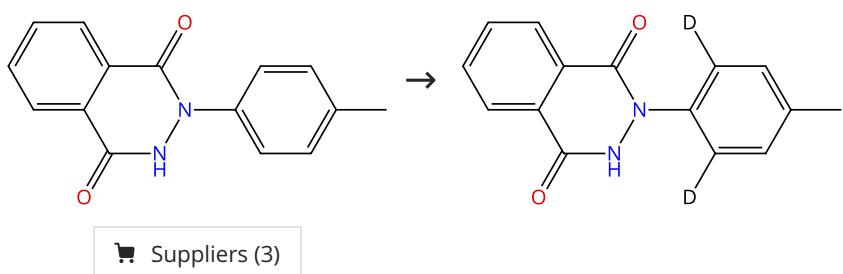
By: Ye, Junwei; et al

Advanced Synthesis & Catalysis (2024), 366(5), 1064-1069.

Experimental Protocols

Scheme 115 (3 Reactions)

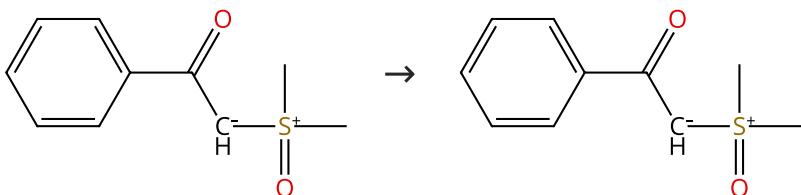
Steps: 1 Yield: 69-75%



31-614-CAS-24060273	Steps: 1 Yield: 75%	Rhodium-Catalyzed Spirocyclization of Maleimide with N-Aryl-2,3-dihydrophthalazine-1,4-dione to Access Pentacyclic Spiro-Succinimides By: Karishma, Pidiyara; et al Asian Journal of Organic Chemistry (2021), 10(10), 2580-2590.
1.1 Reagents: Silver acetate, Acetic acid- <i>d</i> ₄ , Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,2-Dichloroethane; 12 h, 120 °C Experimental Protocols		
31-614-CAS-23948698	Steps: 1 Yield: 69%	A direct synthesis method towards spirocyclic indazole derivatives via Rh(III)-catalyzed C-H activation and spiroannulation By: Zhou, Jian; et al Organic Chemistry Frontiers (2021), 8(18), 5024-5031.
1.1 Reagents: Silver acetate, Methanol- <i>d</i> ₄ Catalysts: Dirhodium tetraacetate Solvents: Acetonitrile; 12 h, 100 °C Experimental Protocols		
31-614-CAS-23976260	Steps: 1	Direct synthesis of indazole derivatives via Rh(III)-catalyzed C-H activation of phthalazinones and allenes By: Yin, Chuanliu; et al Organic & Biomolecular Chemistry (2021), 19(35), 7701-7705.
1.1 Reagents: Sodium acetate, Silver acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Acetonitrile; 12 h, 120 °C Experimental Protocols		

Scheme 116 (6 Reactions)

Steps: 1 Yield: 75%



Suppliers (38)

31-614-CAS-31268433	Steps: 1 Yield: 75%	Sulfoxonium-Ylide-Directed C-H Activation and Tandem (4 + 1) Annulation By: Hanchate, Vinayak; et al Organic Letters (2020), 22(8), 2878-2882.
1.1 Reagents: Acetic acid, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver tetrafluoroborate Solvents: 2,2,2-Trifluoroethanol; 1 h, 60 °C		

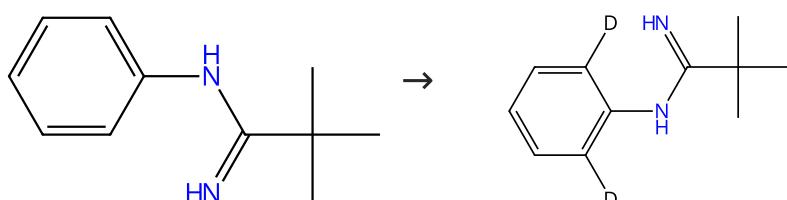
31-614-CAS-36485409	Steps: 1	Cascade C-H Activation/Annulation of Sulfoxonium Ylides with Vinyl Cyclopropanes: Access to Cyclopropane-Fused α-Tetralones By: Saha, Sharajit; et al Organic Letters (2023), 25(19), 3352-3357.
1.1 Reagents: Zinc acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,2-Dichloroethane; 20 min, 80 °C Experimental Protocols		

31-614-CAS-36073872	Steps: 1	Rh(III)-Catalyzed C-H Annulation of Sulfoxonium Ylides and 1,3-Dynes: A Rapid Access to Alkynyl-1-Naphthol Derivatives By: Kumar, Sanjeev; et al Chemistry - An Asian Journal (2023), 18(8), e202201201.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Dichloromethane; 10 min, 50 °C Experimental Protocols		

31-614-CAS-32014043	Steps: 1	Synthesis of Indenone Derivatives by Rh(III)-Catalyzed C-H Functionalization of Sulfoxonium Ylides with 1,3-Dynes By: Kumar, Sanjeev; et al Organic Letters (2022), 24(18), 3395-3400.
1.1 Reagents: Acetic acid- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 2-Propan-2- <i>d</i> -ol- <i>d</i> , 1,1,1,3,3-hexafluoro-; 10 min, 70 °C Experimental Protocols	Steps: 1	
31-614-CAS-29260548	Steps: 1	Rh(III)-Catalyzed Cascade Reactions of Sulfoxonium Ylides with α-Diazocarbonyl Compounds: An Access to Highly Functionalized Naphthalenones By: Chen, Xi; et al Organic Letters (2019), 21(8), 2541-2545.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 2,2,2-Trifluoroethanol; 30 min, 100 °C; 100 °C → rt 1.2 Reagents: Sodium chloride Solvents: Water Experimental Protocols	Steps: 1	
31-614-CAS-27510176	Steps: 1	Rhodium(III)-Catalyzed Synthesis of Naphthols via C-H Activation of Sulfoxonium Ylides By: Xu, Youwei; et al Organic Letters (2017), 19(16), 4307-4310.
1.1 Reagents: Zinc acetate Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2) Solvents: 1,2-Dichloroethane, Methanol- <i>d</i> ₄ ; 1 h, 80 °C Experimental Protocols	Steps: 1	

Scheme 117 (2 Reactions)

Steps: 1 Yield: 75%

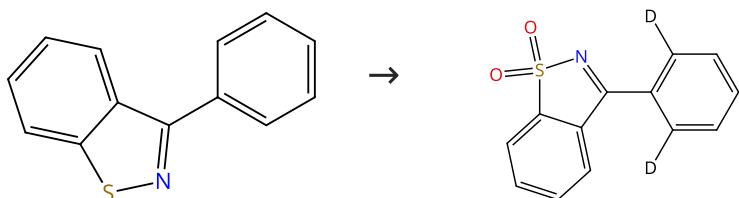


Suppliers (6)

31-614-CAS-39587855	Steps: 1 Yield: 75%	Synthesis of functionalized quinolines from the cascade reactions of N-aryl amidines with two CF ₃ -ynones via C-H/N-H/C-N/C-C bond cleavage By: Li, Hao; et al Organic Chemistry Frontiers (2024), 11(7), 1917-1923.
1.1 Reagents: Pivalic acid, Cupric acetate, Methanol- <i>d</i> ₄ Catalysts: Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium; 1 h, 70 °C Experimental Protocols	Steps: 1	
31-614-CAS-24225257	Steps: 1	Synthesis of N-acylbenzimidazoles through [4 + 1] annulation of N-arylpivalimidamides with dioxazolones By: Song, Xia; et al Organic Chemistry Frontiers (2021), 8(22), 6265-6272.
1.1 Reagents: Zinc acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluorophosphate Solvents: Ethyl acetate; 30 min, 110 °C; 110 °C → rt 1.2 Reagents: Water Experimental Protocols	Steps: 1	

Scheme 118 (1 Reaction)

Steps: 1 Yield: 75%



Suppliers (10)

31-614-CAS-39967010

Steps: 1 Yield: 75%

1.1 Reagents: Sodium acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
 Solvents: 2,2,2-Trifluoroethanol; 16 h, 80 °C

Experimental Protocols

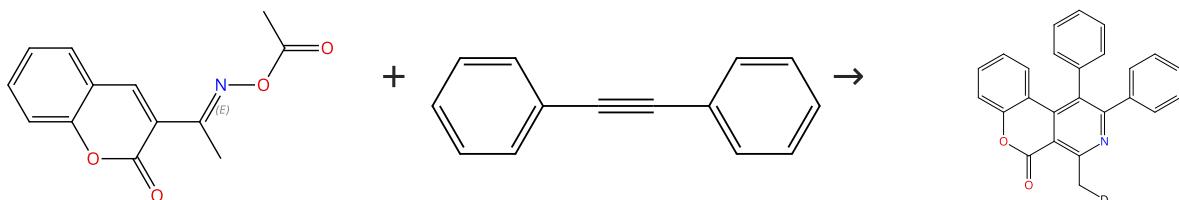
Rh(III)-catalyzed sequential spiroannulation/lactonization of 3-aryl N-sulfonyl ketimines with 4-hydroxy-2-alkynoates by C-H bond activation

By: Prashanth, S.; et al

New Journal of Chemistry (2024), 48(17), 7646-7650.

Scheme 119 (1 Reaction)

Steps: 1 Yield: 74%



Double bond geometry shown

Suppliers (88)

31-116-CAS-20308839

Steps: 1 Yield: 74%

1.1 Reagents: Methanol-*d*₄
 Catalysts: Sodium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 8 h, 50 °C

Experimental Protocols

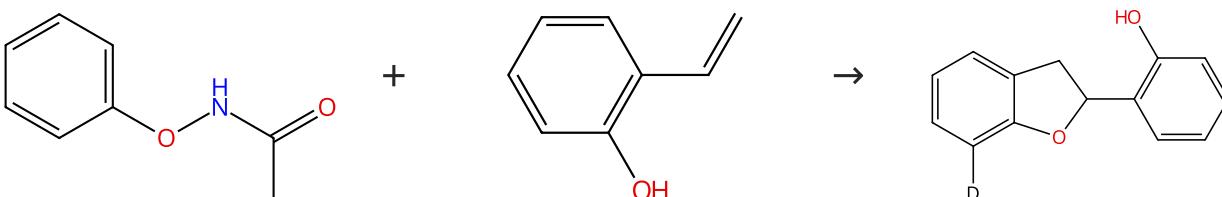
Synthesis of Chromeno[3,4-c]pyridines by Rhodium(III)-Catalyzed Annulation of Coumarinyl Ketoxime Esters and Alkynes

By: Li, Jiang-Sheng; et al

Tetrahedron (2019), 75(33), 4602-4610.

Scheme 120 (1 Reaction)

Steps: 1 Yield: 74%



Suppliers (11)

Suppliers (38)

31-614-CAS-31689908

Steps: 1 Yield: 74%

1.1 Reagents: Zinc acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 4 h, rt

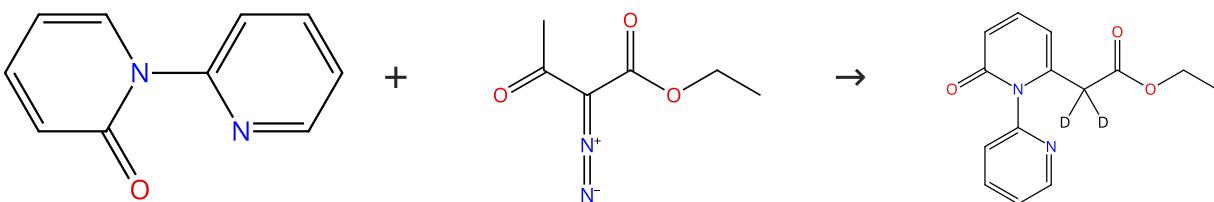
Experimental Protocols

Specific assembly of dihydrobenzofuran frameworks via Rh(II)-catalyzed C-H coupling of N-phenoxyacetamides with 2-alkenylphenols

By: Wei, Yinhui; et al

New Journal of Chemistry (2022), 46(12), 5705-5711.

Scheme 121 (1 Reaction)



Suppliers (8)

Suppliers (41)

31-136-CAS-23473527

Steps: 1 Yield: 73%

1.1 Reagents: Sodium acetate, Methanol-*d*4Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluorophosphate; 6 h, 80 °C

Experimental Protocols

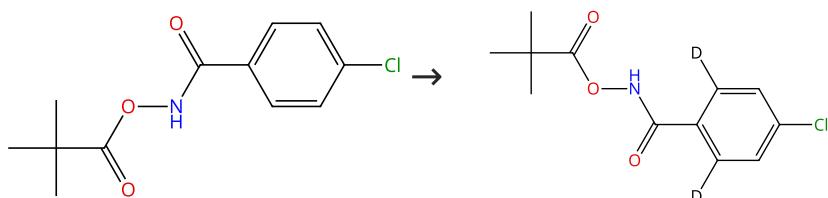
Rh(III)-catalyzed C6-selective Acylmethylation and Carboxymethylation of 2-Pyridones with Diazo Compounds

By: Wang, Xinyu; et al

ChemCatChem (2021), 13(7), 1730-1737.

Scheme 122 (1 Reaction)

Steps: 1 Yield: 72%



Suppliers (10)

31-614-CAS-38862646

Steps: 1 Yield: 72%

1.1 Reagents: Methanol-*d*, Barium chlorideCatalysts: Silver acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,4-Dioxane; 6 h, 60 °C

1.2 Reagents: Ammonium chloride

Solvents: Water

Experimental Protocols

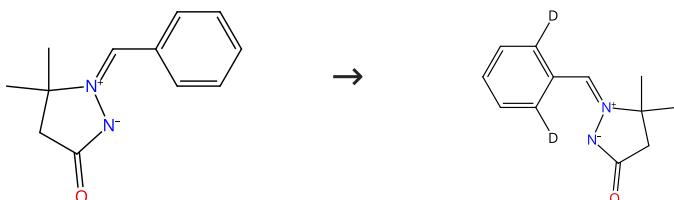
Cp*Rh(iii)-catalyzed regioselective cyclization of aromatic amides with allenes

By: Liu, Jing; et al

Chemical Communications (Cambridge, United Kingdom) (2024), 60(5), 598-601.

Scheme 123 (6 Reactions)

Steps: 1 Yield: 58-72%



Suppliers (2)

31-116-CAS-23889574

Steps: 1 Yield: 72%

1.1 Reagents: Methanol-*d*₄, Copper sulfateCatalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; 1 h, 100 °C

Experimental Protocols

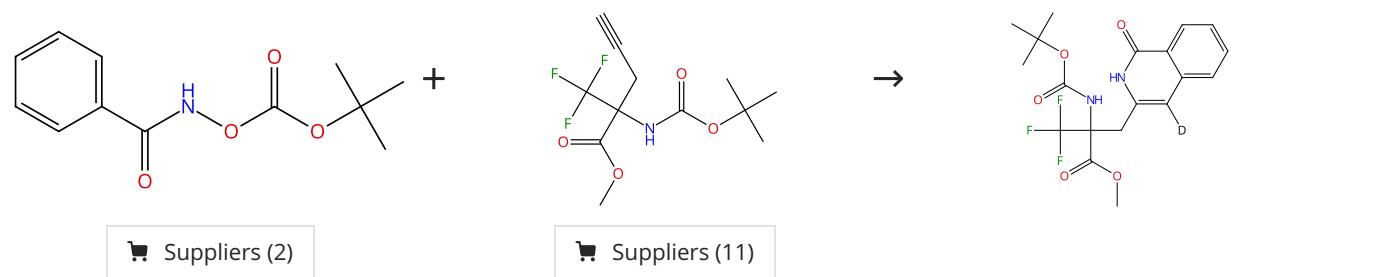
Rh(III)-Catalyzed Dual C-H Functionalization/Cyclization Cascade by a Removable Directing Group: A Method for Synthesis of Polycyclic Fused Pyrano[de]Isochromenes

By: Shu, Zhihao; et al

Journal of Organic Chemistry (2020), 85(19), 12097-12107.

31-614-CAS-31443591	Steps: 1 Yield: 58%	<p>Enantioselective synthesis of indenopyrazolopyrazolones enabled by dual directing groups-assisted and rhodium(III)-catalyzed tandem C-H alkenylation/[3 + 2] stepwise cycloaddition</p> <p>By: Wu, Min; et al Chinese Chemical Letters (2022), 33(2), 842-846.</p>
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Silver fluoride (AgF ₂), Di- μ -iododiodobis[(11a,12,13,14,14a- η)-(6 <i>S</i>)-4,5,6,7,11-pentahydro-1,10-dimethoxycyclopent[5,6]inden[7',1':8,9,1]cyclonon[1,2,3- <i>c,d</i>]inden-11a-yl] dirhodium Solvents: 2,2,2-Trifluoroethanol; 12 h, rt	Experimental Protocols	
31-614-CAS-38859931	Steps: 1	<p>Construction of Polyheterocyclic Skeletons through C-H Bond Activation-Initiated Cascade Reactions by Using Cyclopropanol as Alkylating Agent as well as Masked Nucleophile and Electrophile</p> <p>By: Yang, Xueying; et al Advanced Synthesis & Catalysis (2024), 366(1), 141-147.</p>
1.1 Reagents: Cupric acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: Ethanol; 1 h, 80 °C	Experimental Protocols	
31-614-CAS-36213853	Steps: 1	<p>Transition Metal-Controlled Divergent Annulations of Azomethine Imines with Iodonium Ylides via C-Centered [1,2]-Rearrangement</p> <p>By: Ren, Jie; et al Organic Letters (2023), 25(15), 2582-2587.</p>
1.1 Reagents: 1-Adamantanecarboxylic acid, [1,1,1-Trifluoro- <i>N</i> [(trifluoromethyl)sulfonyl- κ O]methanesulfonamido- κ O]silver Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,2-Dichloroethane, Methanol- <i>d</i> ₄ ; 12 h, 80 °C	Experimental Protocols	
31-614-CAS-35960185	Steps: 1	<p>A divergent construction of fused and bridged carbo-/heterocyclic scaffolds via cascade reactions of aryl azomethine imines with vinyl cyclic carbonates</p> <p>By: Cai, Xinyuan; et al Organic Chemistry Frontiers (2023), 10(4), 1015-1021.</p>
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Silver hexafluoroantimonate, Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:2) Solvents: 2,2,2-Trifluoroethanol; 1 h, 120 °C	Experimental Protocols	
31-614-CAS-33647733	Steps: 1	<p>Concise Synthesis of Spirocyclic Dihydrophthalazines through Spiroannulation Reactions of Aryl Azomethine Imines with Cyclic Diazo Compounds</p> <p>By: Cai, Xinyuan; et al Journal of Organic Chemistry (2022), 87(16), 11048-11062.</p>
1.1 Reagents: Silver acetate, Methanol- <i>d</i> ₄ Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:2) Solvents: Acetonitrile; 30 min, 100 °C	Experimental Protocols	

Scheme 124 (1 Reaction)



31-614-CAS-25807428

Steps: 1 Yield: 71%

1.1 Reagents: Cesium acetate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; rt

Experimental Protocols

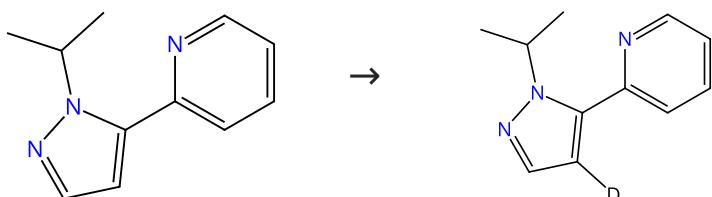
Rh(III)-Catalyzed C-H activation/annulation of aryl hydrox amates with CF₃-containing α -propargyl α -amino acid derivatives

By: Vorobyeva, Daria V.; et al

European Journal of Organic Chemistry (2021), 2021(12), 1883-1890.

Scheme 125 (1 Reaction)

Steps: 1 Yield: 71%



31-614-CAS-37486611

Steps: 1 Yield: 71%

1.1 Reagents: Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Tetrahydrofuran; 4 h, 80 °C

Experimental Protocols

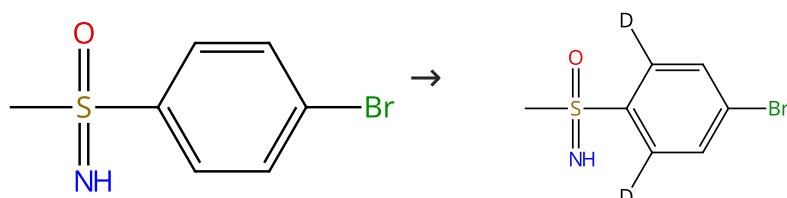
Rh-Catalyzed C-H Functionalization of the (Pyrazol-5-yl) pyridine Core of GBT-440

By: Kalshetti, Rupali G.; et al

Synthesis (2023), 55(21), 3600-3609.

Scheme 126 (1 Reaction)

Steps: 1 Yield: 70%



Suppliers (50)

31-614-CAS-40127593

Steps: 1 Yield: 70%

1.1 Reagents: Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluorophosphate
Solvents: Methanol; 1 h, 90 °C

Experimental Protocols

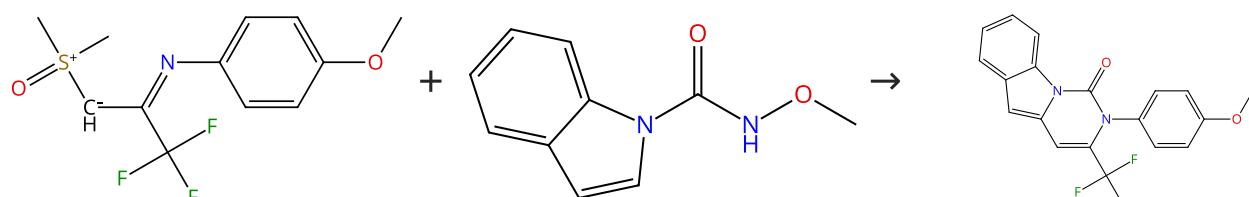
A rhodium-catalyzed cascade C-H activation/annulation strategy for the expedited assembly of pyrrolidinedione-fused 1,2-benzothiazines

By: Wu, Yinsong; et al

Organic & Biomolecular Chemistry (2024), 22(17), 3523-3532.

Scheme 127 (1 Reaction)

Steps: 1 Yield: 70%



Supplier (1)

31-614-CAS-37084966

Steps: 1 Yield: 70%

1.1 Reagents: Pivalic acid, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 1 h, 100 °C

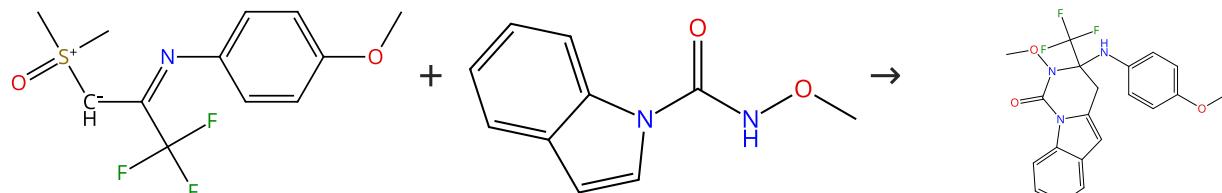
Experimental Protocols

Rh(III)-catalyzed C-H activation/annulation of N-carbamoyl indoles with CF₃-imidoyl sulfoxonium ylides for the divergent synthesis of trifluoromethyl-substituted (dihydro)pyrimidindolones

By: Duan, Yubo; et al

Organic Chemistry Frontiers (2023), 10(15), 3843-3848.

Scheme 128 (1 Reaction)



Steps: 1 Yield: 70%

Supplier (1)

31-614-CAS-37084967

Steps: 1 Yield: 70%

1.1 Reagents: Pivalic acid, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Acetonitrile; 1 h, 100 °C

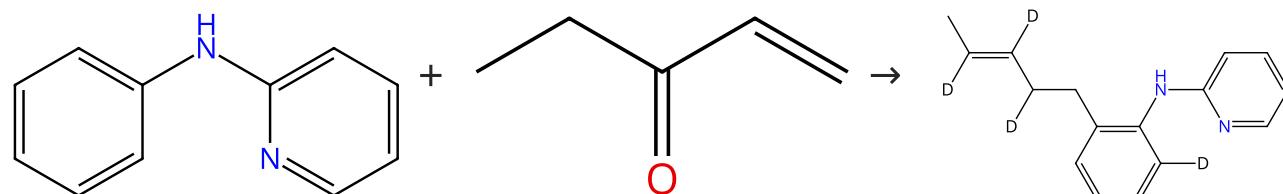
Experimental Protocols

Rh(III)-catalyzed C-H activation/annulation of N-carbamoyl indoles with CF₃-imidoyl sulfoxonium ylides for the divergent synthesis of trifluoromethyl-substituted (dihydro)pyrimidindolones

By: Duan, Yubo; et al

Organic Chemistry Frontiers (2023), 10(15), 3843-3848.

Scheme 129 (1 Reaction)



Steps: 1 Yield: 70%

Suppliers (73)

Suppliers (35)

31-085-CAS-18874916

Steps: 1 Yield: 70%

1.1 Catalysts: Zinc acetate, Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: 2-Propan-1,1,1,2,3,3,3-*d*₇-ol-*d*; 12 h, 80 °C

Experimental Protocols

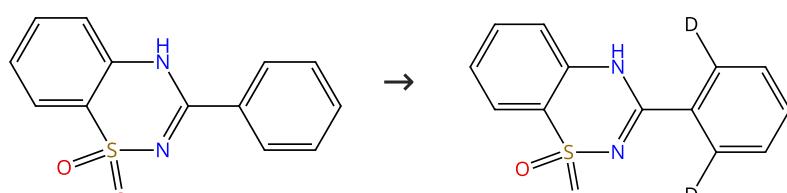
Divergent Coupling of Anilines and Enones by Integration of C-H Activation and Transfer Hydrogenation

By: Zhou, Xukai; et al

Angewandte Chemie, International Edition (2018), 57(22), 6681-6685.

Scheme 130 (2 Reactions)

Steps: 1 Yield: 70%



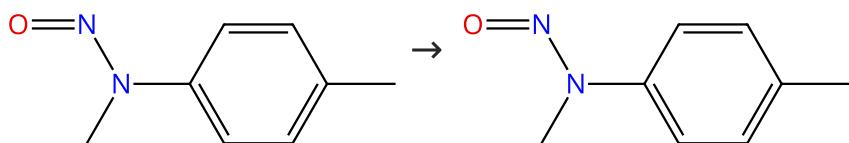
Suppliers (4)

31-614-CAS-42498602	Steps: 1 Yield: 70%	Rh(III)-Catalyzed Sequential ortho-C-H Bond Annulation and Desulfonylation of 3-Aryl-2H-benzo[e][1,2,4]thiadiazine-1,1-dioxides: Access to 1-Aminoisoquinolines By: Ajay, Chidrawar; et al Chemistry - An Asian Journal (2024), 19(23), e202400723.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: Tetrahydrofuran; rt; 16 h, 100 °C Experimental Protocols		

31-614-CAS-36849706	Steps: 1	Derivation of Benzothiadiazine-1,1-dioxide Scaffolds via Transition Metal-Catalyzed C-H Activation/Annulation By: Lai, Ruizhi; et al Chinese Journal of Chemistry (2023), 41(16), 1973-1978.
1.1 Reagents: Silver carbonate, Silver acetate, Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Acetonitrile; 4 h, 100 °C Experimental Protocols		

Scheme 131 (1 Reaction)

Steps: 1 Yield: 70%

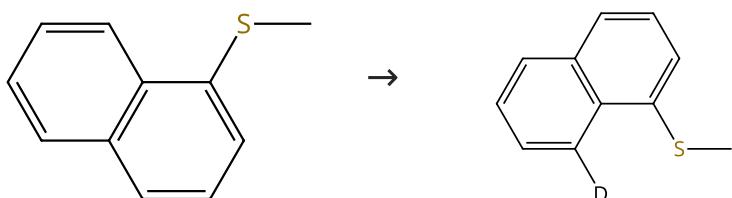


Suppliers (11)

31-614-CAS-26695727	Steps: 1 Yield: 70%	Divergent C-H activation synthesis of chalcones, quinolones and indoles By: Shi, Yuesen; et al Chemical Communications (Cambridge, United Kingdom) (2020), 56(10), 1585-1588.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Silver tetrafluoroborate, Bis[μ-(acetato-κO)bis(acetato-κO)bis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium Solvents: Dichloromethane; 24 h, 80 °C		

Scheme 132 (1 Reaction)

Steps: 1 Yield: 67%



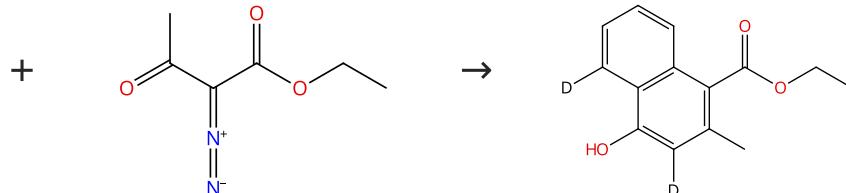
Suppliers (28)

31-614-CAS-31117977	Steps: 1 Yield: 67%	Thioether-directed Rh(III)-catalyzed peri-selective acyloxylation of arenes By: Xie, Hui; et al Organic & Biomolecular Chemistry (2022), 20(3), 565-569.
1.1 Reagents: Methanol- <i>d</i> ₄ , Boric acid (H ₃ BO ₃), Silver oxide (Ag ₂ O) Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,1,1,3,3-Hexafluoro-2-propanol; 5 h, 100 °C Experimental Protocols		

Scheme 133 (1 Reaction)

Steps: 1 Yield: 66%

Multi-component
structure image
available in CAS
SciFinder



Suppliers (41)

31-116-CAS-17430229

Steps: 1 Yield: 66%

1.1 Reagents: Cesium acetate, Water-*d*₂
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*O*-C-6-11)-hexafluoroantimonate(1-) (1:2)
Solvents: Ethanol-*d*₆; 12 h, 120 °C

Divergent Access to 1-Naphthols and Isocoumarins via Rh(III)-Catalyzed C-H Activation Assisted by Phosphonium Ylide

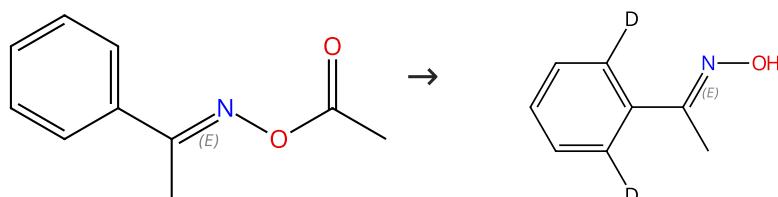
By: Li, Yunyun; et al

Organic Letters (2017), 19(13), 3410-3413.

Experimental Protocols

Scheme 134 (1 Reaction)

Steps: 1 Yield: 65%



Double bond geometry shown

Double bond geometry shown

Suppliers (3)

31-116-CAS-9605152

Steps: 1 Yield: 65%

1.1 Reagents: Sodium acetate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 4 h, 60 °C

Rhodium(III)-Catalyzed Synthesis of Isoquinolines from Aryl Ketone O-Acyloxime Derivatives and Internal Alkynes

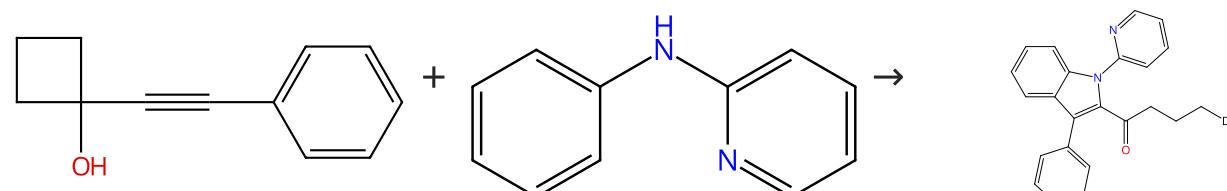
By: Too, Pei-Chui; et al

Organic Letters (2010), 12(24), 5688-5691.

Experimental Protocols

Scheme 135 (1 Reaction)

Steps: 1 Yield: 65%



Suppliers (11)

Suppliers (73)

31-116-CAS-17340686

Steps: 1 Yield: 65%

1.1 Reagents: Silver acetate, Methanol-*d*₄
Catalysts: Tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium(2+)
Solvents: 2-Methyl-2-butanol; 18 h, 50 °C

Rh(III)-Catalyzed Carboamination of Propargyl Cycloalkanols with Arylamines via Csp²-H/Csp³-Csp³ Activation

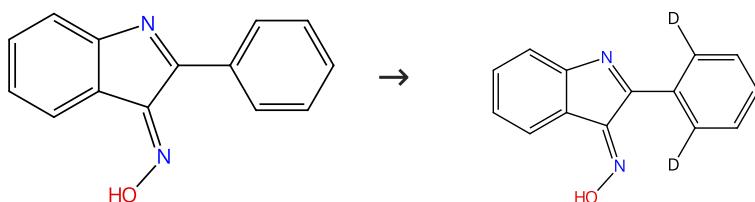
By: Hu, Xinwei; et al

Organic Letters (2017), 19(13), 3474-3477.

Experimental Protocols

Scheme 136 (1 Reaction)

Steps: 1 Yield: 65%



Suppliers (3)

31-614-CAS-31325851

Steps: 1 Yield: 65%

1.1 Reagents: Methanol-*d*₄, 1-Adamantanecarboxylic acid
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Acetonitrile; 12 h, 100 °C

Experimental Protocols

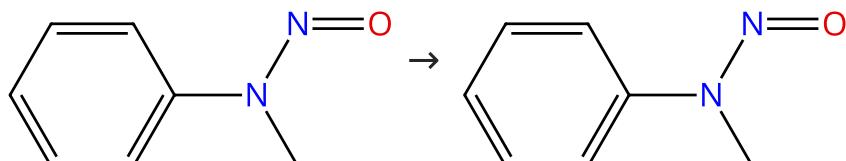
Rhodium(III)-catalyzed successive C(sp²)-H and C(sp²)-C(sp²) bond activation of aryl oximes: synthetic and mechanistic studies

By: Li, Cheng; et al

Organic Chemistry Frontiers (2022), 9(3), 822-830.

Scheme 137 (3 Reactions)

Steps: 1 Yield: 59-64%



Suppliers (75)

31-614-CAS-29908755

Steps: 1 Yield: 64%

1.1 Reagents: Silver acetate, Oxygen
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Ethanol-*d*₆; 24 h, 80 °C

One-pot tandem ortho-naphthoquinone-catalyzed aerobic nitrosation of N-alkylanilines and Rh(III)-catalyzed C-H functionalization sequence to indole and aniline derivatives

By: Si, Tengda; et al

Journal of Organic Chemistry (2021), 86(1), 1152-1163.

31-614-CAS-35036139

Steps: 1 Yield: 59%

1.1 Reagents: *tert*-Butyl peroxide, Sodium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver
Solvents: 1,2-Dichloroethane; 12 h, 100 °C

Experimental Protocols

Expedient delivery of quinolinone drugs via a traceless N-nitroso enabled oxidative Heck/amidation cascade

By: Li, Zhongyuan; et al

Chemical Communications (Cambridge, United Kingdom) (2022), 58(100), 13959-13962.

31-614-CAS-25510169

Steps: 1

1.1 Reagents: Methanol-*d*₄
Catalysts: Acetic acid-*d*₄, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 30 min, 80 °C

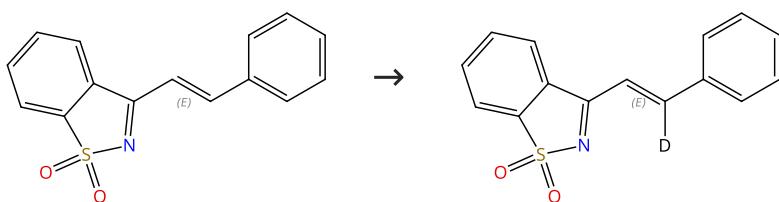
C-H Activation-Based Traceless Synthesis via Electrophilic Removal of a Directing Group. Rhodium(III)-Catalyzed Entry into Indoles from N-Nitroso and α-Diazo-β-keto Compounds

By: Wang, Jie; et al

Organic Letters (2016), 18(5), 1178-1181.

Scheme 138 (1 Reaction)

Steps: 1 Yield: 63%



Double bond geometry shown

31-116-CAS-15388051

Steps: 1 Yield: 63%

- 1.1 **Reagents:** Methanol-*d*₄, Silver tetrafluoroborate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 12 h, 60 °C; 60 °C → rt
- 1.2 **Reagents:** Potassium carbonate
Solvents: Water; neutralized, rt

Highly functionalized pyridines synthesis from N-sulfonyl ketimines and alkynes using the N-S bond as an internal oxidant

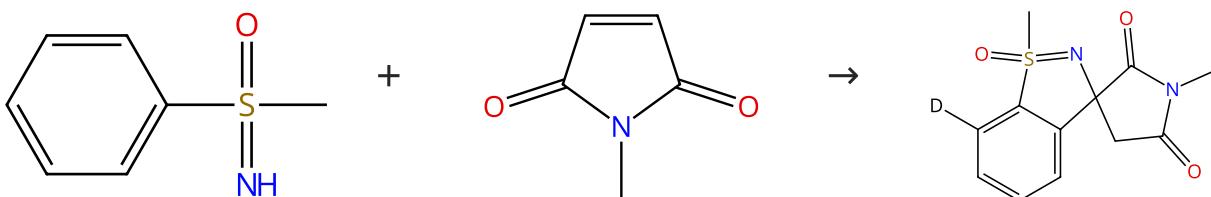
By: Zhang, Qian-Ru; et al

Organic Letters (2014), 16(6), 1684-1687.

Experimental Protocols

Scheme 139 (1 Reaction)

Steps: 1 Yield: 63%



Suppliers (49)

Suppliers (82)

31-614-CAS-35770124

Steps: 1 Yield: 63%

- 1.1 **Reagents:** Acetic acid, Nitrobenzene, Copper diacetate monohydrate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 2,2,2-Trifluoroethanol-*d*; 4 h, 90 °C; 90 °C → rt
- 1.2 **Reagents:** Water; rt

Rh(III)-Catalyzed [4+1] Annulation of Sulfoximines with Maleimides: Access to Benzoisothiazole Spiropyrrolidinediones

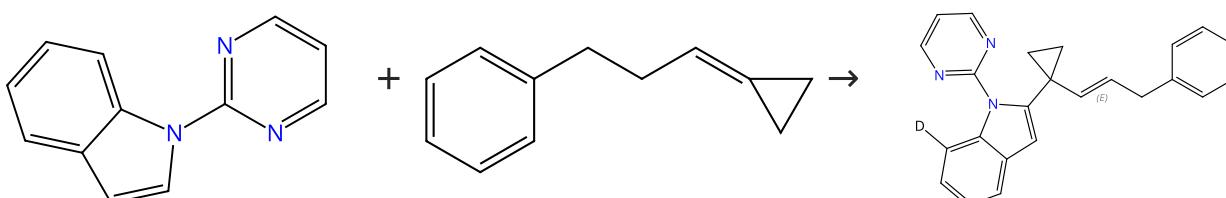
By: Liu, Liansheng; et al

Journal of Organic Chemistry (2023), 88(6), 3626-3635.

Experimental Protocols

Scheme 140 (1 Reaction)

Steps: 1 Yield: 62%



Suppliers (59)

Suppliers (4)

Double bond geometry shown

31-614-CAS-24833107

Steps: 1 Yield: 62%

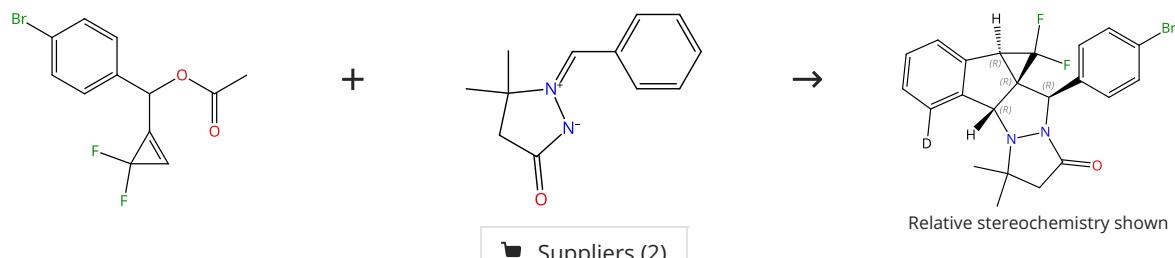
- 1.1 **Reagents:** Pivalic acid, Methanol-*d*₄
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 4 h, 80 °C

TFA-Prompted/Rh(III)-Catalysed Chemoselective C₃- or C₂-H Functionalization of Indoles with Methylenecyclopropanes

By: Wu, Min; et al

European Journal of Organic Chemistry (2021), 2021(40), 5507-5517.

Experimental Protocols

Scheme 141 (1 Reaction)

31-614-CAS-39662897

Steps: 1 Yield: 62%

1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 24 h, 60 °C

Experimental Protocols

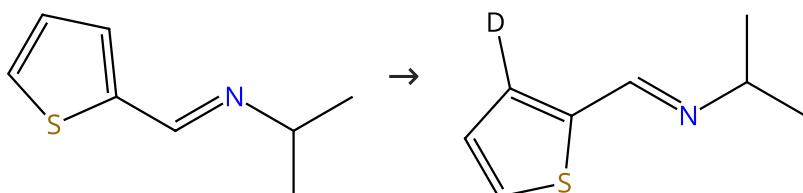
Synthesis of gem-difluorinated pentacyclic indenopyrazolopyrrolones via Rh(iii)-catalyzed cascade C-H functionalization/[3 + 2] dipolar cycloaddition

By: Liu, Fu-Xiaomin; et al

Organic Chemistry Frontiers (2024), 11(9), 2512-2517.

Scheme 142 (1 Reaction)

Steps: 1 Yield: 62%



Suppliers (2)

31-116-CAS-3016701

Steps: 1 Yield: 62%

1.1 Reagents: Sodium acetate

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*; 8 d, rt

Experimental Protocols

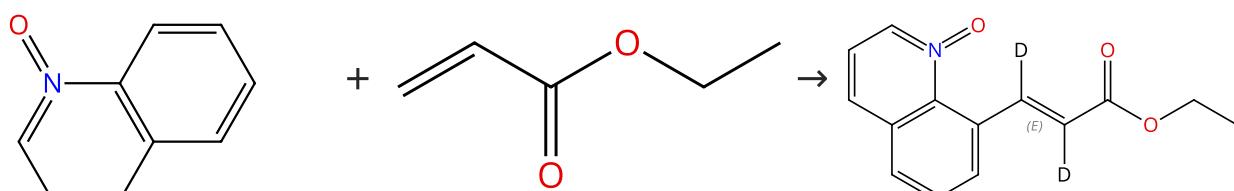
Metal control of selectivity in acetate-assisted C-H bond activation: an experimental and computational study of heterocyclic, vinylic and phenylic C(sp²)-H bonds at Ir and Rh

By: Carr, Kevin J. T.; et al

Chemical Science (2014), 5(6), 2340-2346.

Scheme 143 (1 Reaction)

Steps: 1 Yield: 61%



Suppliers (57)

Suppliers (76)

Double bond geometry shown

31-116-CAS-19783159

Steps: 1 Yield: 61%

Rh/O₂-Catalyzed C8 Olefination of Quinoline N-Oxides with Activated and Unactivated Olefins

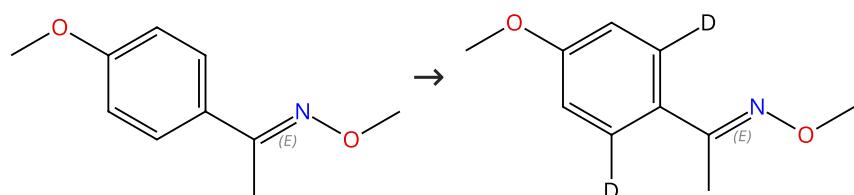
By: Sharma, Ritika; et al

Journal of Organic Chemistry (2019), 84(5), 2786-2797.

Experimental Protocols

Scheme 144 (1 Reaction)

Steps: 1 Yield: 61%



Double bond geometry shown

Double bond geometry shown

Suppliers (3)

31-116-CAS-15047132

Steps: 1 Yield: 61%

- 1.1 Reagents:** Silver carbonate, Methanol-*d*₄, [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl-*κO*]methanesulfonamido-*κO*]silver
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Dichloromethane, 1,2-Dichloroethane; 5 h, 120 °C

Rhodium-Catalyzed Direct C-H Phosphorylation of Heteroarenes Suitable for Late-Stage Functionalization

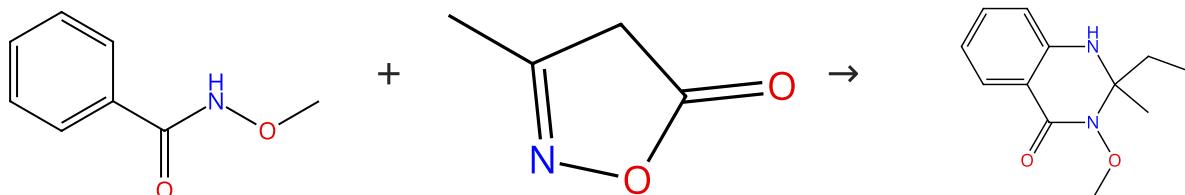
By: Min, Minsik; et al

Advanced Synthesis & Catalysis (2016), 358(8), 1296-1301.

Experimental Protocols

Scheme 145 (1 Reaction)

Steps: 1 Yield: 60%



Suppliers (49)

Suppliers (17)

31-614-CAS-31487515

Steps: 1 Yield: 60%

- 1.1 Reagents:** Acetic acid, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethan-1,1-*d*₂-ol-*d*; 5 h, 100 °C

Rh-Catalysed cascade C-H imidization/cyclization of N-methoxybenzamides with isoxazolones for the assembly of dihydroquinazolin-4(1H)-one derivatives

By: Zhong, Xiuhua; et al

Organic Chemistry Frontiers (2022), 9(7), 1904-1910.

Experimental Protocols

Scheme 146 (1 Reaction)

Steps: 1 Yield: 60%

**31-614-CAS-34442410**

Steps: 1 Yield: 60%

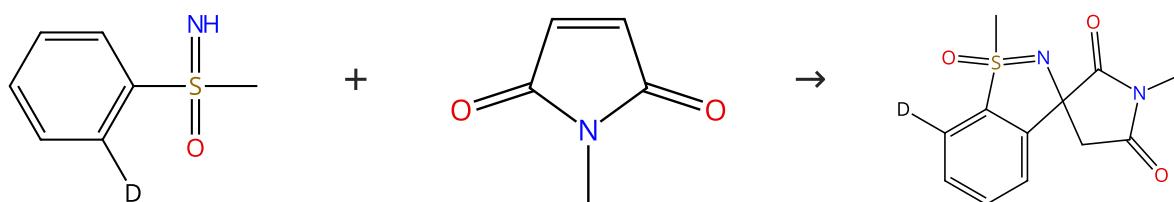
- 1.1 Reagents:** Methanol-*d*₄, Silver fluoride
Catalysts: Cupric acetate, Silver acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Tetrahydrofuran; 24 h, 80 °C

Thioamide-Directed Transition-Metal-Catalyzed C(sp²)-H Vinylation and Arylation of Ferrocenes

By: Li, Hao; et al

Advanced Synthesis & Catalysis (2022), 364(17), 2926-2931.

Scheme 147 (1 Reaction)



Suppliers (82)

31-614-CAS-35770130

Steps: 1 Yield: 58%

1.1 **Reagents:** Acetic acid, Nitrobenzene, Copper diacetate monohydrate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 2,2,2-Trifluoroethanol-d; 4 h, 90 °C; 90 °C → rt

Rh(III)-Catalyzed [4+1] Annulation of Sulfoximes with Maleimides: Access to Benzoisothiazole Spiropyrrolidinediones

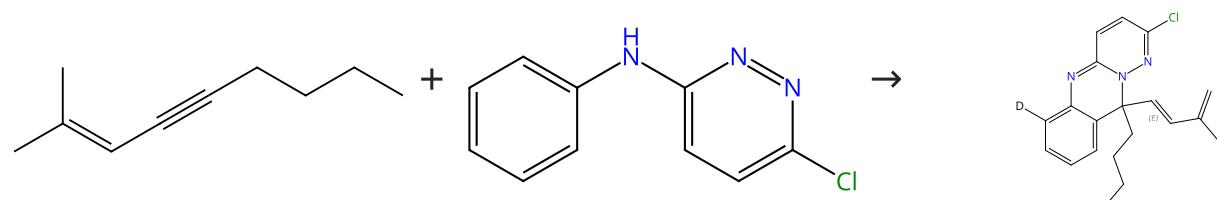
By: Liu, Liansheng; et al

Journal of Organic Chemistry (2023), 88(6), 3626-3635.

1.2 **Reagents:** Water; rt

Experimental Protocols

Scheme 148 (1 Reaction)



Supplier (1)

Suppliers (48)

Double bond geometry shown

31-614-CAS-35962680

Steps: 1 Yield: 57%

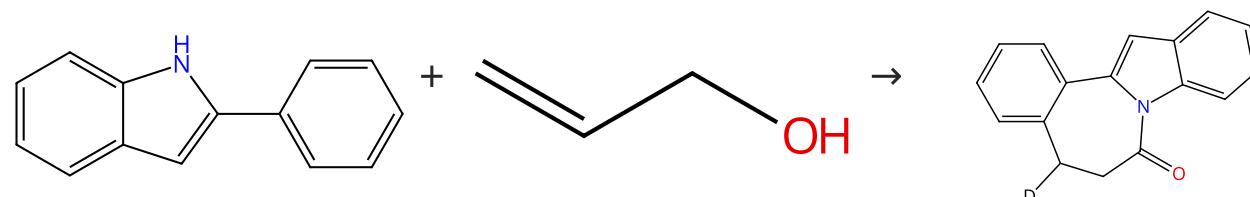
1.1 **Reagents:** Cupric acetate, Methanol-d
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 5 h, rt

Asymmetric [5+1] Annulation via C-H Activation/1,4-Rh Migration/Double Bond Shift Using a Transfomerable Pyridazine Directing Group

By: Zhu, Man; et al

Organic Letters (2023), 25(11), 1839-1844.

Scheme 149 (1 Reaction)



Suppliers (88)

Suppliers (46)

31-085-CAS-23896714

Steps: 1 Yield: 57%

1.1 **Reagents:** Sodium acetate, Methanol-d₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Acetonitrile; 12 h, 60 °C

Synthesis of Indolo[2,1-a]benzazepinones through Rhodium-Catalyzed Cascade Reactions of 2-Arylindoles with Allyl Alcohols

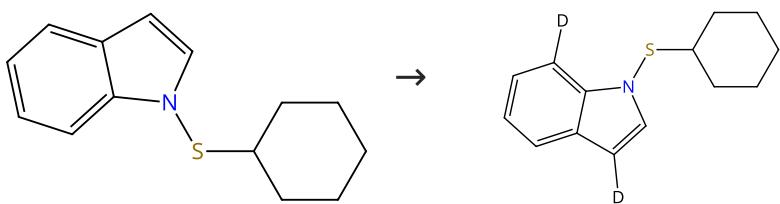
By: Wang, Yu-Jiao; et al

Organic Letters (2021), 23(16), 6272-6277.

Experimental Protocols

Scheme 150 (1 Reaction)

Steps: 1 Yield: 57%



31-116-CAS-23889391

Steps: 1 Yield: 57%

1.1 Reagents: Methanol-*d*₄Catalysts: Bis(acetato- κO)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium; 5 h, 70 °C

Experimental Protocols

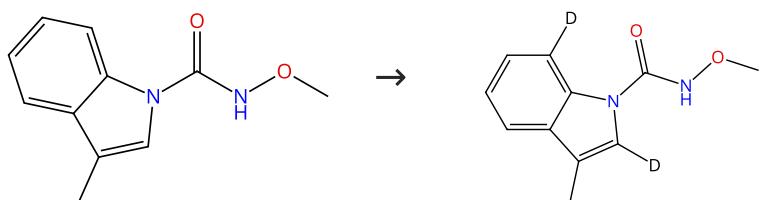
Sulfur-Directed C₇-Selective Alkenylation of Indoles under Rhodium Catalysis

By: Kona, Chandrababu Naidu; et al

Organic Letters (2021), 23(16), 6252-6256.

Scheme 151 (1 Reaction)

Steps: 1 Yield: 55%



Supplier (1)

31-614-CAS-40488974

Steps: 1 Yield: 55%

1.1 Reagents: Potassium acetate, Methanol-*d*₄Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 0.5 h, 80 °C

Experimental Protocols

Synthesis of CF₃-Substituted N-Heterocyclic Compounds

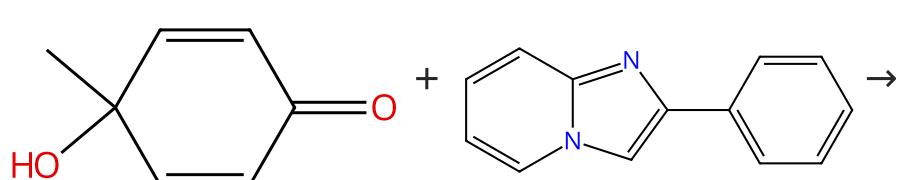
Based on C-H Activation-Initiated Formal [2 + 3] Annulation Featuring with a Latent Nucleophilic Site

By: Wang, Manqing; et al

Journal of Organic Chemistry (2024), 89(11), 7828-7842.

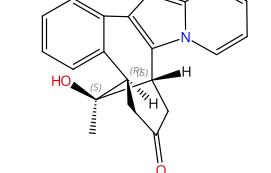
Scheme 152 (1 Reaction)

Steps: 1 Yield: 55%



Supplier (8)

Supplier (83)



Relative stereochemistry shown

31-614-CAS-37287198

Steps: 1 Yield: 55%

1.1 Reagents: Methanol-*d*₄, Silver hexafluoroantimonateCatalysts: Sodium acetate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]

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

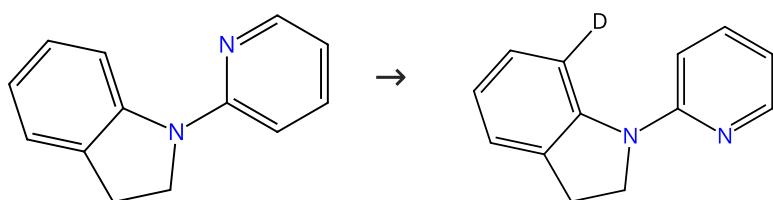
Rh-Catalyzed Twofold Conjugate Addition of 2-Arylimidazo[1,2-a]pyridines to p-Quinols To Access Bridged Scaffolds with Three Contiguous Stereocenters

By: Battula, Shravani; et al

Journal of Organic Chemistry (2023), 88(15), 10986-10995.

Scheme 153 (1 Reaction)

Steps: 1 Yield: 55%



Suppliers (7)

31-116-CAS-10630647

Steps: 1 Yield: 55%

1.1 **Reagents:** Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 12 h, 100 °C

Rhodium(III)-catalyzed C7-position C-H alkenylation and alkynylation of indolines

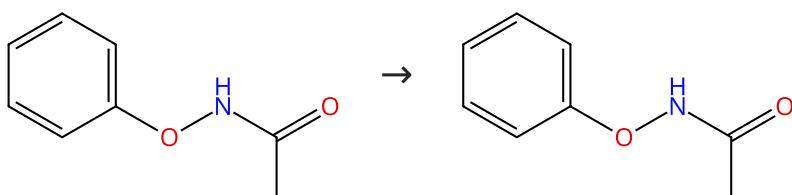
By: Yang, Xiao-Fei; et al

Chemical Communications (Cambridge, United Kingdom)
(2015), 51(13), 2532-2535.

Experimental Protocols

Scheme 154 (1 Reaction)

Steps: 1 Yield: 55%



Suppliers (11)

31-614-CAS-25324751

Steps: 1 Yield: 55%

1.1 **Reagents:** Cesium acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Acetonitrile, Methanol-*d*₄; 24 h, 60 °C

2H-Chromene-3-carboxylic Acid Synthesis via Solvent-Controlled and Rhodium(III)-Catalyzed Redox-Neutral C-H Activation/[3 + 3] Annulation Cascade

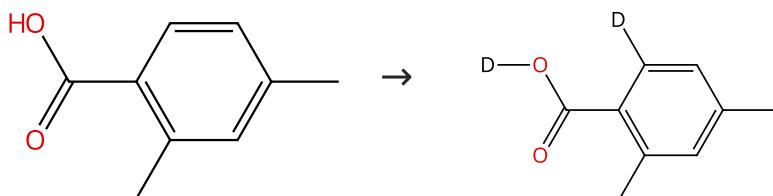
By: Zhou, Zhi; et al

Organic Letters (2018), 20(13), 3892-3896.

Experimental Protocols

Scheme 155 (1 Reaction)

Steps: 1 Yield: 54%



Suppliers (92)

31-116-CAS-4872938

Steps: 1 Yield: 54%

1.1 **Reagents:** Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 20 min, 60 °C

[Rh^{III}(Cp*)]-catalyzed ortho-selective direct C(sp²)-H bond amidation/amination of benzoic acids by N-chlorocarbamates and N-chloromorpholines. A versatile synthesis of functionalized anthranilic acids

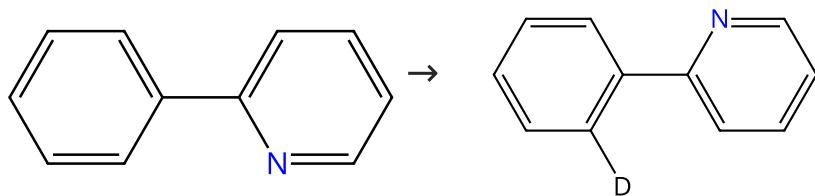
By: Ng, Fo-Ning; et al

Chemistry - A European Journal (2014), 20(15), 4474-4480.

Experimental Protocols

Scheme 156 (2 Reactions)

Steps: 1 Yield: 53%



Suppliers (94)

Suppliers (6)

31-116-CAS-11420448

Steps: 1 Yield: 53%

1.1 Reagents: Sodium acetate**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Propanoic acid-*d*, 2,2-dimethyl-**Solvents:** Methanol-*d*₄, 8 d, rt**Experimental Protocols****Metal control of selectivity in acetate-assisted C-H bond activation: an experimental and computational study of heterocyclic, vinylic and phenylic C(sp²)-H bonds at Ir and Rh**

By: Carr, Kevin J. T.; et al

Chemical Science (2014), 5(6), 2340-2346.

31-116-CAS-19082546

Steps: 1

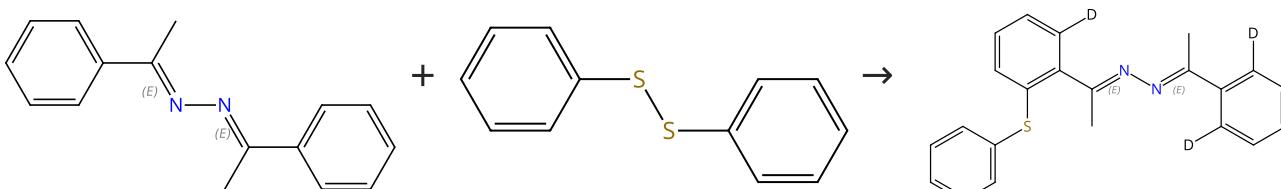
1.1 Reagents: Silver acetate, [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl]- κO]methanesulfonamido- κO silver**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]**Solvents:** Methanol-*d*₄, 1-Butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide; 4 h, 30 °C**Rhodium-Catalyzed Direct C-H Bond Cyanation in Ionic Liquids**

By: Lv, Songyang; et al

Organic Letters (2018), 20(16), 4994-4997.

Scheme 157 (1 Reaction)

Steps: 1 Yield: 53%



Double bond geometry shown

Suppliers (95)

Double bond geometry shown

Suppliers (7)

31-116-CAS-3783815

Steps: 1 Yield: 53%

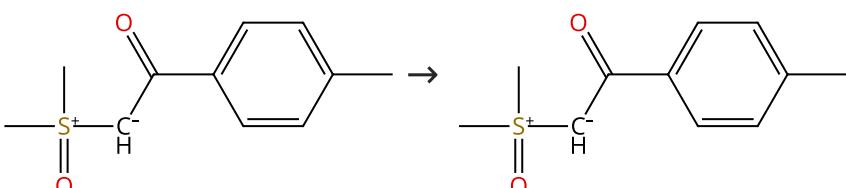
1.1 Reagents: Cupric acetate**Catalysts:** Silver triflate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]**Solvents:** 1,2-Dichloroethane, Methanol-*d*₄; 24 h, 60 °C**Experimental Protocols****Rhodium(III)-Catalyzed Directed ortho-C-H Bond Functionalization of Aromatic Ketazines via C-S and C-C Coupling**

By: Wen, Jing; et al

Journal of Organic Chemistry (2015), 80(21), 10457-10463.

Scheme 158 (1 Reaction)

Steps: 1 Yield: 52%



Supplier (1)

31-614-CAS-25405499

Steps: 1 Yield: 52%

1.1 Reagents: Sodium acetate

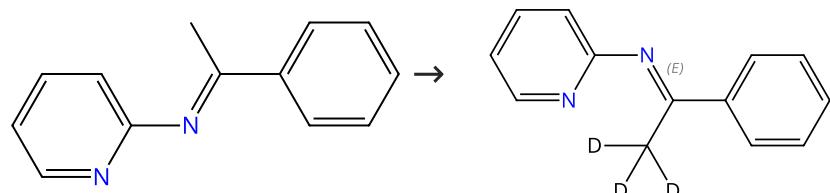
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: 2-Propan-2-d-ol-*d*, 1,1,1,3,3-hexafluoro-; 15 min, 100 °CRh(III)-Catalyzed Reaction of α -Carbonyl Sulfoxonium Ylides and Alkenes: Synthesis of Indanones via [4 + 1] Cycloaddition

By: Kommagalla, Yadagiri; et al

Organic Letters (2020), 22(4), 1375-1379.

Scheme 159 (1 Reaction)

Steps: 1 Yield: 51%



Suppliers (3)

Double bond geometry shown

31-116-CAS-11912748

Steps: 1 Yield: 51%

1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Acetonitrile; 8 h, 80 °C

Rh(III)-catalyzed chelation-assisted intermolecular carbenoid functionalization of α -imino Csp³-H bonds

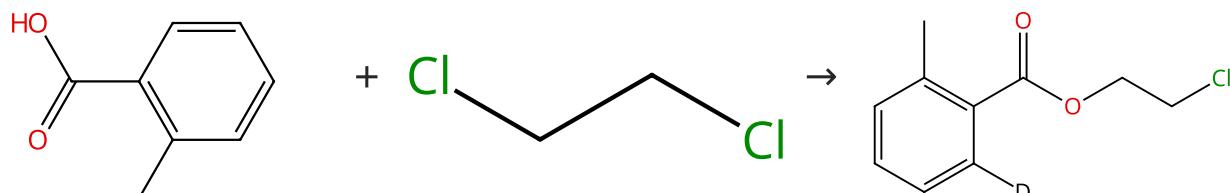
By: Chen, Xun; et al

Chemical Communications (Cambridge, United Kingdom) (2015), 51(83), 15328-15331.

Experimental Protocols

Scheme 160 (1 Reaction)

Steps: 1 Yield: 50%



Suppliers (92)

Suppliers (181)

31-614-CAS-33607423

Steps: 1 Yield: 50%

1.1 Reagents: Potassium bicarbonate, Methanol-*d*₄, Silver oxide (Ag₂O)Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 16 h, 90 °C

Rh^{III}-Catalyzed C-H N-Heteroarylation and Esterification

Cascade of Carboxylic Acid with Organoboron Reagents and 1,2-Dichloroethane in One-Pot Synthesis

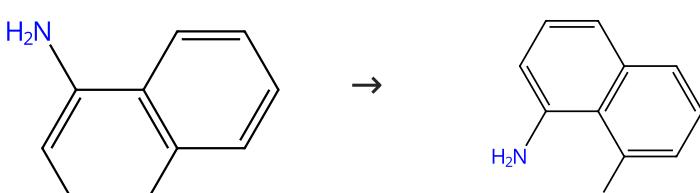
By: Wang, Huai-Wei; et al

Organic Letters (2022), 24(31), 5704-5709.

Experimental Protocols

Scheme 161 (1 Reaction)

Steps: 1 Yield: 50%

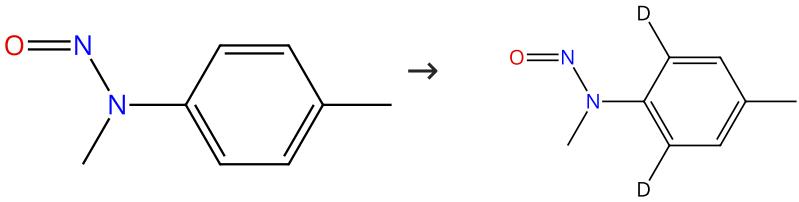


Suppliers (73)

31-614-CAS-32063961	Steps: 1 Yield: 50%	Cp*Rh(III)-catalyzed and solvent-controlled tunable [4 + 1]/[4 + 3] annulation for the divergent assembly of dihydrobenzo[cd]indoles and dihydronaphtho[1,8-bc]azepines By: Zhang, Zhuo-Zhuo; et al Organic Chemistry Frontiers (2022), 9(12), 3262-3267.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium(2+) Solvents: Acetonitrile, 1,2-Dichloroethane; 24 h, 90 °C Experimental Protocols		

Scheme 162 (1 Reaction)	Steps: 1 Yield: 50%
	

31-116-CAS-22835104	Steps: 1 Yield: 50%	Thioketone-directed rhodium(I) catalyzed enantioselective C-H bond arylation of ferrocenes By: Cai, Zhong-Jian; et al Nature Communications (2019), 10(1), 1-8.
1.1 Reagents: Methanol- <i>d</i> ₄ , Lithium <i>tert</i> -butoxide, (3 <i>aR</i> ,8 <i>aR</i>)-Tetrahydro-2,2-dimethyl-4,4,6,8,8-pentaphenyl-1,3-dioxolo[4,5- <i>e</i>][1,3,2]dioxaphosphhepin Catalysts: Di-μ-chlorotetrakis(η ² -ethene)dirhodium Solvents: 1,4-Dioxane; 4 h, 80 °C Experimental Protocols		

Scheme 163 (2 Reactions)	Steps: 1 Yield: 50%
	

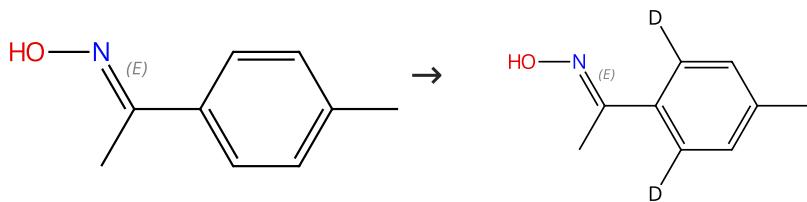
 Suppliers (11)

31-614-CAS-31840129	Steps: 1 Yield: 50%	Modular construction of functionalized anilines via switchable C-H and N-alkylations of traceless N-nitroso anilines with olefins By: Ouyang, Wensen; et al Organic Chemistry Frontiers (2022), 9(10), 2746-2752.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Cupric acetate, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamido-κO]silver Solvents: 1,2-Dichloroethane; 12 h, 60 °C Experimental Protocols		

31-116-CAS-19019414	Steps: 1	Regioselective Synthesis of 2-Alkenylindoles and 2-Alkenyl indole-3-carboxylates through the Cascade Reactions of N-Nitrosoanilines with Propargyl Alcohols By: Song, Xia; et al Journal of Organic Chemistry (2018), 83(15), 8509-8521.
1.1 Reagents: Silver acetate, Methanol- <i>d</i> ₄ , Silver hexafluoro antimonate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: 1,2-Dichloroethane; 40 min, 120 °C; 120 °C → rt Experimental Protocols		

Scheme 164 (1 Reaction)

Steps: 1 Yield: 48%



Double bond geometry shown

Double bond geometry shown

 Suppliers (14)
31-614-CAS-34705408

Steps: 1 Yield: 48%

- 1.1 **Reagents:** Cupric acetate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Dichloromethane, Methanol- d_4 ; 6 h, 80 °C
- 1.2 **Solvents:** Water; rt

Rhodium-Catalyzed Oxidative Coupling of Potassium Vinyltrifluoroborate with Arenes: A Direct Access to Functionalized Styrene Derivatives

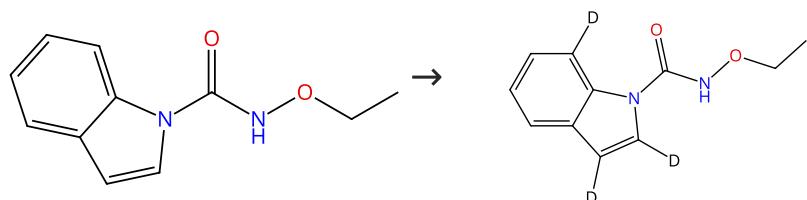
By: Ma, Wenbo; et al

Advanced Synthesis & Catalysis (2022), 364(22), 3881-3887.

Experimental Protocols

Scheme 165 (2 Reactions)

Steps: 1 Yield: 46%


 Supplier (1)
31-116-CAS-20192538

Steps: 1 Yield: 46%

- 1.1 **Reagents:** Sodium acetate, Methanol- d_4
Catalysts: Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium
Solvents: Toluene; 9 h, rt

Cp*Rh(III)-Catalyzed C-H Bond Difluorovinylation of Indoles with α,α -Difluorovinyl Tosylate

By: Yang, Lisheng; et al

Journal of Organic Chemistry (2019), 84(11), 7320-7330.

31-116-CAS-20081690

Steps: 1

Rh(III)-Catalyzed Hydroarylation of Alkyne MIDA Boronates via C-H Activation of Indole Derivatives

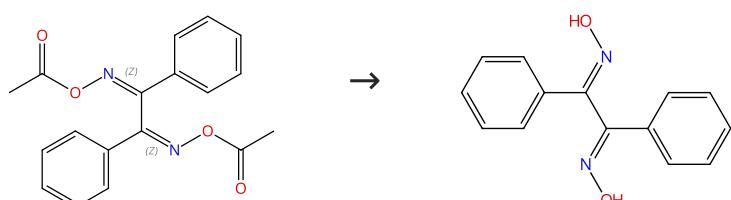
- 1.1 **Reagents:** Sodium acetate, Methanol- d_4
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 20 h, 50 °C

By: Fei, Xiao; et al

Journal of Organic Chemistry (2019), 84(11), 6840-6850.

Scheme 166 (1 Reaction)

Steps: 1 Yield: 46%



Double bond geometry shown

 Supplier (1)

31-614-CAS-29716108

Steps: 1 Yield: 46%

1.1 Reagents: Sodium acetate

Catalysts: *p*-Toluenesulfonic acid, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*₄; 0.5 h, 100 °C

Experimental Protocols

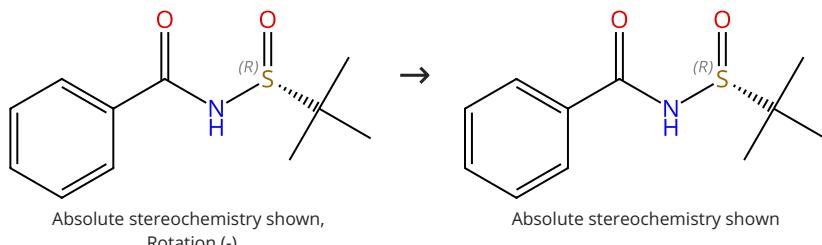
The C-H Activation/Bidirecting Group Strategy for Selective Direct Synthesis of Diverse 1,1'-Biisoquinolines

By: Li, Shiqing; et al

Organic Letters (2020), 22(11), 4207-4212.

Scheme 167 (1 Reaction)

Steps: 1 Yield: 45%



31-614-CAS-27469679

Steps: 1 Yield: 45%

1.1 Reagents: Cupric acetate, Silver carbonate, 2-Propan-2-*d*-ol-*d*, 1,1,1,3,3-hexafluoro-Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 16 h, 80 °C

1.2 Solvents: Ethyl acetate

Experimental Protocols

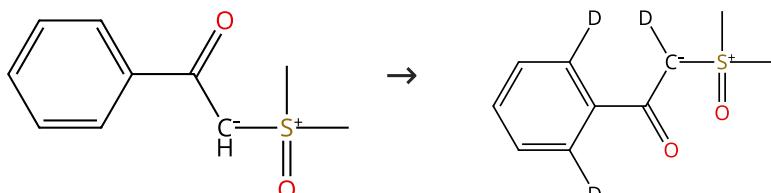
Diastereoselective synthesis of chiral 3-substituted isoindolinones via rhodium(III)-catalyzed oxidative C-H olefination/annulation

By: Li, Xue-Hong; et al

Organic & Biomolecular Chemistry (2021), 19(26), 5876-5887.

Scheme 168 (3 Reactions)

Steps: 1 Yield: 45%



Suppliers (38)

31-116-CAS-20801479

Steps: 1 Yield: 45%

1.1 Reagents: Chloroacetic acid, Methanol-*d*₄, [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl- κO]methanesulfonamido- κO]silverCatalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]

Solvents: Ethyl acetate; 20 min, 80 °C

Synthesis of Naphthols by Rh(III)-Catalyzed Domino C-H Activation, Annulation, and Lactonization Using Sulfoxonium Ylide as a Traceless Directing Group

By: Hanchate, Vinayak; et al

Organic Letters (2019), 21(20), 8424-8428.

31-614-CAS-31118222

Steps: 1

1.1 Reagents: Methanol-*d*₄, Propanoic acid, 2,2-dimethyl-, sodium salt (1:1)Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,1,1,3,3,3-Hexafluoro-2-propanol; 1 h, 40 °C

Experimental Protocols

Rh(III)-catalyzed C-H annulation of sulfoxonium ylides with iodonium ylides towards isocoumarins

By: Yin, Chuanliu; et al

Organic & Biomolecular Chemistry (2022), 20(5), 1112-1116.

31-116-CAS-22218832

Steps: 1

1.1 Reagents: Acetic acid, Zinc acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver tetrafluoroborate
Solvents: Acetone; 30 min, 100 °C

Experimental Protocols

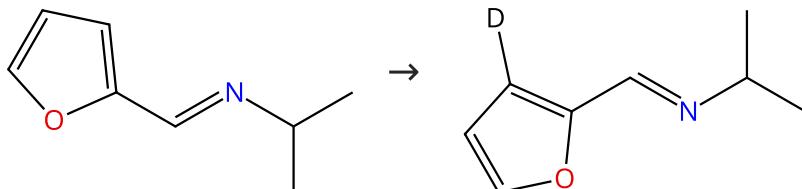
Rh(III)-Catalyzed sequential ortho-C-H oxidative arylation/cyclization of sulfoxonium ylides with quinones toward 2-hydroxy-dibenzo[b,d]pyran-6-ones

By: Dong, Yaqun; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(49), 6688-6691.

Scheme 169 (1 Reaction)

Steps: 1 Yield: 44%


🛒 Suppliers (3)

31-116-CAS-6931252

Steps: 1 Yield: 44%

1.1 Reagents: Sodium acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Propanoic acid-*d*, 2,2-dimethyl-*d*₂
Solvents: Methanol-*d*₄; 13 d, rt

Experimental Protocols

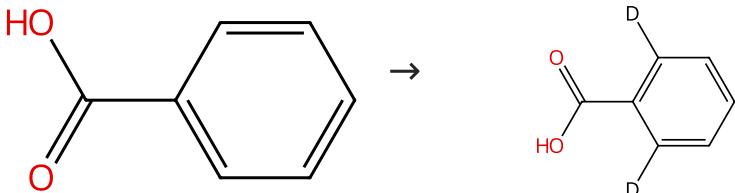
Metal control of selectivity in acetate-assisted C-H bond activation: an experimental and computational study of heterocyclic, vinylic and phenylic C(sp²)-H bonds at Ir and Rh

By: Carr, Kevin J. T.; et al

Chemical Science (2014), 5(6), 2340-2346.

Scheme 170 (2 Reactions)

Steps: 1 Yield: 44%


🛒 Suppliers (193)

🛒 Suppliers (6)

31-116-CAS-4024965

Steps: 1 Yield: 44%

1.1 Reagents: Methanol-*d*₄, Dipotassium phosphate, Silver oxide (Ag₂O)
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: *tert*-Butanol; 10 min, rt; 1 h, 130 °C

Experimental Protocols

Rhodium(III)-Catalyzed ortho C-H Heteroarylation of (Hetero)aromatic Carboxylic Acids: A Rapid and Concise Access to π-Conjugated Poly-heterocycles

By: Qin, Xurong; et al

Angewandte Chemie, International Edition (2015), 54(24), 7167-7170.

31-116-CAS-23135568

Steps: 1

1.1 Reagents: Pivalic acid, Methanol-*d*₄, Cesium acetate, Oxygen
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 2 h, 80 °C

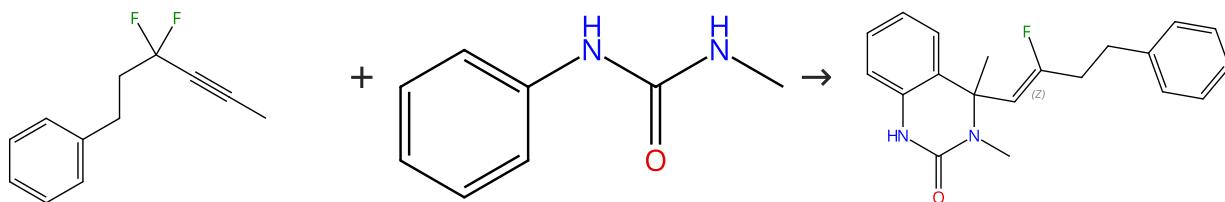
gem-Difluoromethylene Alkyne-Enabled Diverse C-H Functionalization and Application to the on-DNA Synthesis of Difluorinated Isocoumarins

By: Gao, Hui; et al

Angewandte Chemie, International Edition (2021), 60(4), 1959-1966.

Scheme 171 (1 Reaction)

Steps: 1 Yield: 43%



Suppliers (40)

Double bond geometry shown

31-614-CAS-29877284

Steps: 1 Yield: 43%

1.1 Reagents: Zinc acetate, Silver hexafluoroantimonate, 2,2,2-Trifluoroethan-1,1-d₂-ol-dCatalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 24 h, 100 °C

Experimental Protocols

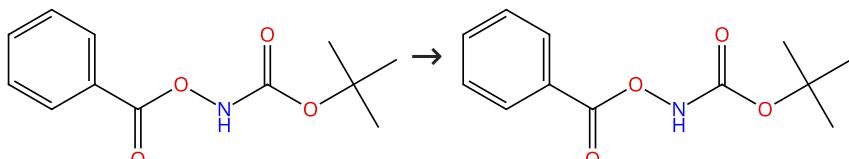
Rh(III)-Catalyzed Chemoselective C-H Alkenylation and [5 + 1] Annulation with Gem-Difluoromethylene Enabled by the Distinctive Fluorine Effect

By: Yang, Jian; et al

Journal of Organic Chemistry (2021), 86(14), 9711-9722.

Scheme 172 (1 Reaction)

Steps: 1 Yield: 43%



Suppliers (31)

31-614-CAS-33608179

Steps: 1 Yield: 43%

1.1 Reagents: Methanol-d₄Catalysts: Silver acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 2,2,2-Trifluoroethanol; 2 h, 60 °C

Experimental Protocols

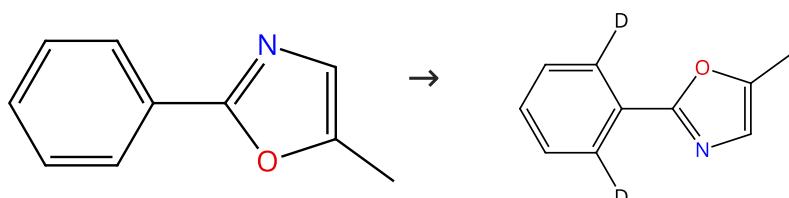
Rhodium-Catalyzed Selective C(sp²)-H Activation/Annulation of tert-Butyl Benzoyloxycarbamates with 1,3-Dynes: A One Step Access to Alkynylated Isocoumarins and Bis-Isocoumarins

By: Pati, Bedadyuti Vedvyas; et al

Organic Letters (2022), 24(31), 5651-5656.

Scheme 173 (1 Reaction)

Steps: 1 Yield: 43%



Suppliers (21)

31-614-CAS-35326996

Steps: 1 Yield: 43%

1.1 Reagents: Cupric acetate, Methanol-d₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver; 12 h, 100 °C

Experimental Protocols

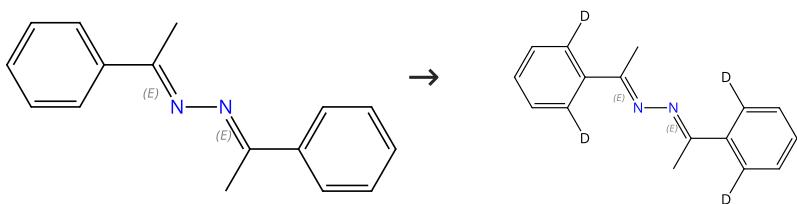
Highly-Selective Construction of Aza-Fused Pyrrolo Isoquinoline Derivatives

By: Zheng, Jing; et al

European Journal of Organic Chemistry (2023), 26(3), e202201267.

Scheme 174 (1 Reaction)

Steps: 1 Yield: 43%



Double bond geometry shown

Double bond geometry shown

Suppliers (7)

31-116-CAS-15060577

Steps: 1 Yield: 43%

1.1 Reagents: Cupric acetate

Catalysts: Silver triflate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: 1,2-Dichloroethane, Methanol-*d*₄; 24 h, 60 °C**Rhodium(III)-Catalyzed Directed ortho-C-H Bond Functionalization of Aromatic Ketazines via C-S and C-C Coupling**

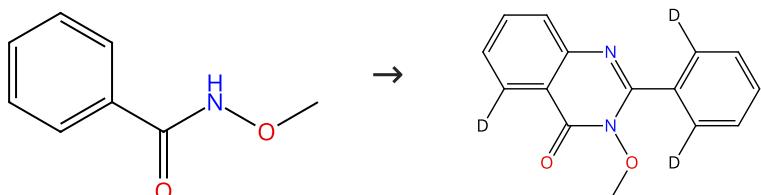
By: Wen, Jing; et al

Journal of Organic Chemistry (2015), 80(21), 10457-10463.

Experimental Protocols

Scheme 175 (1 Reaction)

Steps: 1 Yield: 42%



Suppliers (49)

31-614-CAS-31940258

Steps: 1 Yield: 42%

1.1 Reagents: Methanol-*d*₄, Silver hexafluoroantimonateCatalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Hexane; 18 h, 150 °C

Rhodium(III)-Catalyzed Synthesis of Quinazolin-4(3H)-ones with N-Methoxyamides as Synthesis Reagents

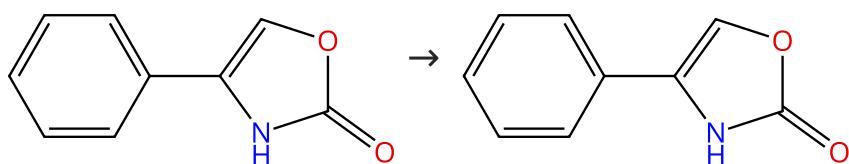
By: Zhou, Guanyu; et al

Synthesis (2022), 54(14), 3298-3306.

Experimental Protocols

Scheme 176 (1 Reaction)

Steps: 1 Yield: 41%



Suppliers (21)

31-614-CAS-31246655

Steps: 1 Yield: 41%

1.1 Reagents: Sodium acetate

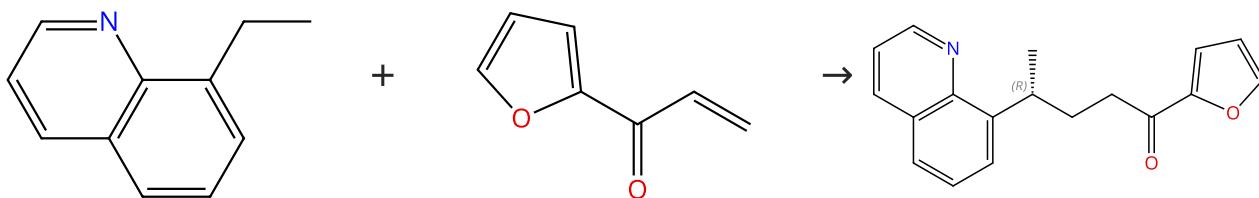
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: 1,1,1,3,3-Hexafluoro-2-propanol, 2-Propan-2-*d*-ol-*d*, 1,1,1,3,3-hexafluoro-; 15 h, 100 °C**Spiro[indene-1,4'-oxa-zolidinones] Synthesis via Rh(III)-Catalyzed Coupling of 4-Phenyl-1,3-oxazol-2(3H)-ones with Alkynes: A Redox-Neutral Approach**

By: Liu, Zhongsu; et al

Journal of Organic Chemistry (2019), 84(18), 11945-11957.

Scheme 177 (1 Reaction)

Steps: 1 Yield: 40%



Suppliers (64)

Suppliers (17)

Absolute stereochemistry shown

31-614-CAS-30091365

Steps: 1 Yield: 40%

1.1 Reagents: Methanol-*d*₄Catalysts: Silver carbonate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluorophosphate, 2398498-52-5

Solvents: Chlorobenzene; 24 h, 30 °C

Rhodium(III)/Chiral Carboxylic Acid Catalyzed Enantioselective C(sp³)-H Alkylation of 8-Ethylquinolines with α,β-Unsaturated Carbonyl Compounds

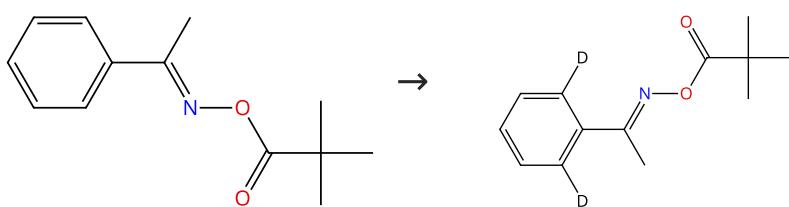
By: Huang, Long-Tao; et al

Organic Letters (2020), 22(21), 8256-8260.

Experimental Protocols

Scheme 178 (1 Reaction)

Steps: 1 Yield: 40%



Supplier (1)

31-116-CAS-18780475

Steps: 1 Yield: 40%

1.1 Reagents: Sodium acetate, Methanol-*d*₄

Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2)

Solvents: Dichloromethane; 15 h, 60 °C

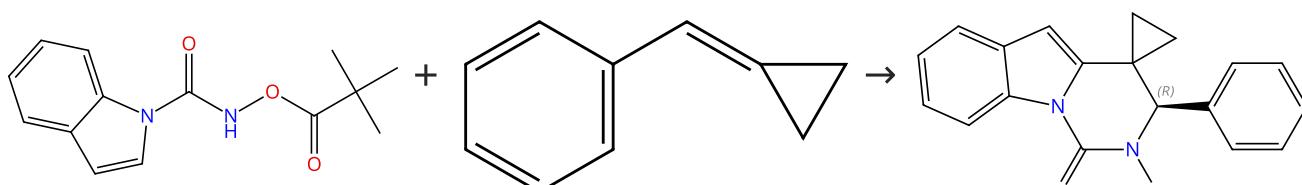
Redox-Neutral Access to Isoquinolinones via Rhodium(III)-Catalyzed Annulations of O-Pivaloyl Oximes with Ketenes

By: Yang, Xifa; et al

Organic Letters (2018), 20(9), 2698-2701.

Scheme 179 (1 Reaction)

Steps: 1 Yield: 40%



Supplier (20)

Absolute stereochemistry shown

31-614-CAS-39111550

Steps: 1 Yield: 40%

1.1 Reagents: Sodium carbonate

Catalysts: Di-μ-chlorodichlorobis[(3a,4,5,6,6a-η)-(13b-*R*)-3,7-dihydro-4,5,6-trimethyl-3a-*H*-cyclopenta[6,7]cycloocta[2,1-*a*:3,4-*a'*]dinaphthalen-3a-yl]dirhodiumSolvents: Methanol-*d*₄; 6 h, 25 °C

The synthesis of spirocyclopropane skeletons enabled by Rh(II)-catalyzed enantioselective C-H activation/[4 + 2] annulation

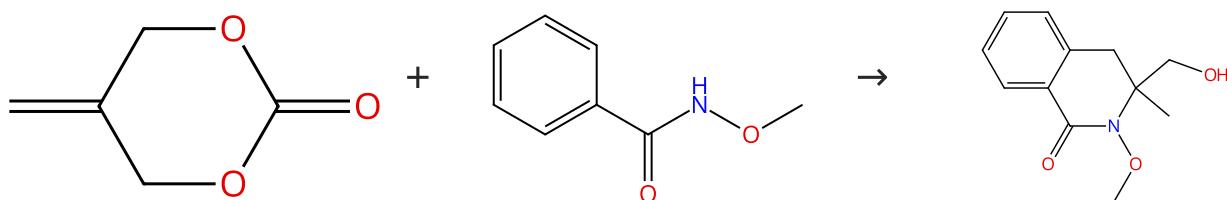
By: Wang, Hao; et al

Chem Catalysis (2023), 3(12), 100822.

Experimental Protocols

Scheme 180 (1 Reaction)

Steps: 1 Yield: 40%



Suppliers (4)

Suppliers (49)

31-614-CAS-24825459

Steps: 1 Yield: 40%

1.1 Reagents: Sodium bicarbonate, Methanol-*d*₄
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 10 h, 80 °C

Experimental Protocols

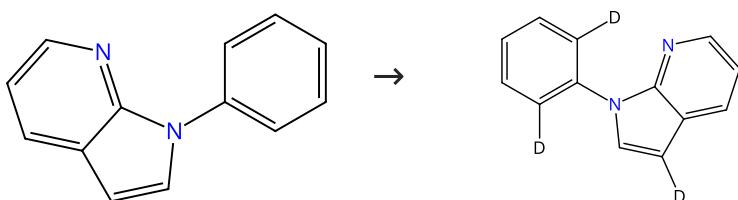
Mild Synthesis of 3,4-Dihydroisoquinolin-1(2H)-ones via Rh(III)-Catalyzed Tandem C-H-Allylation/N-Alkylation Annulation with 2-Methylidenetrimethylene Carbonate

By: Xie, Hui; et al

Journal of Organic Chemistry (2021), 86(23), 17063-17070.

Scheme 181 (1 Reaction)

Steps: 1 Yield: 40%



Suppliers (6)

31-116-CAS-18701922

Steps: 1 Yield: 40%

1.1 Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 12 h, 120 °C

Experimental Protocols

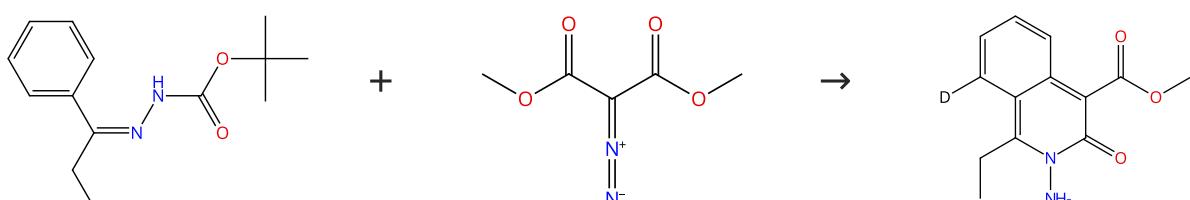
Ru(II)-Catalyzed C-H Aminocarbonylation of N-(Hetero)aryl-7-azaindoles with Isocyanates

By: Jeong, Taejoo; et al

Journal of Organic Chemistry (2018), 83(8), 4641-4649.

Scheme 182 (1 Reaction)

Steps: 1 Yield: 40%



Suppliers (5)

Suppliers (30)

31-116-CAS-17609510

Steps: 1 Yield: 40%

1.1 Catalysts: Acetic acid-*d*₄, Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 2,2,2-Trifluoroethan-1,1-*d*₂-ol-*d*; 12 h, 80 °C

Experimental Protocols

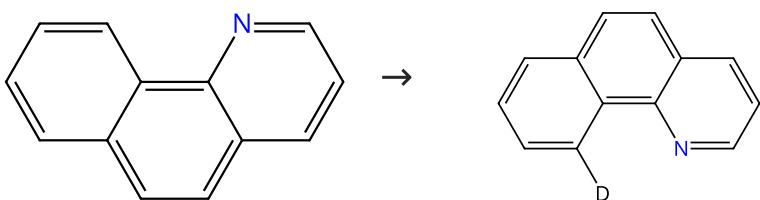
A C-H Activation-Based Strategy for N-Amino Azaheterocycle Synthesis

By: Shi, Pengfei; et al

Organic Letters (2017), 19(16), 4359-4362.

Scheme 183 (1 Reaction)

Steps: 1 Yield: 39%



Suppliers (81)

31-116-CAS-20248325

Steps: 1 Yield: 39%

1.1 Reagents: Methanol-*d*₄, Sodium *tert*-butoxide, 1*H*-Imidazolium, 1,3-bis(2,4,6-trimethylphenyl)-, chloride (1:1)
Catalysts: Dirhodium tetraacetate; 18 h, 55 °C

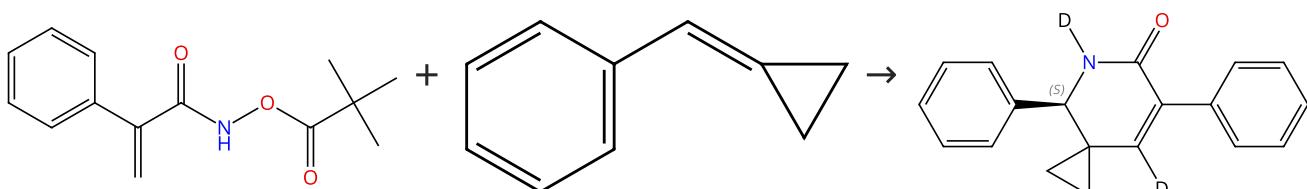
Palladium-Catalyzed Trifluoroethylation of Benzo[*h*]quinoline Derivatives by Mesityl(2,2,2-trifluoroethyl)iodonium Triflate

By: Han, Qiu-Yan; et al

Asian Journal of Organic Chemistry (2019), 8(5), 665-670.

Scheme 184 (1 Reaction)

Steps: 1 Yield: 36%



Supplier (1)

Suppliers (20)

Absolute stereochemistry shown

31-614-CAS-39111547

Steps: 1 Yield: 36%

1.1 Reagents: Sodium acetate
Catalysts: Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13b*R*)-3,7-dihydro-4,5,6-trimethyl-3*aH*-cyclopenta[6,7]cycloocta[2,1-*a*:3,4-*a'*]dinaphthalen-3-*a*-yl]dirhodium
Solvents: Methanol-*d*₄; 6 h, 25 °C

The synthesis of spirocyclopropane skeletons enabled by Rh(II)-catalyzed enantioselective C-H activation/[4 + 2] annulation

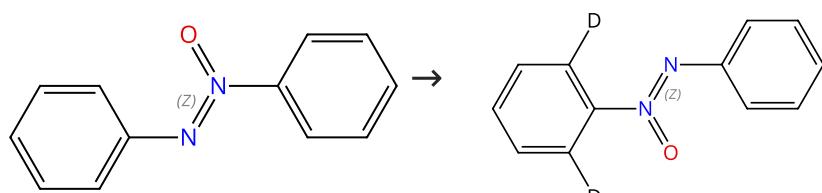
By: Wang, Hao; et al

Chem Catalysis (2023), 3(12), 100822.

Experimental Protocols

Scheme 185 (1 Reaction)

Steps: 1 Yield: 35%



Double bond geometry shown

Double bond geometry shown

Suppliers (10)

31-116-CAS-17140514

Steps: 1 Yield: 35%

1.1 Reagents: Methanol-*d*₄, Iodobenzene diacetate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 8 h, 80 °C

A Highly Selective Amidation of Azoxybenzenes with Sulfonamides via Rhodium(III)-Catalyzed C-H Activation

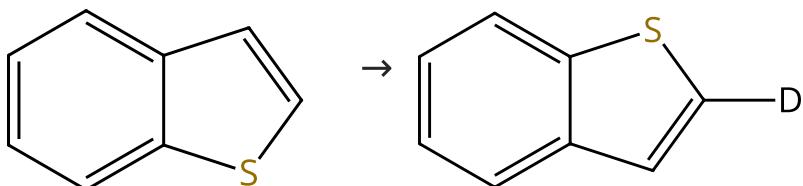
By: Li, Hongji; et al

Synthesis (2017), 49(12), 2711-2720.

Experimental Protocols

Scheme 186 (2 Reactions)

Steps: 1 Yield: 4-35%



Suppliers (99)

Supplier (1)

31-116-CAS-17782803

Steps: 1 Yield: 35%

- 1.1 **Reagents:** Methanol-*d*₄, Silver oxide (Ag₂O)
Catalysts: Acetic acid-*d*, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Tetrahydrofuran, *tert*-Butyl alcohol-*d*, 6 h, 140 °C

Rhodium(III)-Catalyzed Oxidative Cross-Coupling of Unreactive C(sp³)-H Bonds with C(sp²)-H Bonds

By: Tan, Guangying; et al

Organic Letters (2017), 19(18), 4782-4785.

Experimental Protocols

31-116-CAS-6140488

Steps: 1 Yield: 4%

- 1.1 **Reagents:** Methanol-*d*₄, Dipotassium phosphate, Silver oxide (Ag₂O)
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: *tert*-Butanol; 10 min, rt; 1 h, 130 °C

Rhodium(III)-Catalyzed ortho C-H Heteroarylation of (Hetero)aromatic Carboxylic Acids: A Rapid and Concise Access to π-Conjugated Poly-heterocycles

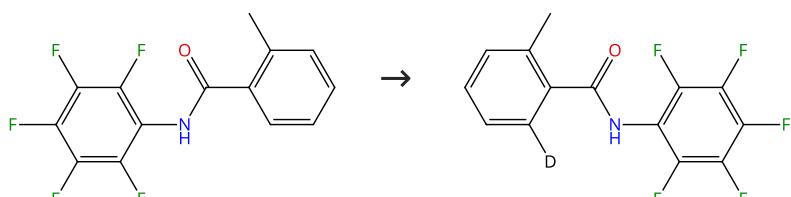
By: Qin, Xurong; et al

Angewandte Chemie, International Edition (2015), 54(24), 7167-7170.

Experimental Protocols

Scheme 187 (1 Reaction)

Steps: 1 Yield: 34%



Suppliers (3)

31-614-CAS-37014911

Steps: 1 Yield: 34%

- 1.1 **Reagents:** Morpholine, Methanol-*d*₄, Potassium hexafluorophosphate, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)
Catalysts: 2-Methylquinoline, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 4 h, 60 °C

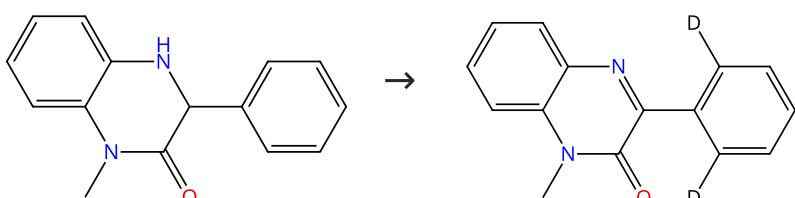
Divergent synthesis of aryl amines and dihydroquinazolinones via electrochemistry-enabled rhodium-catalyzed C-H functionalization

By: Xing, Yi-Kang; et al

Science China: Chemistry (2023), 66(10), 2863-2870.

Scheme 188 (1 Reaction)

Steps: 1 Yield: 34%



Suppliers (3)

31-116-CAS-22752772

Steps: 1 Yield: 34%

1.1 Reagents: Pivalic acid, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

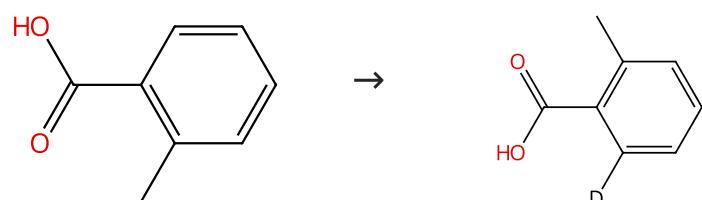
Solvents: Acetonitrile; 24 h, 100 °C

Experimental Protocols

Rh(III)-catalyzed spiroannulation of 3-arylquinoxalin-2(1H)-ones with alkynes: practical access to spiroquino xalinones

By: Zhang, Yuanfei; et al

RSC Advances (2020), 10(37), 22216-22221.



Suppliers (92)

Suppliers (3)

31-116-CAS-20454663

Steps: 1 Yield: 33%

Rhodium-catalyzed ortho-Arylation of (Hetero)aromatic Acids

1.1 Reagents: Potassium carbonate

Catalysts: Dirhodium tetraacetate

Solvents: Methanol-*d*; 0.5 h, 140 °C

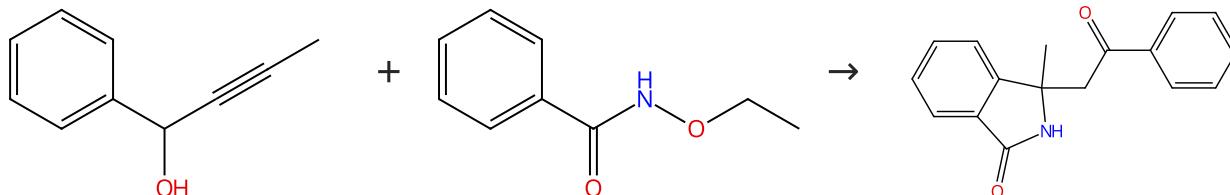
Experimental Protocols

By: Weber, Philip; et al

Advanced Synthesis & Catalysis (2019), 361(17), 3925-3929.

Scheme 190 (1 Reaction)

Steps: 1 Yield: 33%



Suppliers (11)

Suppliers (22)

31-614-CAS-25468102

Steps: 1 Yield: 33%

Propargyl Alcohols as One-Carbon Synthons: Redox-Neutral Rhodium(III)-Catalyzed C-H Bond Activation for the Synthesis of Isoindolinones Bearing a Quaternary Carbon

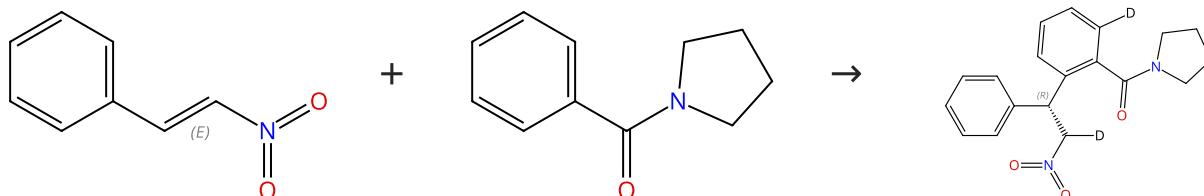
By: Wu, Xiaowei; et al

Organic Letters (2017), 19(6), 1294-1297.

Experimental Protocols

Scheme 191 (1 Reaction)

Steps: 1 Yield: 33%



Double bond geometry shown

Suppliers (43)

Absolute stereochemistry shown

Suppliers (97)

31-614-CAS-36929567

Steps: 1 Yield: 33%

1.1 Reagents: Sodium acetate, Methanol-*d*₄, Silver hexafluoro antimonate

Catalysts: Rhodium, di- μ -iododiodobis[(11a,12,13,14,14a- η)-4,5,6,7,11-pentahydro-1,10-dimethoxy-2,4,4,7,7,9-hexamethyl cyclopent[5,6]inden[7',1':8,9,1]cyclonon[1,2,3-*c*]inden-11a-yl]di-, stereoisomer

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

Experimental Protocols

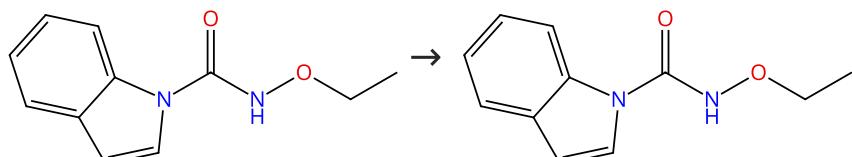
Synthesis of Hexamethyl-1,1'-spirobiindane-Based Chiral Spiro Cp Ligands and Their Application in Rhodium-Catalyzed Enantioselective Aryl C-H Addition to Nitroalkenes

By: Yang, Hui; et al

ACS Catalysis (2023), 13(13), 8838-8844.

Scheme 192 (2 Reactions)

Steps: 1 Yield: 32%


🛒 Supplier (1)

31-614-CAS-29178844

Steps: 1 Yield: 32%

1.1 Reagents: Methanol-*d*₄, Cesium acetate

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)] rhodium]

Solvents: Dichloromethane; 4 h, 40 °C

Experimental Protocols

Rh(III)-Catalyzed [3+2] Annulation and C-H Alkenylation of Indoles with 1,3-Diynes by C-H Activation

By: Kumar, Sanjeev; et al

European Journal of Organic Chemistry (2021), 2021(15), 2223-2229.

31-614-CAS-27583322

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)] rhodium]

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

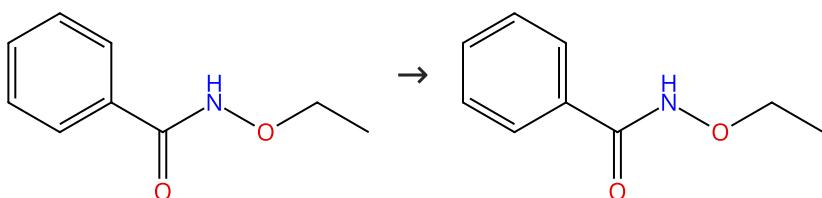
Rhodium(III)-catalyzed C-H allylation of indoles with allyl alcohols via β -hydroxide elimination

By: Wu, Xiaowei; et al

Organic & Biomolecular Chemistry (2018), 16(31), 5691-5698.

Scheme 193 (1 Reaction)

Steps: 1 Yield: 30%


🛒 Suppliers (22)

🛒 Suppliers (3)

31-614-CAS-29727772

Steps: 1 Yield: 30%

1.1 Reagents: Methanol-*d*₄, Cesium acetate

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)] rhodium]

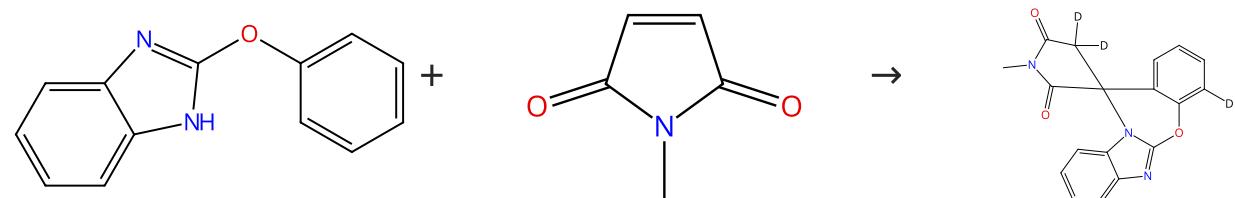
Solvents: 1,2-Dichloroethane; 12 h, 80 °C

Experimental Protocols

Propargyl Alcohols as One-Carbon Synthons: Redox-Neutral Rhodium(III)-Catalyzed C-H Bond Activation for the Synthesis of Isoindolinones Bearing a Quaternary Carbon

By: Wu, Xiaowei; et al

Organic Letters (2017), 19(6), 1294-1297.

Scheme 194 (1 Reaction)

Suppliers (5)

Suppliers (82)

Steps: 1 Yield: 28%

31-614-CAS-39429530

Steps: 1 Yield: 28%

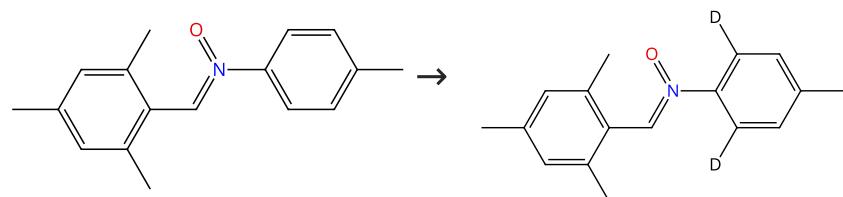
- 1.1 Reagents:** Sodium acetate, Methanol-*d*, Manganese (III) acetate dihydrate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethanol; 12 h, 80 °C

Rh(III)-catalyzed [5+1] spirocyclization to produce novel benzimidazole-incorporated spirosuccinimides

By: Pu, Wei-Yi; et al

Green Synthesis and Catalysis (2023), 4(4), 338-341.

Experimental Protocols

Scheme 195 (1 Reaction)

Steps: 1 Yield: 27%

31-116-CAS-6953210

Steps: 1 Yield: 27%

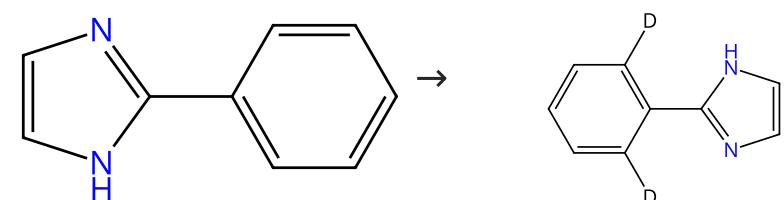
- 1.1 Reagents:** Acetic acid-*d*₄
Catalysts: Tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium(2+)
Solvents: Methanol-*d*₄; 2 h, 80 °C

Rhodium(III)-Catalyzed Redox-Neutral C-H Annulation of Arylnitrones and Alkynes for the Synthesis of Indole Derivatives

By: Zhou, Zhi; et al

Advanced Synthesis & Catalysis (2015), 357(13), 2944-2950.

Experimental Protocols

Scheme 196 (1 Reaction)

Steps: 1 Yield: 26%

Suppliers (94)

31-116-CAS-20686665

Steps: 1 Yield: 26%

- 1.1 Reagents:** Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Dichloromethane; 2 h, 100 °C

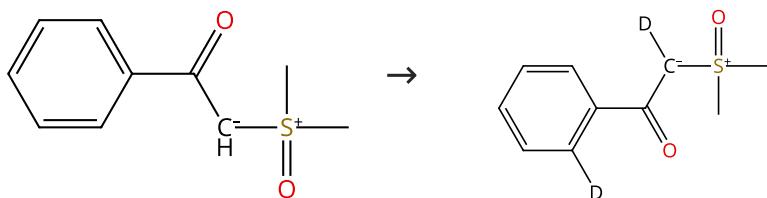
Synthesis of benzoazepine derivatives via Rh(III)-catalyzed inert C(sp²)-H functionalization and [4 + 3] annulation

By: Xu, Yuanshuang; et al

Organic & Biomolecular Chemistry (2019), 17(38), 8706-8710.

Scheme 197 (1 Reaction)

Steps: 1 Yield: 24%



Suppliers (38)

31-614-CAS-42980968

Steps: 1 Yield: 24%

1.1 Reagents: Sodium carbonate, Methanol-*d*₄, Monopotassium phosphate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[trifluoromethyl]sulfonyl-κ*O*]methanesulfonamido-κ*O*silver
Solvents: 1,2-Dichloroethane; 60 min, 70 °C; 70 °C → rt

1.2 Reagents: Sodium chloride
Solvents: Water

Experimental Protocols

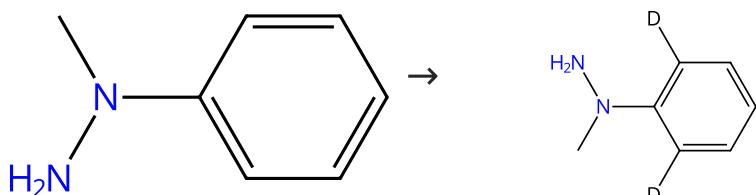
Rhodium-catalyzed C-H α-fluoroalkenylation/annulation of β-ketosulfoxonium ylides with 2,2-difluorovinyl tosylate/oxadiazolones

By: Song, Jia-Lin; et al

Chemical Communications (Cambridge, United Kingdom) (2024), 60(100), 15000-15003.

Scheme 198 (1 Reaction)

Steps: 1 Yield: 23%



Suppliers (73)

31-614-CAS-38559586

Steps: 1 Yield: 23%

1.1 Reagents: Methanol-*d*₄, Zinc triflate
Catalysts: Chloro[2-(1-methylhydrazinyl-κ*N*²)phenyl-κ*C*][(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium
Solvents: 1,2-Dichloroethane; 2 h, rt

Experimental Protocols

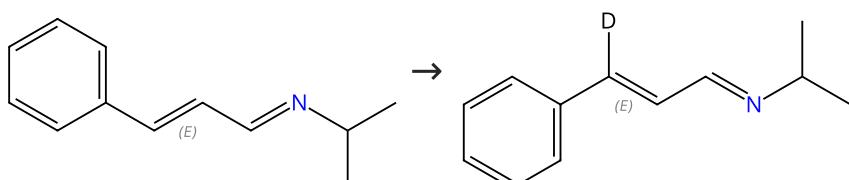
Rh(III)-Catalyzed N-Amino-Directed C-H Coupling with 3-Methyleneoxetan-2-ones for 1,2-Dihydroquinoline-3-carboxylic Acid Synthesis

By: Zhou, Renpeng; et al

Organic Letters (2023), 25(48), 8688-8692.

Scheme 199 (1 Reaction)

Steps: 1 Yield: 22%



E/Z labels describe double bond geometry

E/Z labels describe double bond geometry

Suppliers (2)

31-116-CAS-7206298

Steps: 1 Yield: 22%

1.1 Reagents: Sodium acetate

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Propanoic acid-*d*, 2,2-dimethyl-Solvents: Methanol-*d*; 14 d, rt

Experimental Protocols

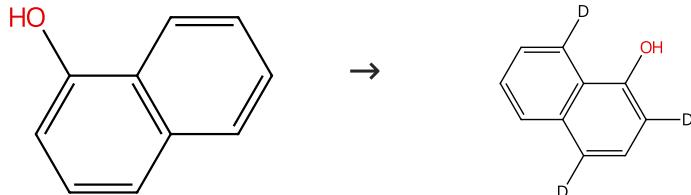
Metal control of selectivity in acetate-assisted C-H bond activation: an experimental and computational study of heterocyclic, vinylic and phenylic C(sp²)-H bonds at Ir and Rh

By: Carr, Kevin J. T.; et al

Chemical Science (2014), 5(6), 2340-2346.

Scheme 200 (1 Reaction)

Steps: 1 Yield: 18%



Suppliers (133)

31-116-CAS-23164823

Steps: 1 Yield: 18%

1.1 Reagents: Methanol-*d*₄, Cesium acetateCatalysts: Bis(acetato- κO)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium; 24 h, 80 °C

Experimental Protocols

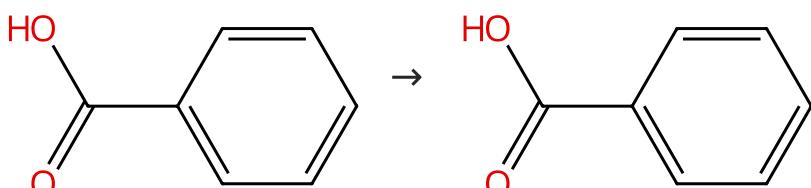
Synthesis of Difluorinated Dihydrobenzo[de]chromenes via Rh(III)-Catalysed C-H Couplings of 1-Naphthols with Gem-Difluoromethylene Alkynes

By: Li, Liping; et al

Advanced Synthesis & Catalysis (2021), 363(5), 1352-1357.

Scheme 201 (1 Reaction)

Steps: 1 Yield: 16%



Suppliers (193)

31-614-CAS-42086934

Steps: 1 Yield: 16%

1.1 Reagents: Sodium acetate, Methanol-*d*Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 2 h, 80 °C

Experimental Protocols

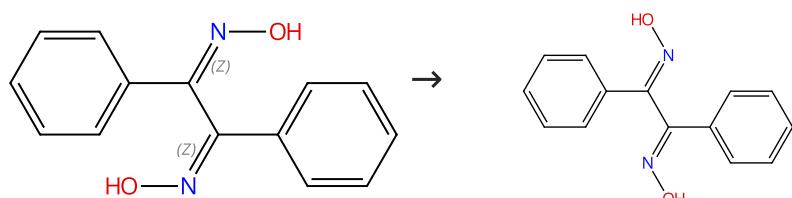
Electrochemistry-enabled Rh-catalyzed regioselective [4 + 1] and [4 + 2] cycloaddition of benzoic acid with alkynyl esters/amides

By: Chiu, Wei-Jung; et al

Green Chemistry (2024), 26(21), 10996-11002.

Scheme 202 (1 Reaction)

Steps: 1 Yield: 15%



Double bond geometry shown

Suppliers (10)

31-614-CAS-26511952

Steps: 1 Yield: 15%

1.1 Reagents: Sodium acetate

Catalysts: *p*-Toluenesulfonic acid, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*₄; 0.5 h, 110 °C

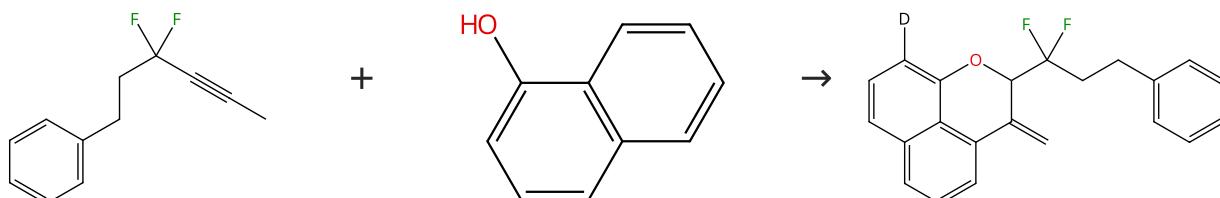
Experimental Protocols

The C-H Activation/Bidirecting Group Strategy for Selective Direct Synthesis of Diverse 1,1'-Biisoquinolines

By: Li, Shiqing; et al

Organic Letters (2020), 22(11), 4207-4212.

Scheme 203 (1 Reaction)



Suppliers (133)

31-116-CAS-23168212

Steps: 1 Yield: 10%

1.1 Reagents: Methanol-*d*₄, Cesium acetateCatalysts: Bis(acetato- κO)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium; 24 h, 80 °C

Experimental Protocols

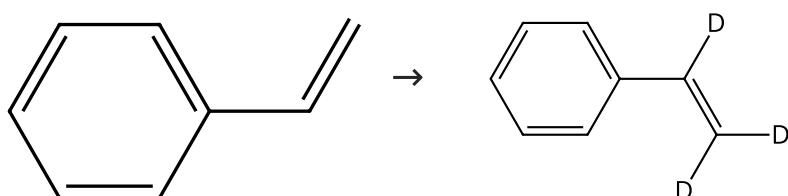
Synthesis of Difluorinated Dihydrobenzo[de]chromenes via Rh(III)-Catalysed C-H Couplings of 1-Naphthols with Gem-Difluoromethylene Alkenes

By: Li, Liping; et al

Advanced Synthesis & Catalysis (2021), 363(5), 1352-1357.

Scheme 204 (2 Reactions)

Steps: 1



Suppliers (122)

Suppliers (22)

31-116-CAS-3389576

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: Hydrochloric acid, Water, Di- μ -chlorotetrakis[(1,2- η -cyclooctene]dirhodiumSolvents: Methanol-*d*; rt; rt → 50 °C; 3 h, 50 °C

Experimental Protocols

Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

31-116-CAS-667032

Steps: 1

1.1 Catalysts: Rhodium(1+), [2-[bis(1,1-dimethylethyl)phosphino- κP]methyl]phenyl- κC]hydrotris(2-propanone)-, (OC-6-24)-, tetrafluoroborate(1-)Solvents: Methanol-*d*; 24 h, 60 °C

Experimental Protocols

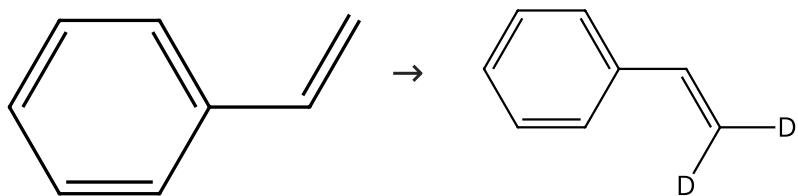
Aromatic vs. Aliphatic C-H Bond Activation by Rhodium(I) as a Function of Agostic Interactions: Catalytic H/D Exchange between Olefins and Methanol or Water

By: Rybtchinski, Boris; et al

Journal of the American Chemical Society (2003), 125(36), 11041-11050.

Scheme 205 (2 Reactions)

Steps: 1



Suppliers (122)

Suppliers (20)

31-116-CAS-989116

Steps: 1

1.1 Reagents: Methanol-d

Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2H-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ^N , κ^O)rhodium

Solvents: Methanol-d; 3 h, rt

Experimental Protocols

Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

31-116-CAS-14646130

Steps: 1

1.1 Reagents: Methanol-d

Catalysts: (*OC*-6-26)-(Acetonitrile)[1,3-bis[2,6-bis(1-methyl ethyl)phenyl]-1,3-dihydro-2H-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ^N , κ^O)rhodium

Solvents: Methanol-d

Experimental Protocols

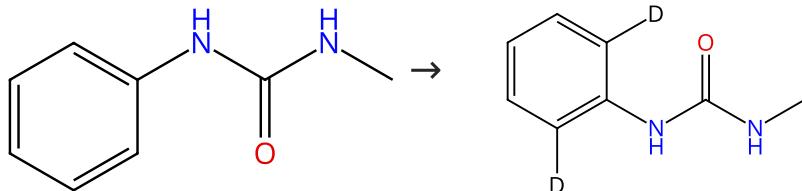
Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 206 (1 Reaction)

Steps: 1



Suppliers (40)

31-116-CAS-23863993

Steps: 1

1.1 Reagents: Zinc acetate, Silver hexafluoroantimonate, 2,2,2-Trifluoroethan-1,1-d₂-ol-dCatalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 24 h, 100 °C

Experimental Protocols

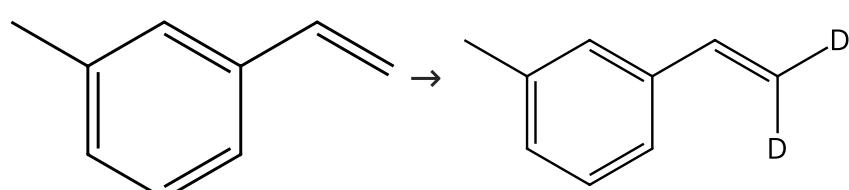
Rh(III)-Catalyzed Chemoselective C-H Alkenylation and [5 + 1] Annulation with Gem-Difluoromethylene Enabled by the Distinctive Fluorine Effect

By: Yang, Jian; et al

Journal of Organic Chemistry (2021), 86(14), 9711-9722.

Scheme 207 (1 Reaction)

Steps: 1



Suppliers (66)

31-116-CAS-9780348

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato-κ*N*¹,κ*O*⁸)rhodiumSolvents: Methanol-*d*; 0.4 h, 25 °C

Experimental Protocols

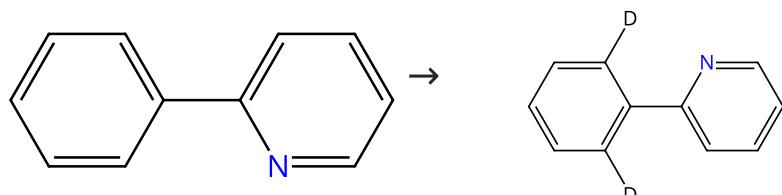
Mild and Selective H/D Exchange at the β Position of Aromatic α-Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 208 (1 Reaction)

Steps: 1



Suppliers (94)

Supplier (1)

31-614-CAS-43626879

Steps: 1

1.1 Reagents: Acetic acid, Cupric acetate, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Acetonitrile; 0.5 h, 120 °C

Experimental Protocols

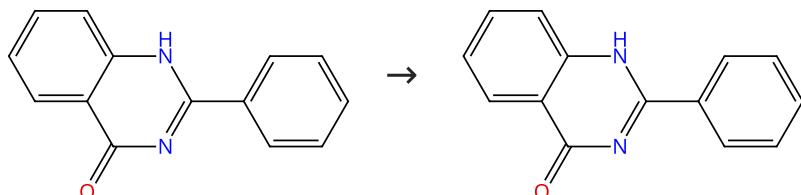
Condition-Controlled Rh(III)-Catalyzed Chemodivergent Cyclization of 2-Arylpyridines with CF₃-Imidoyl Sulfoxonium Ylides via Triple C-H Activation

By: Gao, Xiaoyang; et al

Organic Letters (2025), 27(2), 657-662.

Scheme 209 (1 Reaction)

Steps: 1



Suppliers (72)

31-614-CAS-24226242

Steps: 1

1.1 Reagents: Methanol-*d*₄, Silver hexafluoroantimonateCatalysts: Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium

Solvents: Dichloromethane; 24 h, 100 °C

Experimental Protocols

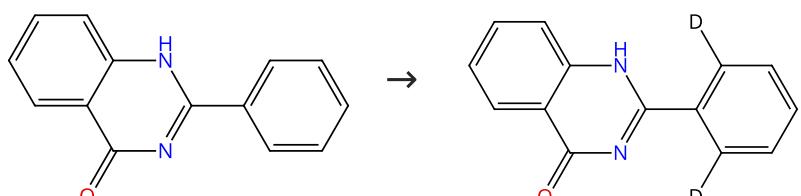
One-Pot Construction of Diverse Products using Versatile Cyclopropenones

By: Huang, Tianle; et al

Advanced Synthesis & Catalysis (2021), 363(21), 4899-4904.

Scheme 210 (1 Reaction)

Steps: 1



Suppliers (72)

31-614-CAS-36757658

Steps: 1

Rh(III)-catalyzed highly regioselective construction of spiro-isoindoline frameworks through ortho-C-H activation

By: Srinivas, L.; et al

Journal of Molecular Structure (2023), 1289, 135813.

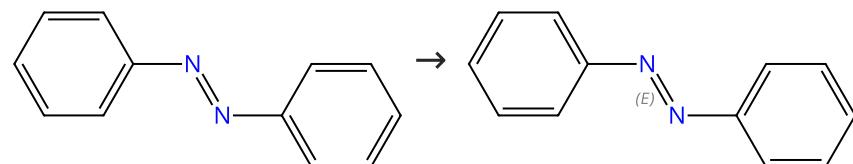
1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; rt; 12 h, 100 °C

Experimental Protocols

Scheme 211 (1 Reaction)

Steps: 1



Suppliers (76)

Double bond geometry shown

31-614-CAS-31800694

Steps: 1

Rh(III)-Catalyzed Synthesis of Indazolo[2,3-*a*]quinolines: Vinylene Carbonate as C1 and C2 Building Blocks

By: Hu, Wei; et al

Organic Letters (2022), 24(14), 2613-2618.

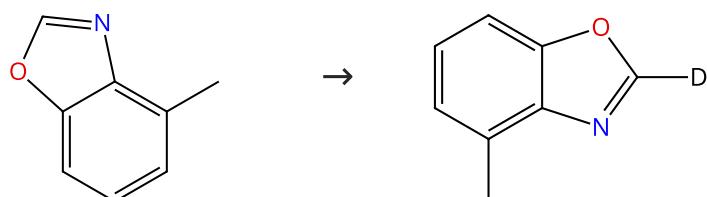
1.1 Reagents: Methanol-*d*₄, Silver triflate, Phosphoric acidCatalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Tetrahydrofuran; 110 °C

Experimental Protocols

Scheme 212 (1 Reaction)

Steps: 1



Suppliers (38)

31-116-CAS-4666445

Steps: 1

Rh(I)-Bisphosphine-Catalyzed Asymmetric, Intermolecular Hydroheterarylation of α-Substituted Acrylate Derivatives

By: Filloux, Claire M.; et al

Journal of the American Chemical Society (2015), 137(1), 508-517.

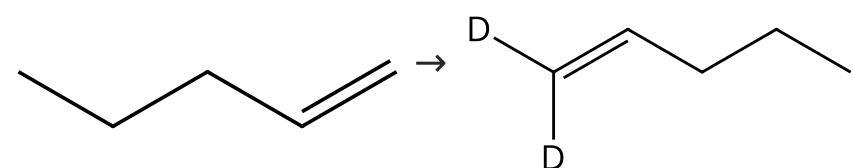
1.1 Catalysts: 1,2-Bis(diphenylphosphino)ethane, Bis[μ-(acetato-κO:κO')]bis[(1,2,5,6-η)-1,5-cyclooctadiene]dirhodium

Solvents: Toluene, Methanol-*d*; 24 h, rt → 120 °C

Experimental Protocols

Scheme 213 (1 Reaction)

Steps: 1



Suppliers (49)

Suppliers (3)

31-116-CAS-14326211

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato-κ*N*¹,κ*O*⁸)rhodiumSolvents: Methanol-*d*; 2 h, 50 °C

Experimental Protocols

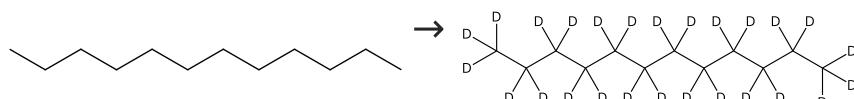
Mild and Selective H/D Exchange at the β Position of Aromatic α-Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 214 (1 Reaction)

Steps: 1



Suppliers (114)

Suppliers (40)

31-116-CAS-15237085

Steps: 1

1.1 Reagents: Water-*d*₂

Catalysts: Platinum, Rhodium

Solvents: 2-Propan-1,1,1,2,3,3,3-*d*₇-ol-*d*; 24 h, 120 °C

Experimental Protocols

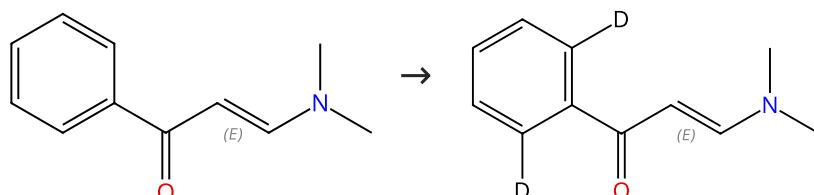
Multiple deuteration of alkanes synergistically-catalyzed by platinum and rhodium on carbon as a mixed catalytic system

By: Yamada, Tsuyoshi; et al

RSC Advances (2015), 5(18), 13727-13732.

Scheme 215 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

Suppliers (49)

31-614-CAS-41279398

Steps: 1

1.1 Reagents: Methanol-*d*₄, 1-Adamantanecarboxylic acidCatalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Ethyl acetate; 1 h, 80 °C

Experimental Protocols

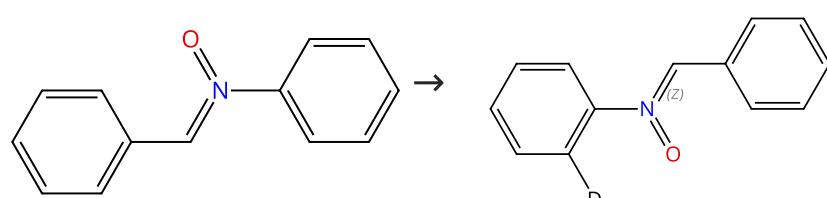
Divergent Synthesis of Naphthalenone Spiroindanediones or 4-Acyl-1-naphthols from Aryl Enaminones Featuring Reuse of Dimethylamine

By: Yang, Chun; et al

Advanced Synthesis & Catalysis (2024), 366(15), 3372-3378.

Scheme 216 (1 Reaction)

Steps: 1



Suppliers (25)

Double bond geometry shown

31-116-CAS-21884079

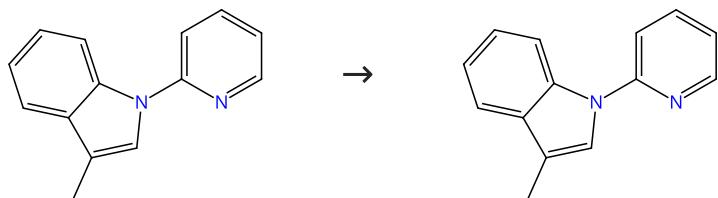
Steps: 1

- 1.1 **Reagents:** Pivalic acid, Sodium acetate, Oxygen, Silver fluoride (AgF_2), 2,2,2-Trifluoroethanol- d
Catalysts: Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13bR)-3,7-dihydro-2,8-dimethoxy-3aH-cyclopenta[6,7]cycloocta[2,1- a :3,4- a']dinaphthalen-3a-yl]dirhodium; 24 h, 0 °C

Rhodium(III)-Catalyzed Asymmetric Access to Spirocycles through C-H Activation and Axial-to-Central Chirality Transfer
By: Kong, Lingheng; et al
Angewandte Chemie, International Edition (2020), 59(18), 7188-7192.

Scheme 217 (1 Reaction)

Steps: 1



Suppliers (9)

31-614-CAS-32171185

Steps: 1

- 1.1 **Catalysts:** Silver nitrate, Bis(η^2 -ethene)[(8a,9,10,11,11a- η)-(2aS)-1,2,3,4-tetrahydro-7,13-dimethoxy-8H-cyclopenta[5,6]cyclonona[1,2,3- c :1,9,8- c'] d]diinden-8a(12H-yl)rhodium
Solvents: 1,2-Dichloroethane; 30 min, 25 °C
1.2 **Reagents:** Methanol- d_4 ; 12 h, 25 °C

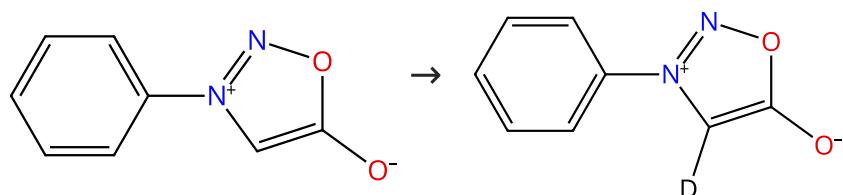
SCpRh(III)-Catalyzed Enantioselective Synthesis of Atropisomers by C2-Arylation of Indoles with 1-Diazonaphthoquinones

By: Yin, Si-Yong; et al
Organic Letters (2022), 24(20), 3620-3625.

Experimental Protocols

Scheme 218 (1 Reaction)

Steps: 1



Suppliers (48)

31-116-CAS-16389176

Steps: 1

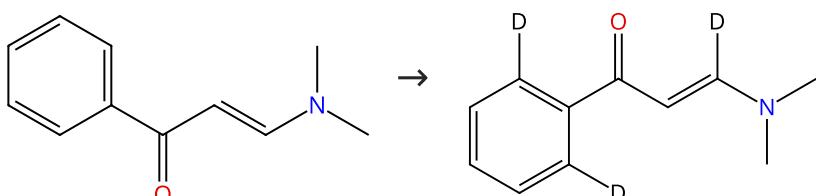
- 1.1 **Reagents:** Cupric acetate, Methanol- d_4
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Acetonitrile; 18 h, 80 °C

Rhodium-Catalyzed Oxidative Synthesis of Quinoline-Fused Sydrones via 2-fold C-H Bond Activation

By: Li, Lei; et al
Journal of Organic Chemistry (2016), 81(23), 12038-12045.

Scheme 219 (1 Reaction)

Steps: 1



Suppliers (68)

31-614-CAS-37013123

Steps: 1

1.1 Reagents: Silver acetate, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 12 h, 40 °C

Experimental Protocols

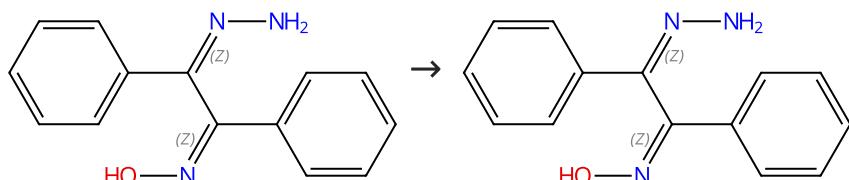
Rh(III)-catalyzed cascade annulation reaction of N,N-dimethyl enaminones with iodonium ylides to give substituted isocoumarins

By: Zhang, Mingshuai; et al

New Journal of Chemistry (2023), 47(26), 12274-12278.

Scheme 220 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

31-614-CAS-36272572

Steps: 1

1.1 Reagents: Acetic acid, Silver acetate, Methanol-*d*₄, [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl]-κ*O*]methanesulfonamide-κ*O*silverCatalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 0.5 h, 90 °C

Experimental Protocols

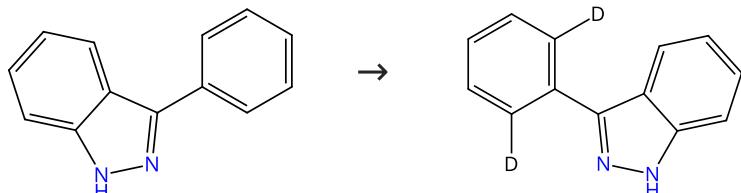
Hydrazone-oxime Selectively Directed Redox-Neutral [4 + 2] Annulations Cascade with Alkynes and Iodonium Ylides to Build 1,1'-Biisoquinoline Mono-N-oxides

By: Wen, Chaoying; et al

Organic Letters (2023), 25(15), 2616-2621.

Scheme 221 (1 Reaction)

Steps: 1



Suppliers (59)

31-614-CAS-34501158

Steps: 1

1.1 Reagents: Acetic acid, Methanol-*d*Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 1 h, 38 °C

Experimental Protocols

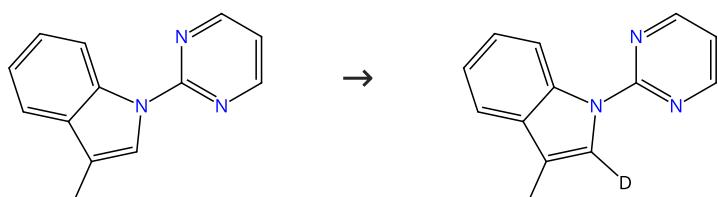
Synthesis of dihydroindazolo[2,3-f]phenanthridin-5(6H)-ones via Rh(III)-catalyzed C-H activation of 2-aryl indazoles and annulation with iodonium ylides

By: Liang, Jiazh; et al

Green Chemistry (2022), 24(21), 8441-8446.

Scheme 222 (2 Reactions)

Steps: 1



Suppliers (5)

31-116-CAS-18850046	Steps: 1	Synthesis of Terminal Vinyl Indoles via Rh ^{III} -Catalyzed Direct C-H Alkenylation with Potassium Vinyltrifluoroborate By: Zhou, Chun-Ni; et al Chemistry - A European Journal (2018), 24(21), 5469-5473.
1.1 Reagents: Silver acetate, Methanol- <i>d</i> ₄ , Oxygen Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; 3 h, 40 °C Experimental Protocols	Steps: 1	Synthesis of Terminal Vinyl Indoles via Rh ^{III} -Catalyzed Direct C-H Alkenylation with Potassium Vinyltrifluoroborate By: Zhou, Chun-Ni; et al Chemistry - A European Journal (2018), 24(21), 5469-5473.

Scheme 223 (1 Reaction)	Steps: 1
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> Suppliers (73) Suppliers (13) </div>	

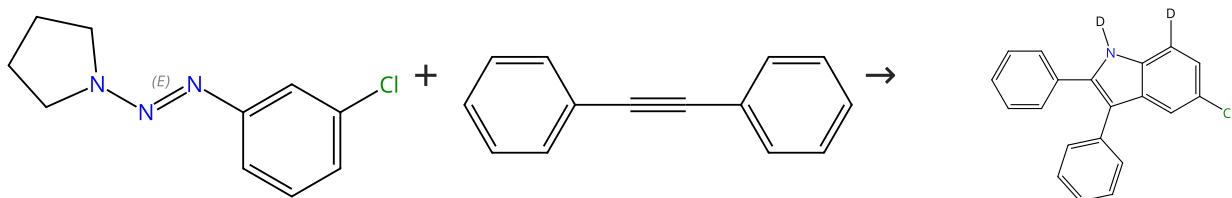
31-116-CAS-22359815	Steps: 1	Rh ^{III} -Catalyzed Double Dehydrogenative Coupling of Free 1-Naphthylamines with α,β-Uncaturated Esters By: Rej, Supriya; et al Chemistry - A European Journal (2020), 26(49), 11093-11098.
1.1 Reagents: Ethanol- <i>d</i> ₆ Catalysts: Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium Solvents: <i>o</i> -Xylene; 4 h, 80 °C Experimental Protocols	Steps: 1	

Scheme 224 (1 Reaction)	Steps: 1
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> Suppliers (10) </div>	

31-614-CAS-34877721	Steps: 1	Experimental and computational studies on rhodium-catalyzed C4(5) _{aryl} -H activation/annulation of imidazoles with alkynes: facile synthesis of six types of N-heterocycles By: Tian, Ya-Nan; et al Organic Chemistry Frontiers (2023), 10(1), 83-91.
1.1 Reagents: Methanol- <i>d</i> ₄ , Copper(II) triflate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium] Solvents: Methanol; 1 h, 100 °C Experimental Protocols	Steps: 1	

Scheme 225 (1 Reaction)

Steps: 1



Double bond geometry shown

Suppliers (88)

Suppliers (4)

31-116-CAS-6581694

Steps: 1

1.1 Catalysts: Cupric acetate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 3 h, 90 °C

Experimental Protocols

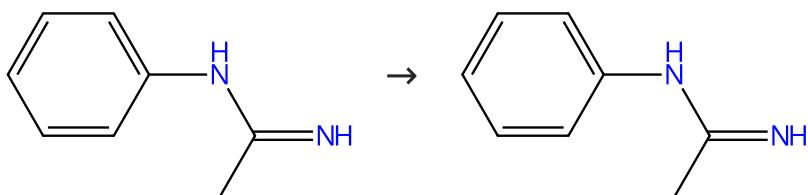
General and Efficient Synthesis of Indoles through Triazene-Directed C-H Annulation

By: Wang, Chengming; et al

Angewandte Chemie, International Edition (2013), 52(22), 5795-5798.

Scheme 226 (1 Reaction)

Steps: 1



Suppliers (12)

31-614-CAS-27462343

Steps: 1

1.1 Reagents: Methanol-*d*₄, Oxygen, Silver hexafluoroantimonate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Dichloromethane; 30 min, 100 °C

Experimental Protocols

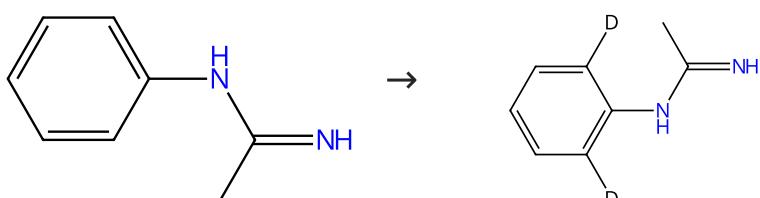
Synthesis of 4-ethenyl quinazolines via rhodium(III)-catalyzed [5 + 1] annulation reaction of N-arylamidines with cyclopropenones

By: Xing, Huimin; et al

Organic Chemistry Frontiers (2020), 7(4), 672-677.

Scheme 227 (1 Reaction)

Steps: 1



Suppliers (12)

31-614-CAS-35899690

Steps: 1

1.1 Reagents: Methanol-*d*₄, Silver fluoride, Potassium ferricyanide
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol; 30 min, 120 °C

Experimental Protocols

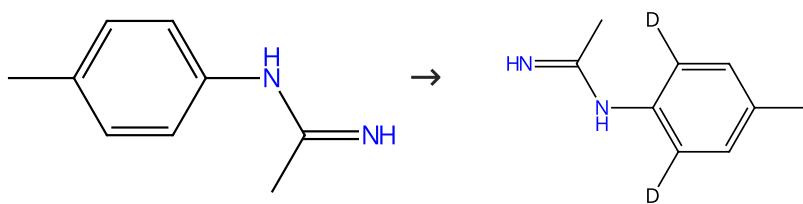
Rhodium(III)-Catalyzed Divergent C-H Functionalization of N-Aryl Amides with Iodonium Ylides: Access to Carbazolones and Zwitterionic Salts

By: Ren, Jie; et al

Advanced Synthesis & Catalysis (2023), 365(11), 1817-1823.

Scheme 228 (1 Reaction)

Steps: 1



Suppliers (10)

31-116-CAS-21455701

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1-Butyl-3-methylimidazolium tetrafluoroborate; 10 min, 140 °C

Practical Synthesis of Benzimidazo[1,2-*a*]quinolines via Rh(III)-Catalyzed C-H Activation Cascade Reaction from Imidamides and Anthranils

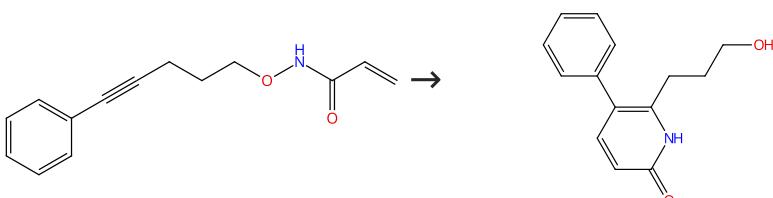
By: Hu, Yao; et al

Organic Letters (2020), 22(2), 501-504.

Experimental Protocols

Scheme 229 (1 Reaction)

Steps: 1



31-614-CAS-25579297

Steps: 1

1.1 Reagents: Cesium acetate

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*₄; 0.3 h, 60 °C; 60 °C → rt

Rhodium(III)-Catalyzed Intramolecular Annulation through C-H Activation: Total Synthesis of (±)-Antofine, (±)-Septicine, (±)-Tylophorine, and Rosettacin

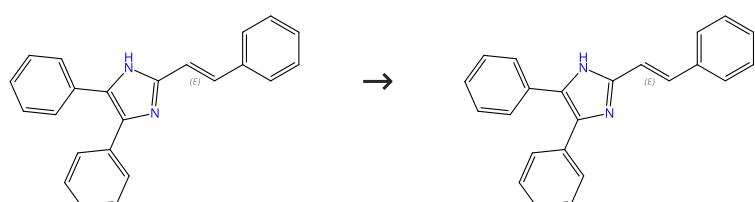
By: Xu, Xianxiu; et al

Angewandte Chemie, International Edition (2012), 51(37), 9372-9376, S9372/1-S9372/170.

Experimental Protocols

Scheme 230 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

Suppliers (2)

31-614-CAS-34877722

Steps: 1

1.1 Reagents: Methanol-*d*₄, Copper(II) triflateCatalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Methanol; 1 h, 100 °C

Experimental and computational studies on rhodium-catalyzed C4(5)aryl-H activation/annulation of imidazoles with alkynes: facile synthesis of six types of N-heterocycles

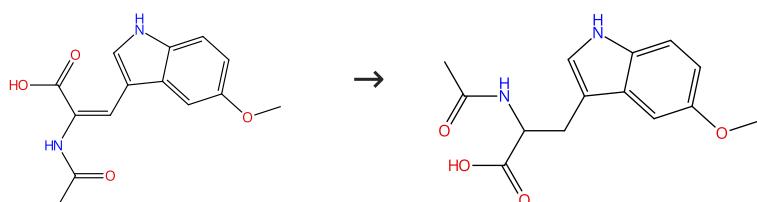
By: Tian, Ya-Nan; et al

Organic Chemistry Frontiers (2023), 10(1), 83-91.

Experimental Protocols

Scheme 231 (1 Reaction)

Steps: 1


🛒 Suppliers (32)

31-244-CAS-7100957

Steps: 1

1.1 Reagents: Hydrogen

Catalysts: Rhodium(1+), bis[(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), 1,1'-[[(4S,5S)-2,2-Dimethyl-1,3-dioxolane-4,5-diy]bis(methylene)]bis[1,1-diphenylphosphine]
Solvents: Methanol-*d*₄; 15 s, rt

Hyperpolarization of amino acid precursors to neurotransmitters with parahydrogen induced polarization

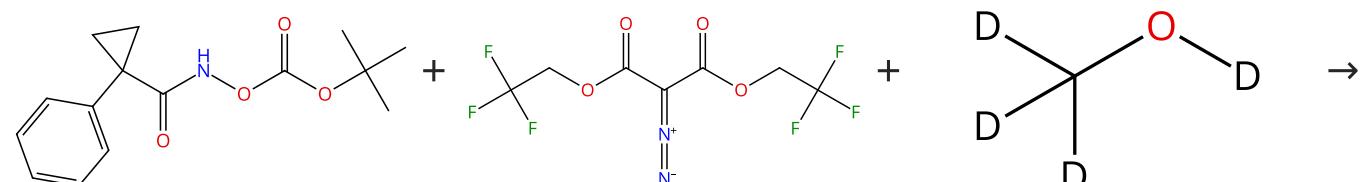
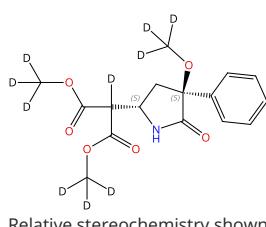
By: Soon, Pei Che; et al

Chemical Communications (Cambridge, United Kingdom) (2013), 49(46), 5304-5306.

Experimental Protocols

Scheme 232 (1 Reaction)

Steps: 1


🛒 Suppliers (2)
🛒 Suppliers (248)


31-136-CAS-22342841

Steps: 1

Rhodium(III)-Catalyzed Cyclopropane C-H/C-C Activation Sequence Provides Diastereoselective Access to α -Alkoxyated γ -Lactams

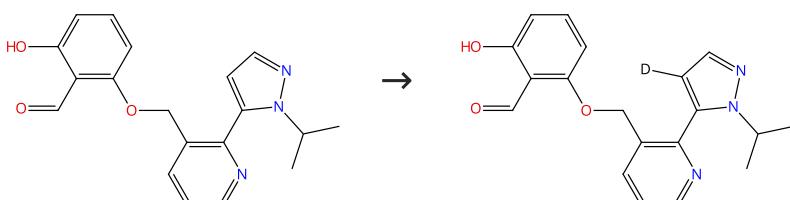
By: Audic, Benoit; et al

Organic Letters (2020), 22(13), 5030-5034.

- 1.1 Reagents: Sodium carbonate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 40 h, 0 °C
- 1.2 Reagents: Hydrochloric acid
Solvents: Methanol; 0 °C

Scheme 233 (1 Reaction)

Steps: 1


🛒 Suppliers (65)

31-614-CAS-34589839

Steps: 1

1.1 Reagents: Acetic acid, Cupric acetate, Methanol-*d*₄
Catalysts: Silver hexafluoroantimonate, Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium
Solvents: 1,2-Dichloroethane; 1 h, 95 °C

Experimental Protocols

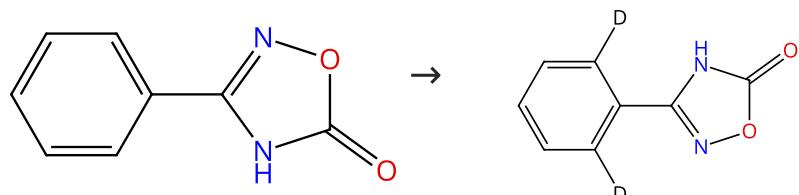
Postmodification of voxelotor (GBT 440) via [Rh]-catalyzed cross dehydrogenative coupling with olefins

By: Kalshetti, Rupali G.; et al

Bioorganic & Medicinal Chemistry Letters (2022), 77, 129022.

Scheme 234 (1 Reaction)

Steps: 1



Suppliers (71)

31-614-CAS-34441155

Steps: 1

1.1 Reagents: Methanol-*d*₄, Silver trifluoroacetate, Zinc sulfate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 2 h, 80 °C

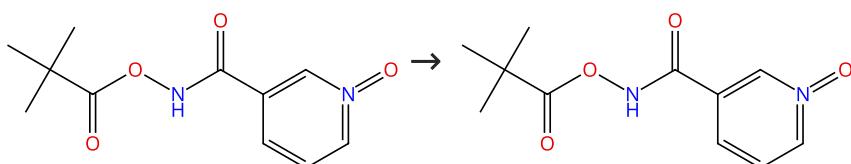
C-H Activation-Engaged Synthesis of Diverse Fused-Heterocycles from the Reactions of 3-Phenyl-1,2,4-oxadiazol-5(2H)-ones with Vinylene Carbonate

By: Wang, Yuerong; et al

Organometallics (2022), 41(17), 2494-2503.

Scheme 235 (1 Reaction)

Steps: 1



31-614-CAS-27577191

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 18 h, 20 °C

Rh(III)-Catalyzed C-H Activation and Double Directing Group Strategy for the Regioselective Synthesis of Naphthyridinones

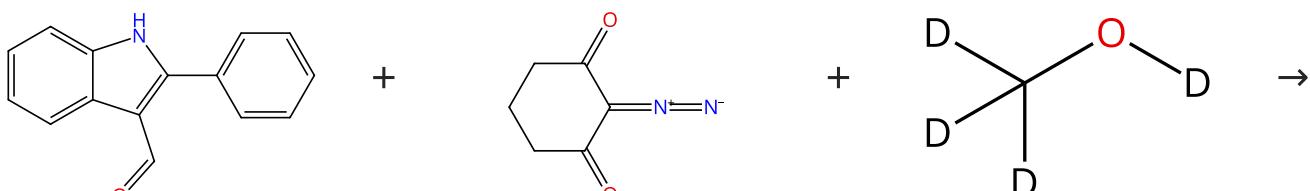
By: Huckins, John R.; et al

Journal of the American Chemical Society (2013), 135(39), 14492-14495.

Experimental Protocols

Scheme 236 (1 Reaction)

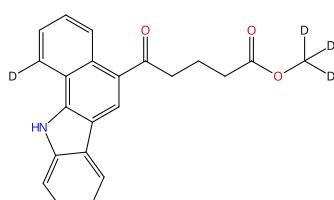
Steps: 1



Suppliers (73)

Suppliers (19)

Suppliers (248)



31-614-CAS-31532891

Steps: 1

1.1 Reagents: 1-Adamantanecarboxylic acid

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 2 h, 100 °C; 100 °C → rt

1.2 Reagents: Water

Experimental Protocols

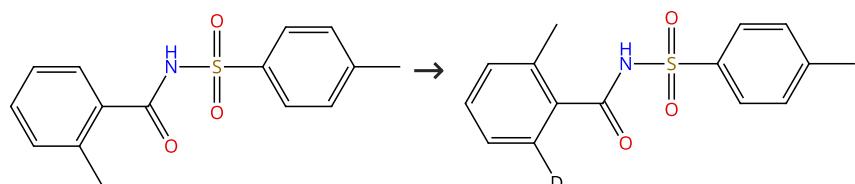
Rh(III)-Catalyzed Reaction of 2-Aryl-3-acyl-1H-indoles with α -Diazo Carbonyl Compounds: Synthesis of 5-Carbonyl Substituted Benzo[a]carbazoles via [5+1] Annulation

By: Li, Bin; et al

Asian Journal of Organic Chemistry (2022), 11(3), e202100710.

Scheme 237 (1 Reaction)

Steps: 1



Suppliers (13)

31-614-CAS-25048526

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Silver acetate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 30 min, 25 °C

Experimental Protocols

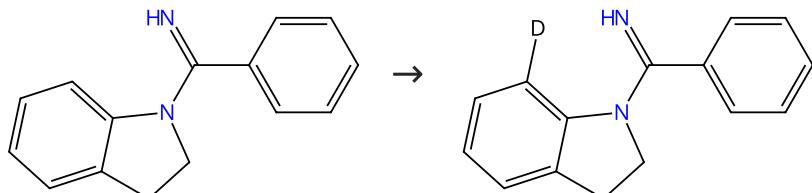
Selective Gram-Scale C-H Carbenoid Functionalization of N-Sulfonylarylamides with a Rhodium Catalyst

By: Dong, Yi; et al

Journal of Organic Chemistry (2021), 86(17), 11660-11672.

Scheme 238 (1 Reaction)

Steps: 1



Suppliers (2)

31-614-CAS-41541535

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]

Solvents: Dichloromethane; 0.5 h, 120 °C

Experimental Protocols

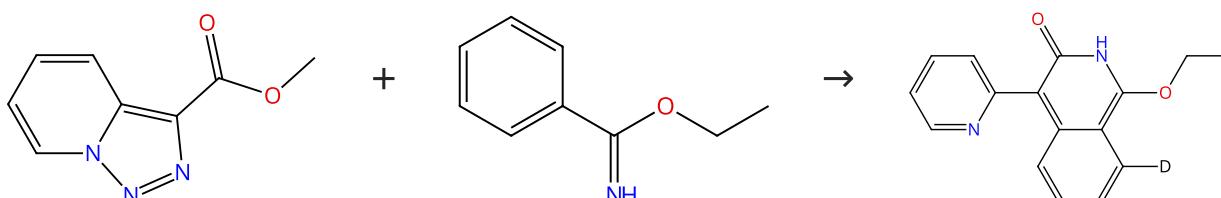
Synthesis of Heptacyclic Compounds through C-H Bond Activation-Initiated Cascade Reactions

By: He, Xing; et al

Organic Letters (2024), 26(35), 7425-7430.

Scheme 239 (1 Reaction)

Steps: 1



Suppliers (20)

Suppliers (20)

31-614-CAS-33725929

Steps: 1

Cp^{*}Rh^{III}-Catalyzed Cascade Annulation of Arylimides with Pyridotriazoles toward Isoquinolin-3-ol Derivatives

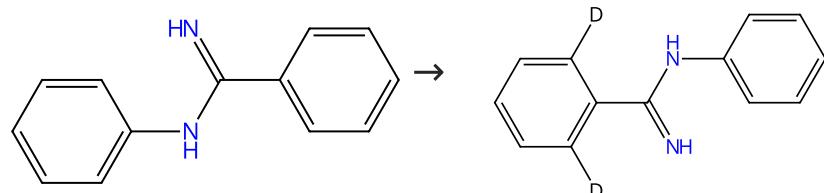
By: Yan, Weidan; et al

Journal of Organic Chemistry (2022), 87(16), 10858-10868.

- 1.1 **Reagents:** Sodium acetate, Methanol-*d*₄, 1-Adamantane carboxylic acid
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl-κ*O*]methanesulfonamido-κ*O*]silver
Solvents: Toluene; 3 h, 120 °C

Scheme 240 (2 Reactions)

Steps: 1



Suppliers (63)

31-116-CAS-23912068

Steps: 1

Rhodium(III)-Catalyzed [4+2] Annulation of N-Arylbenz amidines with Propargyl Alcohols: Highly Regioselective Synthesis of 1-Aminoisoquinolines Controlled by Noncovalent Interaction

By: Ren, Jie; et al

Organic Letters (2021), 23(17), 6628-6632.

Experimental Protocols

31-116-CAS-24350747

Steps: 1

Rhodium(III)-catalyzed [4 + 2] annulation of N- arylbenz amidines with 1,4,2-dioxazol-5-ones: Easy access to 4-aminoquinazolines via highly selective C-H bond activation

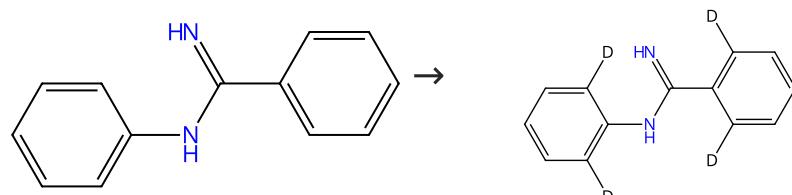
By: Ren, Jie; et al

Chinese Chemical Letters (2021), 32(8), 2592-2596.

Experimental Protocols

Scheme 241 (1 Reaction)

Steps: 1



Suppliers (63)

31-614-CAS-35482987

Steps: 1

Rhodium(iii)-catalyzed oxidative annulation of N-arylbenz amidines with maleimides via dual C-H activation

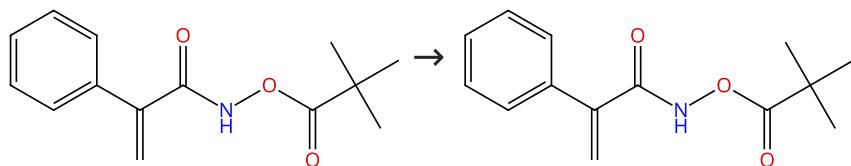
By: Sankaram, G. Siva; et al

Organic & Biomolecular Chemistry (2023), 21(8), 1719-1724.

- 1.1 **Reagents:** Cupric acetate, Methanol-*d*₄, 1-Adamantane carboxylic acid, *N*-Methylmaleimide
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Toluene; 30 min, 120 °C

Scheme 242 (1 Reaction)

Steps: 1


 Supplier (1)

31-614-CAS-36919291

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 6 h, rt

Experimental Protocols

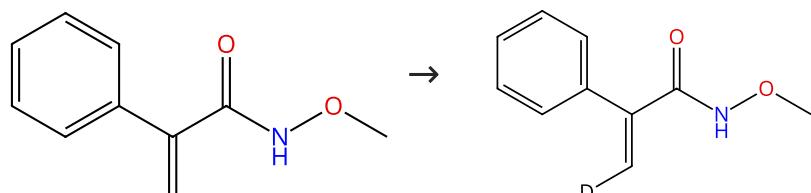
Rhodium-catalyzed regioselective C-H activation/Loschen rearrangement/annulation for the green synthesis of trisubstituted 2-pyridones

By: Li, Yidi; et al

Organic Chemistry Frontiers (2023), 10(12), 3000-3009.

Scheme 243 (1 Reaction)

Steps: 1


 Suppliers (2)

31-614-CAS-40652167

Steps: 1

1.1 Reagents: Zinc acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 12.0 h, 40 °C

Experimental Protocols

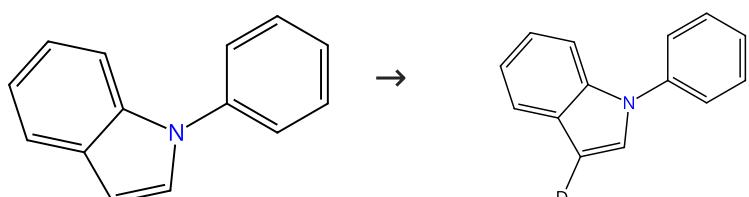
Accessing 7,8-Dihydroquinoline-2,5-diones via Rh-Catalyzed Olefinic C-H Activation/[4+2] Cyclization

By: Liu, Xueqing; et al

Organic Letters (2024), 26(24), 5136-5140.

Scheme 244 (1 Reaction)

Steps: 1


 Suppliers (68)

31-614-CAS-35766122

Steps: 1

1.1 Reagents: Methanol-*d*₄
 Catalysts: Silver trifluoroacetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 6 h, 70 °C

Experimental Protocols

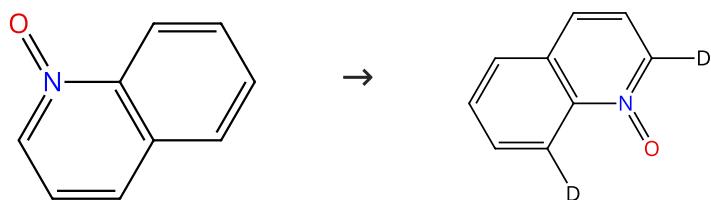
Synthesis of 2-(2-Nitroalkyl)indoles by Rhodium(III)-Catalyzed C-H Alkylation

By: Liu, Shuang-Liang; et al

Organic Letters (2023), 25(9), 1375-1379.

Scheme 245 (1 Reaction)

Steps: 1



Suppliers (57)

Supplier (1)

31-614-CAS-37231267

Steps: 1

1.1 **Reagents:** Pivalic acid, Silver oxide (Ag_2O), 2-Propan-2-*d*-ol-*d*, 1,1,1,3,3,3-hexafluoro-**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 5 h, 100 °C

Experimental Protocols

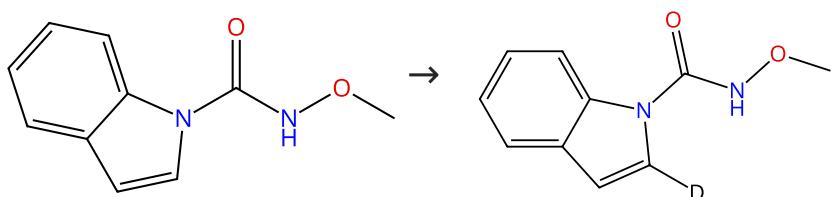
Construction of unsymmetrical heterobiaryls via the $\text{Cp}^*\text{Rh(II)}\text{-catalyzed C-H/C-H coupling of heteroarenes}$

By: Parmar, Diksha; et al

Chemical Communications (Cambridge, United Kingdom) (2023), 59(63), 9646-9649.

Scheme 246 (3 Reactions)

Steps: 1



Supplier (1)

31-116-CAS-23630330

Steps: 1

1.1 **Reagents:** Silver acetate, Methanol-*d*₄**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]**Solvents:** Dichloromethane; 10 min, rt

Experimental Protocols

Rh(III)-Catalyzed Chemodivergent Annulations between Indoles and Iodonium Carbenes: A Rapid Access to Tricyclic and Tetracyclic N-Heterocycles

By: Nunewar, Saiprasad; et al

Organic Letters (2021), 23(11), 4233-4238.

31-614-CAS-24527452

Steps: 1

1.1 **Reagents:** Zinc acetate, Methanol-*d*₄**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]**Solvents:** Dichloromethane; 36 h, 100 °C

Experimental Protocols

Easy synthesis of imidazo[1,5-*a*]indol-3-ones through Rh(III)-catalyzed C-H allenylation/annulation

By: Zhu, Bin; et al

Chemical Communications (Cambridge, United Kingdom) (2021), 57(90), 12012-12015.

31-116-CAS-22314548

Steps: 1

1.1 **Reagents:** Sodium acetate, Methanol-*d*₄**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]**Solvents:** 1,4-Dioxane; 4 h, 25 °C

Experimental Protocols

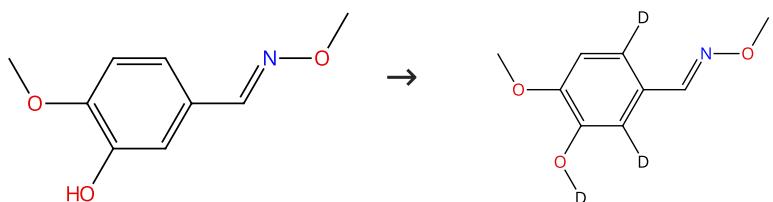
Rhodium-Catalyzed Cascade Reactions of Indoles with 4-Hydroxy-2-Alkynoates for the Synthesis of Indole-Fused Polyheterocycles

By: Wu, Xiaowei; et al

Advanced Synthesis & Catalysis (2020), 362(14), 2953-2960.

Scheme 247 (1 Reaction)

Steps: 1



Supplier (1)

31-116-CAS-13487069

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium]; 24 h, 60 °C

Experimental Protocols

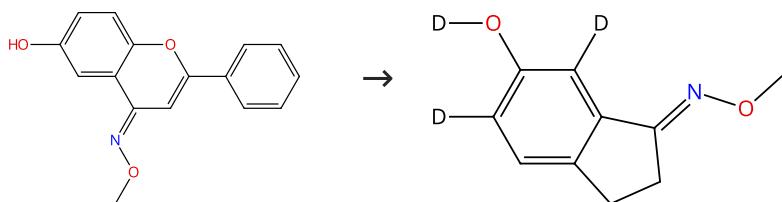
Rh^{III}-catalyzed dual directing group assisted sterically hindered C-H bond activation: a unique route to meta and ortho substituted benzofurans

By: Yeh, Chien-Hung; et al

Organic & Biomolecular Chemistry (2014), 12(45), 9105-9108.

Scheme 248 (1 Reaction)

Steps: 1



31-116-CAS-12887088

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium]; 24 h, 100 °C

Experimental Protocols

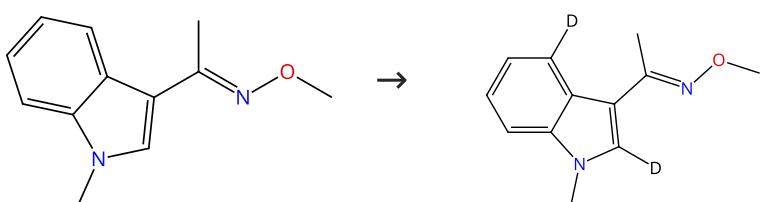
Rh^{III}-catalyzed dual directing group assisted sterically hindered C-H bond activation: a unique route to meta and ortho substituted benzofurans

By: Yeh, Chien-Hung; et al

Organic & Biomolecular Chemistry (2014), 12(45), 9105-9108.

Scheme 249 (1 Reaction)

Steps: 1



31-614-CAS-24349787

Steps: 1

1.1 Reagents: 2,2,2-Trifluoroethan-1,1-*d*₂-ol-*d*
 Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 24 h, 120 °C

Experimental Protocols

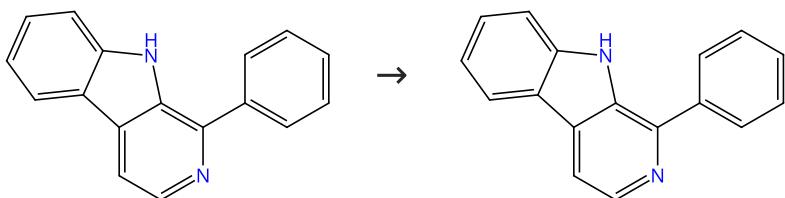
γ-Carboline synthesis enabled by Rh(III)-catalyzed regioselective C-H annulation

By: Jiang, Bo; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(87), 13389-13392.

Scheme 250 (1 Reaction)

Steps: 1



Suppliers (21)

31-614-CAS-34691853

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Silver acetate, Di- μ -chlorobis[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium

Solvents: 1,2-Dichloroethane; 20 min, rt

Rh(III)-catalysed site-selective alkylation of β -carbolines/isoquinolines and tandem C-H/C-N functionalization to construct indolizine-indole frameworks

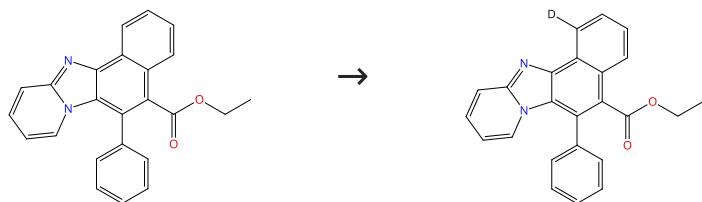
By: Bora, Darshana; et al

Molecular Catalysis (2022), 533, 112783.

Experimental Protocols

Scheme 251 (1 Reaction)

Steps: 1



31-116-CAS-20692765

Steps: 1

1.1 Reagents: Acetic acid, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 2 h, 140 °C

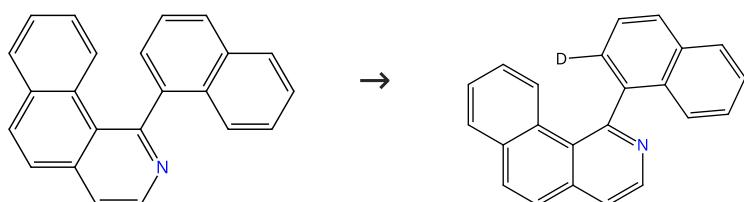
Synthesis of fused imidazo[1,2-a]pyridines derivatives through cascade C(sp²)-H functionalizations

By: Li, Bin; et al

Organic & Biomolecular Chemistry (2019), 17(41), 9140-9150.

Scheme 252 (1 Reaction)

Steps: 1



31-116-CAS-23236769

Steps: 1

1.1 Reagents: Sodium trifluoromethanesulfonate, Silver fluoride, Water-*d*₂Catalysts: (α,β)-1,3-Dioxo- α -(phenylmethyl)-1*H*-benz[*d*₂]isoquinoline-2(3*H*)-acetic acid, Bis(η^2 -ethene)[(8a,9,10,11,11a- η)-(2a*S*)-1,2,3,4-tetrahydro-7,13-dimethoxy-8*H*-cyclopenta[5,6]cyclonona[1,2,3-*cd*:1,9,8-*c'd*]diinden-8a(12*H*)-yl]rhodiumSolvents: Methanol-*d*₄; 6 h, 80 °C

Enantioselective Synthesis of Azoniahelicenses by Rh-Catalyzed C-H Annulation with Alkynes

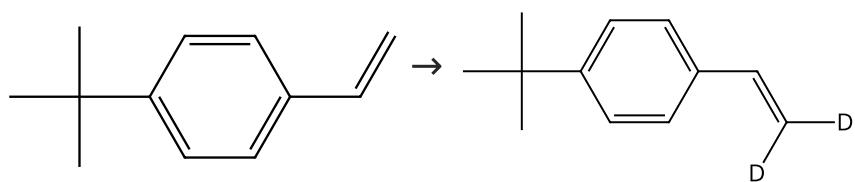
By: Wang, Qiang; et al

Journal of the American Chemical Society (2021), 143(1), 114-120.

Experimental Protocols

Scheme 253 (1 Reaction)

Steps: 1



Suppliers (60)

Supplier (1)

31-116-CAS-14048915

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ^1,κ^3)rhodiumSolvents: Methanol-*d*; 2.5 h, 25 °C

Experimental Protocols

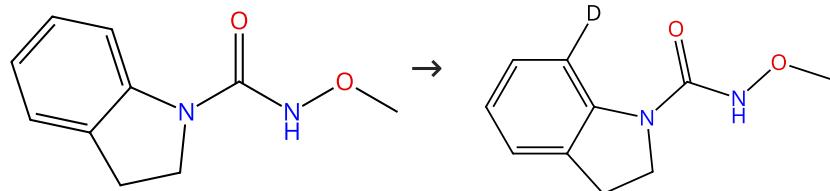
Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 254 (1 Reaction)

Steps: 1



Suppliers (3)

31-116-CAS-7092751

Steps: 1

1.1 Reagents: Sodium acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*; 3 h, 80 °C

Experimental Protocols

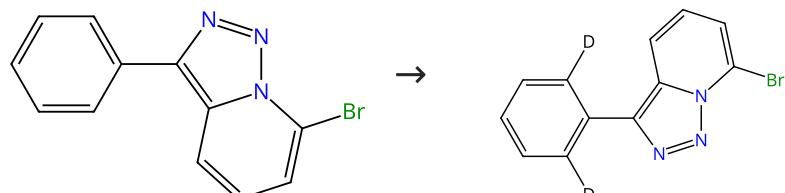
Access to Six- and Seven-Membered 1,7-Fused Indolines via Rh(III)-Catalyzed Redox-Neutral C7-Selective C-H Functionalization of Indolines with Alkynes and Alkenes

By: Wang, Xuan; et al

Journal of Organic Chemistry (2015), 80(12), 6238-6249.

Scheme 255 (1 Reaction)

Steps: 1



Suppliers (2)

31-614-CAS-36701774

Steps: 1

1.1 Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoro antimonate(1-) (1:2)Solvents: Methanol-*d*, 1,1,1,3,3-Hexafluoro-2-propanol; 30 min, 50 °C

Experimental Protocols

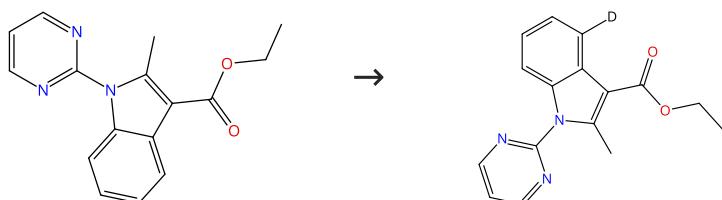
The Pyridotriazole Works as a Traceless Directing Group: A C-H Activation/Annulation Cascade Reaction with Iodonium Ylides

By: Lv, Guanghui; et al

Organic Letters (2023), 25(22), 4022-4027.

Scheme 256 (1 Reaction)

Steps: 1



31-116-CAS-4710528

Steps: 1

1.1 Reagents: Acetic acid-*d*₄Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*C₆-11)-hexafluoro antimonate(1-) (1:2)Solvents: Methanol-*d*, 12 h, 80 °C**Rhodium(III)-Catalyzed Synthesis of Indole Derivatives From Pyrimidyl-Substituted Anilines and Diazo Compounds**

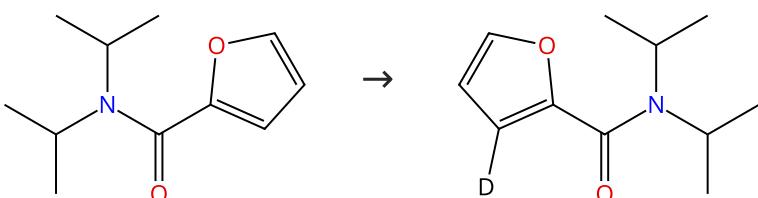
By: Yu, Ke; et al

Advanced Synthesis & Catalysis (2016), 358(4), 661-666.

Experimental Protocols

Scheme 257 (2 Reactions)

Steps: 1



Suppliers (8)

31-116-CAS-6766853

Steps: 1

1.1 Reagents: Methanol-*d*₄, *N*-BromophthalimideCatalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*C₆-11)-hexafluoro antimonate(1-) (1:2)

Solvents: 1,2-Dichloroethane; 16 h, 60 °C; 60 °C → rt

Dual Role of Rh(III) Catalyst Enables Regioselective Halogenation of (Electron-Rich) Heterocycles

By: Schroeder, Nils; et al

Journal of the American Chemical Society (2015), 137(4), 1448-1451.

Experimental Protocols

31-116-CAS-8903620

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*C₆-11)-hexafluoro antimonate(1-) (1:2)

Solvents: 1,2-Dichloroethane; 16 h, 60 °C; 60 °C → rt

Dual Role of Rh(III) Catalyst Enables Regioselective Halogenation of (Electron-Rich) Heterocycles

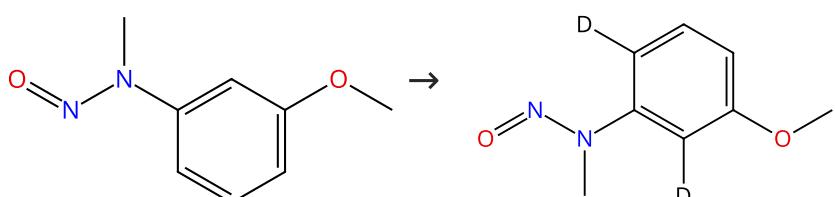
By: Schroeder, Nils; et al

Journal of the American Chemical Society (2015), 137(4), 1448-1451.

Experimental Protocols

Scheme 258 (1 Reaction)

Steps: 1



Suppliers (8)

31-116-CAS-8727288

Steps: 1

1.1 Reagents: Silver acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: Methanol-d₄; 3 h, 30 °C

Experimental Protocols

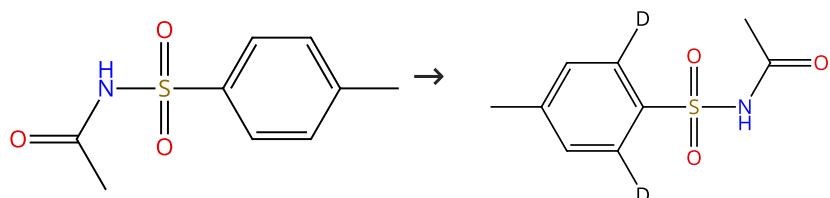
Rhodium(III)-Catalyzed N-Nitroso-Directed C-H Olefination of Arenes. High-Yield, Versatile Coupling under Mild Conditions

By: Liu, Baoqing; et al

Journal of the American Chemical Society (2013), 135(1), 468-473.

Scheme 259 (1 Reaction)

Steps: 1



Suppliers (66)

31-116-CAS-23847294

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-d₄, OxygenCatalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Ethyl acetate; 30 h, 120 °C

Experimental Protocols

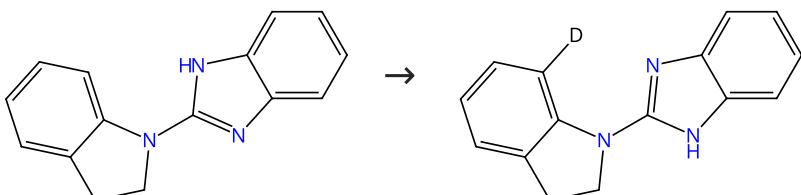
Synthesis of Succinimide Spiro-Fused Sultams from the Reaction of N-(Phenylsulfonyl)acetamides with Maleimides via C(sp²)-H Activation

By: Hu, Bing; et al

Journal of Organic Chemistry (2021), 86(15), 10330-10342.

Scheme 260 (2 Reactions)

Steps: 1



Suppliers (2)

31-614-CAS-37013637

Steps: 1

1.1 Reagents: Potassium carbonate, Methanol-d₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 24 h, 80 °C

Experimental Protocols

Assembly of fluorinated benzodiazepines via Rh(III)-catalysed [5+2] annulation of N-benzo[d]imidazole indolines with 2,2-difluorovinyl tosylate

By: Liu, Fu-Xiaomin; et al

New Journal of Chemistry (2023), 47(27), 12589-12594.

31-116-CAS-19878204

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-d₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 12 h, 80 °C

Experimental Protocols

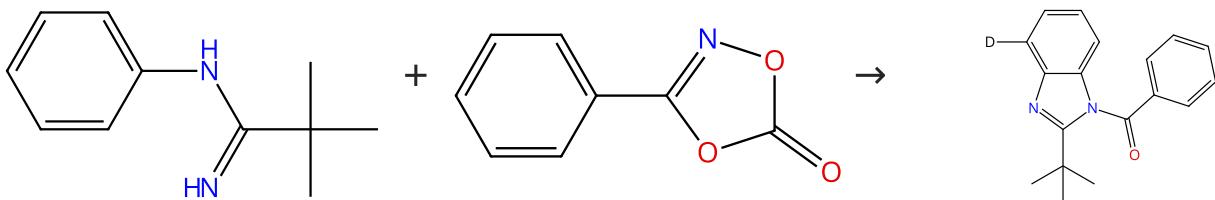
Rh(III)-Catalyzed [5 + 2] Oxidative Annulation of Cyclic Arylguanidines and Alkynes to 1,3-Benzodiazepines. A Striking Mechanistic Proposal from DFT

By: Martinez-Yanez, Nuria; et al

Organic Letters (2019), 21(6), 1779-1783.

Scheme 261 (1 Reaction)

Steps: 1



Suppliers (6)

Suppliers (41)

31-614-CAS-24225251

Steps: 1

1.1 **Reagents:** Zinc acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluorophosphate
Solvents: Ethyl acetate; 3 h, 110 °C; 110 °C → rt

Synthesis of N-acylbenzimidazoles through [4 + 1] annulation of N-arylpivalimidamides with dioxazolones

By: Song, Xia; et al

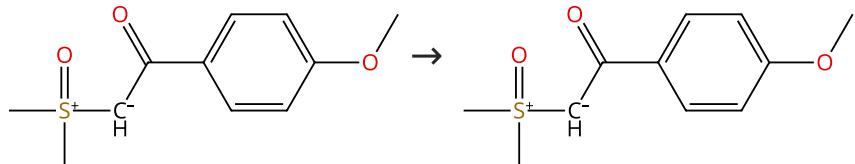
Organic Chemistry Frontiers (2021), 8(22), 6265-6272.

1.2 **Reagents:** Water

Experimental Protocols

Scheme 262 (1 Reaction)

Steps: 1



31-614-CAS-35859243

Steps: 1

1.1 **Reagents:** Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,1,1,3,3-Hexafluoro-2-propanol; 2 h, 90 °C

Rh(III)-Catalyzed Chemodivergent Coupling of Sulfoxonium Ylides and Acryloyl Silanes

By: Zhou, Hui; et al

European Journal of Organic Chemistry (2022), 2022(40), e202200961.

Experimental Protocols

Scheme 263 (1 Reaction)

Steps: 1



31-116-CAS-20002470

Steps: 1

1.1 **Reagents:** Cupric acetate, Methanol-*d*, Lithium fluoride
Catalysts: Bis[dichloro[*n*⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 12 h, 120 °C; 120 °C → rt
1.2 **Solvents:** Water; 5 min, rt

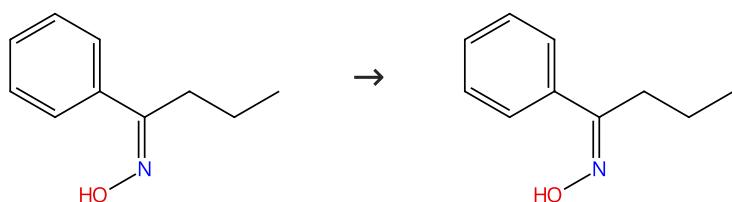
Rhodium(III)-Catalyzed C-H Vinylation of Arenes: Access to Functionalized Styrenes

By: Zhou, Jun; et al

Chinese Journal of Chemistry (2018), 36(12), 1143-1146.

Scheme 264 (1 Reaction)

Steps: 1



Suppliers (3)

31-614-CAS-29179661

Steps: 1

1.1 Reagents: Methanol-*d*₄, Dipotassium phosphate
 Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
 Solvents: Acetonitrile; 12 h, 80 °C

Rhodium-Catalysed [4+2] Annulation of Aromatic Oximes with Terminal Alkenes by C-H/N-O Functionalization towards 3,4-Dihydroisoquinolines

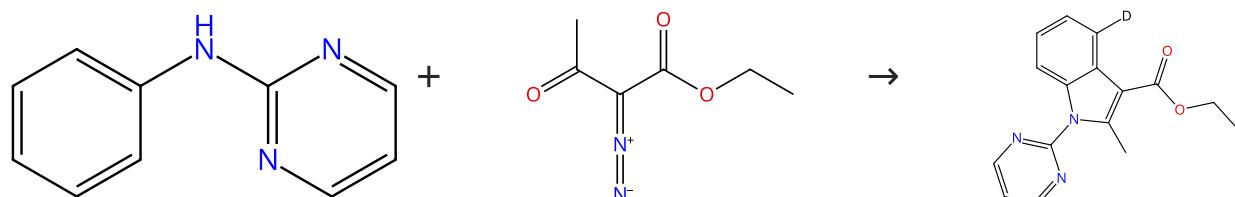
By: Zhang, Xu; et al

Advanced Synthesis & Catalysis (2019), 361(21), 4955-4960.

Experimental Protocols

Scheme 265 (1 Reaction)

Steps: 1



Suppliers (63)

Suppliers (41)

31-116-CAS-9580518

Steps: 1

1.1 Reagents: Acetic acid-*d*₄
 Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2)
 Solvents: Methanol-*d*₄; 12 h, 80 °C

Rhodium(III)-Catalyzed Synthesis of Indole Derivatives From Pyrimidyl-Substituted Anilines and Diazo Compounds

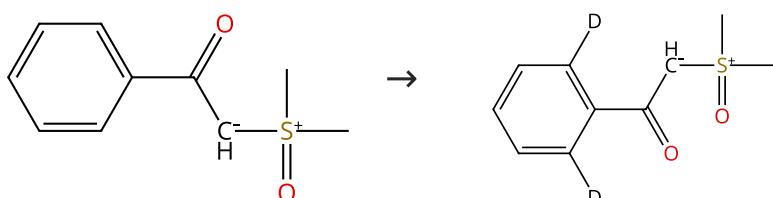
By: Yu, Ke; et al

Advanced Synthesis & Catalysis (2016), 358(4), 661-666.

Experimental Protocols

Scheme 266 (1 Reaction)

Steps: 1



Suppliers (38)

31-614-CAS-31102509

Steps: 1

1.1 Reagents: Methanol-*d*₄
 Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
 Solvents: 2,2,2-Trifluoroethanol; 30 min, 70 °C

Rh(III)-Catalyzed Cross-Coupling/Annulation of Two Carbene Precursors: Construction of Dihydrobenzo[c]chromen-6-one Scaffolds and

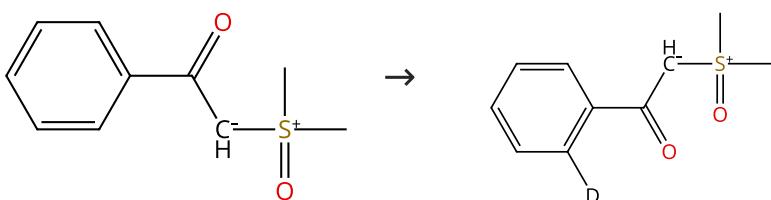
By: Kumar, Sanjeev; et al

Asian Journal of Organic Chemistry (2022), 11(1), e202100689.

Experimental Protocols

Scheme 267 (1 Reaction)

Steps: 1



Suppliers (38)

31-614-CAS-36411285

Steps: 1

- 1.1 **Reagents:** Sodium carbonate, Methanol-*d*₄, Monopotassium phosphate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver
Solvents: 1,2-Dichloroethane; 4 - 12 h, 70 °C

Experimental Protocols

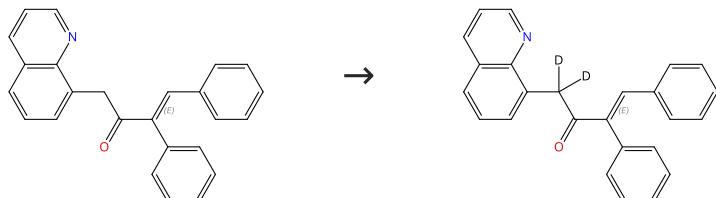
Rhodium-Catalyzed Direct Vinylene Annulation of Sulfoxonium Ylides and N-carbamoylindoles with Vinylene Carbonate

By: Song, Jia-Lin; et al

Advanced Synthesis & Catalysis (2023), 365(9), 1457-1464.

Scheme 268 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

31-116-CAS-17395190

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄
Catalysts: Pivalic acid, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver
Solvents: Toluene, Chlorobenzene; 24 h, 90 °C

Experimental Protocols

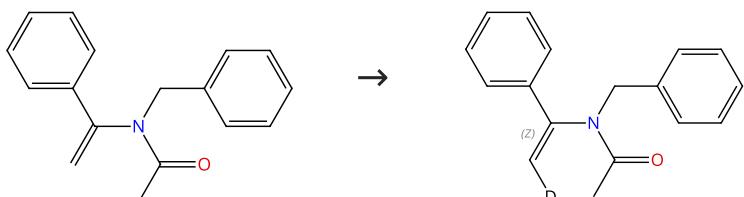
Rhodium(III)-Catalyzed Acylation of C(sp³)-H bonds with Cyclopropenones

By: Kong, Lingheng; et al

Organic Letters (2017), 19(13), 3644-3647.

Scheme 269 (1 Reaction)

Steps: 1



Double bond geometry shown

31-614-CAS-40194935

Steps: 1

- 1.1 **Reagents:** Acetic acid, Cupric acetate, Methanol-*d*₄, Silver hexafluoroantimonate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Tetrahydrofuran; 16 h, 100 °C

Experimental Protocols

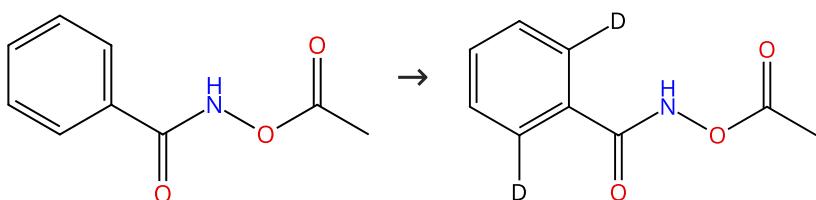
Rhodium(III)-Catalyzed Switchable β-C(sp²)-H Alkenylation and Alkylation of Acyclic Enamides with Allyl Alcohols

By: Li, Xiaolan; et al

Organic Letters (2024), 26(17), 3673-3678.

Scheme 270 (1 Reaction)

Steps: 1



Suppliers (9)

31-116-CAS-23154270

Steps: 1

- 1.1 **Reagents:** Acetic acid, Cesium acetate, Oxygen, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol- d_4 ; 12 h, rt

Experimental Protocols

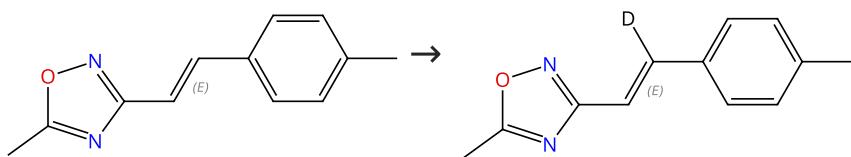
Lossen Rearrangement vs C-N Reductive Elimination Enabled by Rh(III)-Catalyzed C-H Activation/Selective Lactone Ring-Opening: Chemodivergent Synthesis of Quinol inones and Dihydroisoquinolinones

By: Bian, Mengyao; et al

Organic Letters (2020), 22(24), 9677-9682.

Scheme 271 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

31-116-CAS-17816020

Steps: 1

- 1.1 **Catalysts:** Cupric acetate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2-Methyl-2-butanol, 2,2,2-Trifluoroethan-1,1- d_2 -ol- d ; 18 h, 110 °C

Experimental Protocols

Rhodium(III)-Catalyzed Oxadiazole-Directed Alkenyl C-H Activation for Synthetic Access to 2-Acylamino and 2-Amino Pyridines

By: Yang, Fan; et al

Journal of Organic Chemistry (2017), 82(19), 9978-9987.

Scheme 272 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

31-116-CAS-17853631

Steps: 1

- 1.1 **Reagents:** Cupric acetate, Silver oxide (Ag_2O)
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol- d_4 , 1,1,1,3,3-Hexafluoro-2-propanol; 14 h, 40 °C

Experimental Protocols

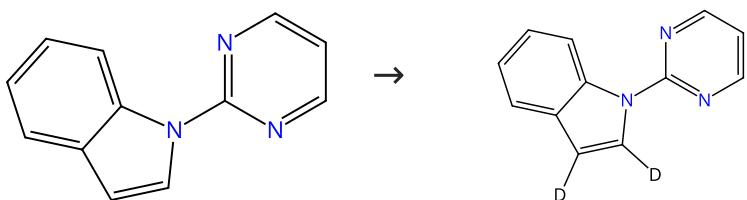
Regiocontrolled direct C4 and C2-methyl thiolation of indoles under rhodium-catalyzed mild conditions

By: Maity, Saurabh; et al

Chemical Communications (Cambridge, United Kingdom) (2017), 53(90), 12197-12200.

Scheme 273 (2 Reactions)

Steps: 1



Suppliers (59)

31-614-CAS-35248073

Steps: 1

- 1.1 **Reagents:** Acetic acid, Sodium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane, 1,1,1,3,3,3-Hexafluoro-2-propanol; 24 h, 120 °C

Experimental Protocols

Rhodium(III)-catalyzed regioselective C2-alkenylation of indoles with CF₃-imidoyl sulfoxonium ylides to give multi-functionalized enamines using a migratable directing group

By: Yang, Zuguang; et al

Chemical Communications (Cambridge, United Kingdom) (2023), 59(3), 318-321.

31-614-CAS-24291996

Steps: 1

- 1.1 **Reagents:** Acetic acid-*d*, Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2); 12 h, 120 °C

Experimental Protocols

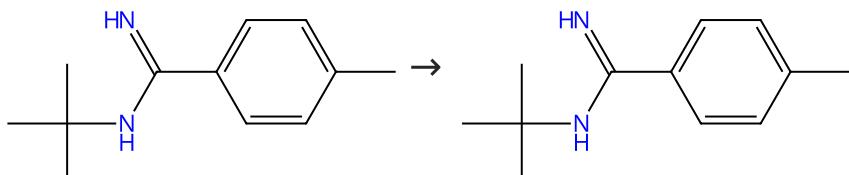
Rh(III)-Catalyzed Divergent C2-carboxymethylation of Indoles and C7-formylmethylation of Indolines with Vinylene Carbonate

By: Hu, Weinan; et al

Asian Journal of Organic Chemistry (2021), 10(10), 2557-2561.

Scheme 274 (1 Reaction)

Steps: 1



Suppliers (4)

Suppliers (3)

31-614-CAS-24908997

Steps: 1

- 1.1 **Catalysts:** Silver triflate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)
Solvents: Toluene, Methanol-*d*₄; 24 h, 100 °C

Experimental Protocols

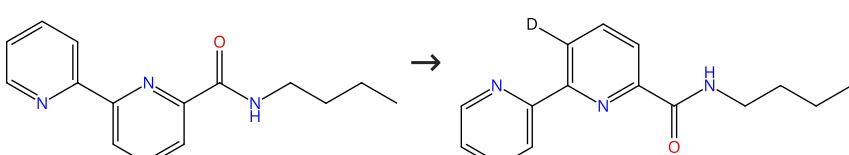
Synthesis of aminoisoquinolines via Rh-catalyzed [4 + 2] annulation of benzamidamides with vinylene carbonate

By: Huang, Xin; et al

Chinese Chemical Letters (2021), 32(11), 3518-3521.

Scheme 275 (1 Reaction)

Steps: 1



31-116-CAS-20540723

Steps: 1

1.1 Reagents: Sodium acetate

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: Methanol- d_4 ; 24 h, 120 °C

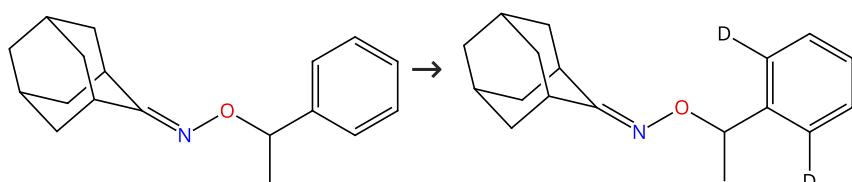
Rhodium(III)-Catalyzed Regioselective C3-H Acylmethylation of [2,2'-Bipyridine]-6-carboxamides with Sulfoxonium Ylides

By: Yu, Jia; et al

Organic Letters (2019), 21(16), 6366-6369.

Scheme 276 (1 Reaction)

Steps: 1



31-116-CAS-19237385

Steps: 1

1.1 Reagents: Methanol- d_4 , Propanoic acid, 2,2-dimethyl-, silver (1+) salt (1:1)Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; rt → 80 °C; overnight, 80 °C

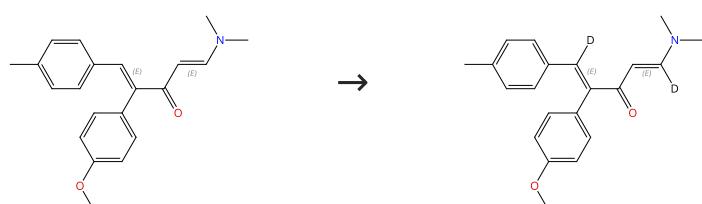
Rhodium(III)-catalyzed directed amidation of unactivated C (sp^3)-H bonds to afford 1,2-amino alcohol derivatives

By: Dong, Yi; et al

Chemical Communications (Cambridge, United Kingdom) (2018), 54(79), 11096-11099.

Scheme 277 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

31-116-CAS-19948710

Steps: 1

1.1 Reagents: Silver acetate, Methanol- d_4 , WaterCatalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; 12 h, 90 °C

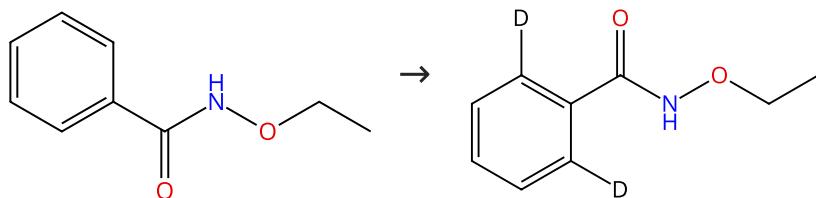
Rh(III)-Catalyzed regioselective C-H [4+2] C-annulation of vinyl enaminones with alkynes to form polysubstituted salicylaldehydes

By: Zhao, Yinsong; et al

Organic Chemistry Frontiers (2018), 5(19), 2875-2879.

Scheme 278 (1 Reaction)

Steps: 1



Suppliers (22)

31-116-CAS-22410601

Steps: 1

1.1 Reagents: Methanol- d_4 , Cesium acetateCatalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]

Solvents: Dichloromethane; 2 h, rt

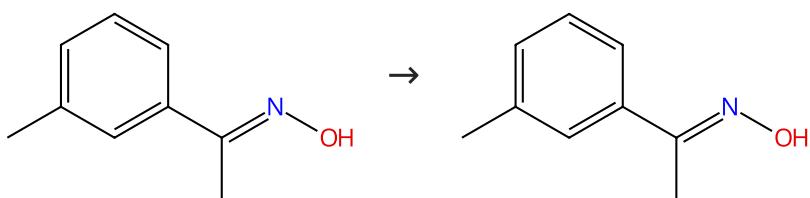
Synthesis of isoquinolinone derivatives by Rh (III)-catalyzed C-H functionalization of N-ethoxybenzamides

By: Chen, Junyu; et al

Synthetic Communications (2020), 50(12), 1799-1812.

Scheme 279 (1 Reaction)

Steps: 1



Suppliers (4)

31-614-CAS-26223741

Steps: 1

1.1 Reagents: Succinic acid

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-d₄; 12 h, 90 °C

Rhodium-Catalyzed C-H Activation/Annulation Cascade of Aryl Oximes and Propargyl Alcohols to Isoquinoline N-Oxides

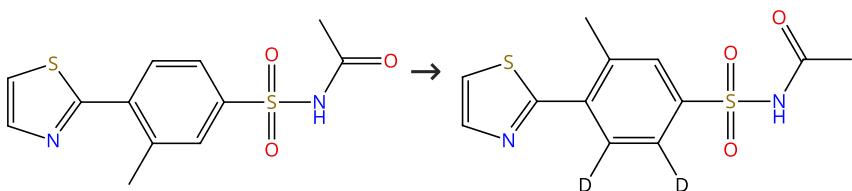
By: Li, Yuan; et al

Advanced Synthesis & Catalysis (2021), 363(13), 3305-3310.

Experimental Protocols

Scheme 280 (1 Reaction)

Steps: 1



31-116-CAS-21550903

Steps: 1

1.1 Reagents: Methanol-d₄Catalysts: Silver acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; overnight, 60 °C

Switching the site-selectivity of C-H activation in aryl sulfon amides containing strongly coordinating N-heterocycles

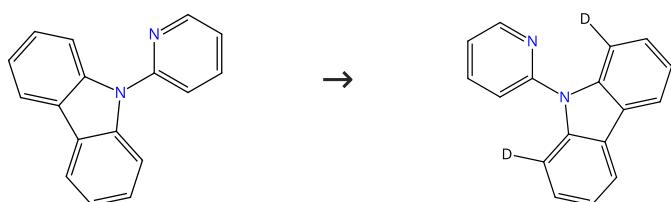
By: Dong, Yi; et al

Chemical Science (2019), 10(38), 8744-8751.

Experimental Protocols

Scheme 281 (1 Reaction)

Steps: 1



Suppliers (15)

31-614-CAS-37730398

Steps: 1

1.1 Reagents: Methanol-d₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 12 h, 60 °C

Rh(III)-Catalyzed Direct ortho Alkylation of Carbazoles with Nitroalkenes

By: Zhang, Liming; et al

Advanced Synthesis & Catalysis (2023), 365(20), 3461-3466.

Experimental Protocols

Scheme 282 (1 Reaction)

Steps: 1



31-116-CAS-21099245

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄, Propanoic acid, 2,2-dimethyl-, sodium salt (1:1)
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl]-κ*O*]methanesulfonamidato-κ*O*]silver
Solvents: 1,2-Dichloroethane; 60 min, 115 °C

Rh(III)-Catalyzed tandem indole C4-arylation/annulation with anthranils: access to indoloquinolines and their application in photophysical studies

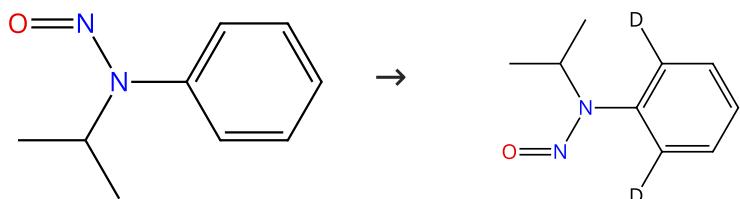
By: Biswas, Aniruddha; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(9), 1440-1443.

Experimental Protocols

Scheme 283 (1 Reaction)

Steps: 1



Suppliers (15)

31-614-CAS-37840262

Steps: 1

- 1.1 **Reagents:** Sodium acetate, Methanol-*d*₄, Silver hexafluoro antimonate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 100 °C

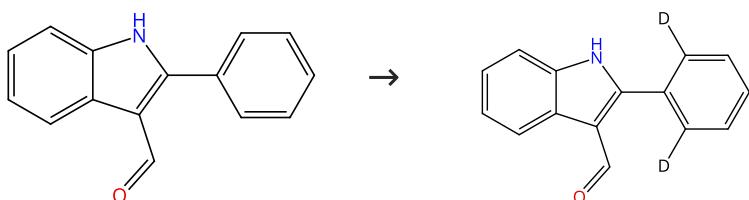
Rhodium-Catalyzed Regioselective Synthesis of N - Secondary Alkyl Indoles via Intermolecular Cyclization of N - Nitrosoanilines and Unsymmetrical Alkynes

By: Chang, Yiting; et al

Synthesis (2023), 55(23), 3969-3980.

Scheme 284 (1 Reaction)

Steps: 1



Suppliers (73)

31-614-CAS-31532888

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄, 1-Adamantanecarboxylic acid
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 2 h, 100 °C; 100 °C → rt

- 1.2 **Reagents:** Water

Experimental Protocols

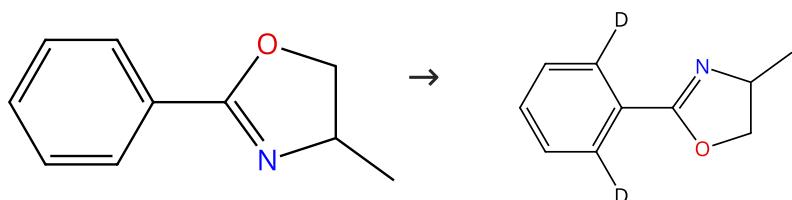
Rh(III)-Catalyzed Reaction of 2-Aryl-3-acyl-1H-indoles with α-Diazo Carbonyl Compounds: Synthesis of 5-Carbonyl Substituted Benzo[a]carbazoles via [5+1] Annulation

By: Li, Bin; et al

Asian Journal of Organic Chemistry (2022), 11(3), e202100710.

Scheme 285 (1 Reaction)

Steps: 1



Suppliers (5)

31-116-CAS-19598134

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-*N*-[(trifluoromethyl)sulfonyl]-κ*O*]methanesulfonamido-κ*O*silver; 12 h, 80 °C

Experimental Protocols

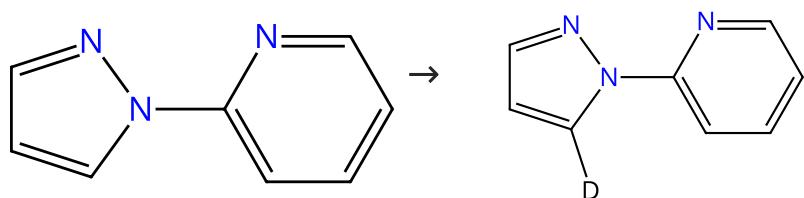
Rhodium(III)-Catalyzed Synthesis of N-(2-Acetoxyalkyl)isoquinolines from Oxazolines and Alkynes through C-N Bond Formation and Ring-Opening

By: Yang, Zi; et al

Advanced Synthesis & Catalysis (2019), 361(1), 214-218.

Scheme 286 (1 Reaction)

Steps: 1



Suppliers (75)

31-116-CAS-23299121

Steps: 1

1.1 Reagents: Silver acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Acetonitrile, Methanol-*d*; 24 h, rt → 90 °C

Experimental Protocols

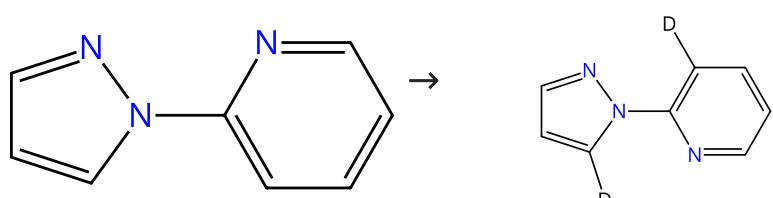
Rh(III)-Catalyzed switchable C-H monoalkenylation and dialkenylation of 2-(1H-pyrazol-1-yl)pyridine with alkenes via rollover cyclometalation

By: Meng, Haifang; et al

Organic Chemistry Frontiers (2021), 8(4), 773-777.

Scheme 287 (1 Reaction)

Steps: 1



Suppliers (75)

31-116-CAS-23300689

Steps: 1

1.1 Reagents: Silver acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*; 12 h, rt → 110 °C

Experimental Protocols

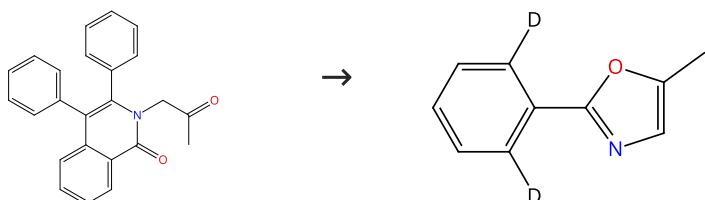
Rh(III)-Catalyzed switchable C-H monoalkenylation and dialkenylation of 2-(1H-pyrazol-1-yl)pyridine with alkenes via rollover cyclometalation

By: Meng, Haifang; et al

Organic Chemistry Frontiers (2021), 8(4), 773-777.

Scheme 288 (1 Reaction)

Steps: 1



31-116-CAS-23116487

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[trifluoromethyl]sulfonyl-κO]methanesulfonamidato-κO]silver; 12 h, 100 °C

Experimental Protocols

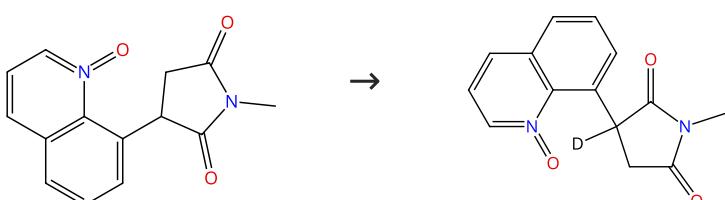
Rh(III)-Catalyzed three-component cascade annulation to produce the N-oxopropyl chain of isoquinolone derivatives

By: He, Yuan; et al

Organic & Biomolecular Chemistry (2021), 19(3), 561-567.

Scheme 289 (1 Reaction)

Steps: 1



31-116-CAS-23525197

Steps: 1

1.1 Reagents: Methanol-*d*₄, Acetic acid-*d*₄

Catalysts: Silver acetate, Silver hexafluoroantimonate, Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium

Solvents: 1,2-Dichloroethane; 6 h, 80 °C

Experimental Protocols

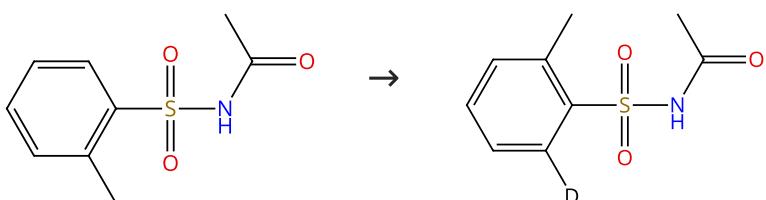
Rh(III)-Catalyzed Regioselective C8-Alkylation of Quinoline N-Oxides with Maleimides and Acrylates

By: Thakur, Ankita; et al

Journal of Organic Chemistry (2021), 86(9), 6612-6621.

Scheme 290 (2 Reactions)

Steps: 1



Suppliers (5)

31-116-CAS-20959873

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Sodium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Toluene; overnight, 120 °C

Experimental Protocols

Cp*Rh^{III}-Catalyzed Sulfonamide-Directed Ortho Arene C-H Carbenoid Functionalization with Pyridotriazoles

By: Dong, Yi; et al

Organic Letters (2020), 22(3), 772-775.

31-116-CAS-19596709

Steps: 1

1.1 Reagents: Methanol-*d*₄Catalysts: Silver acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane, Toluene; 60 °C

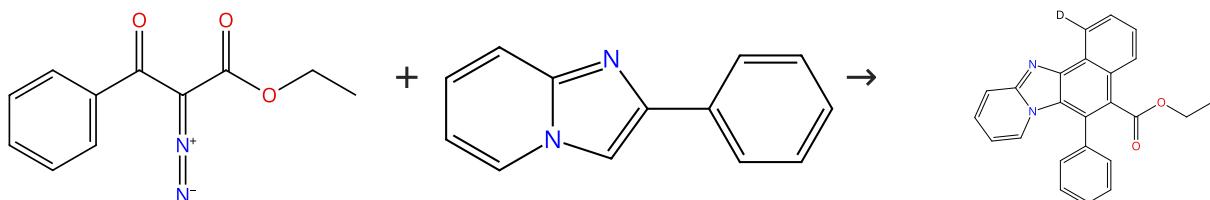
Rhodium(III)-catalyzed sulfonamide directed ortho C-H carbenoid functionalization via metal carbene migratory insertion

By: Dong, Yi; et al

Chemical Communications (Cambridge, United Kingdom) (2019), 55(14), 2027-2030.

Scheme 291 (1 Reaction)

Steps: 1



Suppliers (10)

Suppliers (83)

31-116-CAS-20692764

Steps: 1

1.1 Reagents: Acetic acid, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 2 h, 140 °C

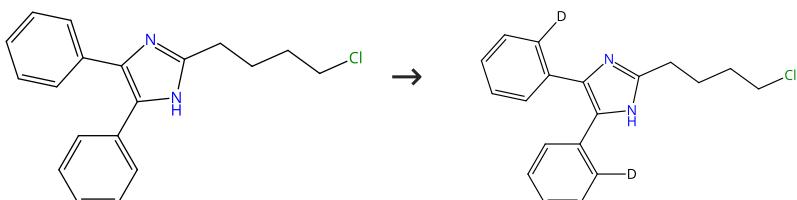
Synthesis of fused imidazo[1,2-a]pyridines derivatives through cascade C(sp²)-H functionalizations

By: Li, Bin; et al

Organic & Biomolecular Chemistry (2019), 17(41), 9140-9150.

Scheme 292 (1 Reaction)

Steps: 1



31-614-CAS-34877718

Steps: 1

1.1 Reagents: Methanol-*d*₄, Copper(II) triflateCatalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Methanol; 1 h, 100 °C

Experimental Protocols

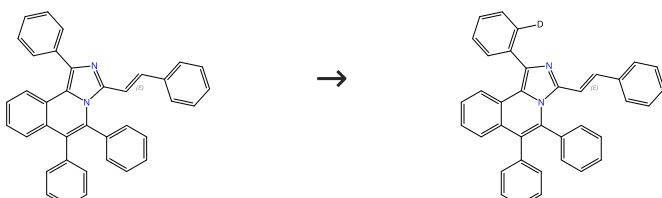
Experimental and computational studies on rhodium-catalyzed C4(5)aryl-H activation/annulation of imidazoles with alkynes: facile synthesis of six types of N-heterocycles

By: Tian, Ya-Nan; et al

Organic Chemistry Frontiers (2023), 10(1), 83-91.

Scheme 293 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

31-614-CAS-34877720

Steps: 1

1.1 Reagents: Methanol-*d*₄, Copper(II) triflateCatalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]; 1 h, 100 °C

Experimental Protocols

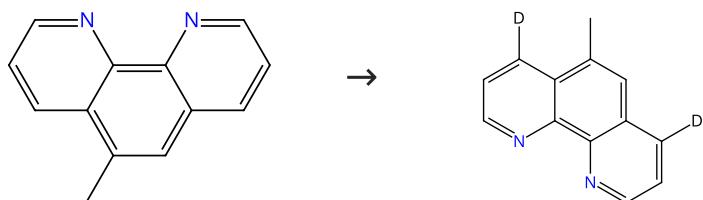
Experimental and computational studies on rhodium-catalyzed C4(5)aryl-H activation/annulation of imidazoles with alkynes: facile synthesis of six types of N-heterocycles

By: Tian, Ya-Nan; et al

Organic Chemistry Frontiers (2023), 10(1), 83-91.

Scheme 294 (1 Reaction)

Steps: 1



Suppliers (63)

31-116-CAS-22370920

Steps: 1

1.1 Reagents: Sodium formate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 3 h, 50 °C

Experimental Protocols

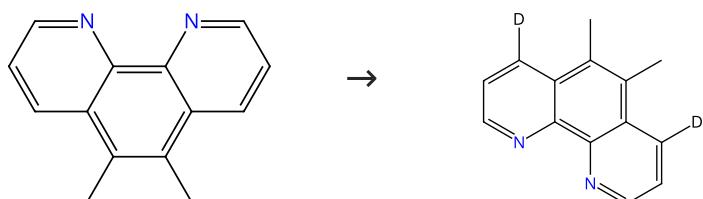
The Metallic Traveler: Formate- and Photoinduced Regioselective Phenanthroline Deuterations via Reductively Activated RhCp* Centers

By: Mengele, Alexander K.; et al

Organometallics (2020), 39(14), 2739-2748.

Scheme 295 (1 Reaction)

Steps: 1



Suppliers (71)

31-116-CAS-22370921

Steps: 1

1.1 Reagents: Sodium formate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 3 h, 50 °C

Experimental Protocols

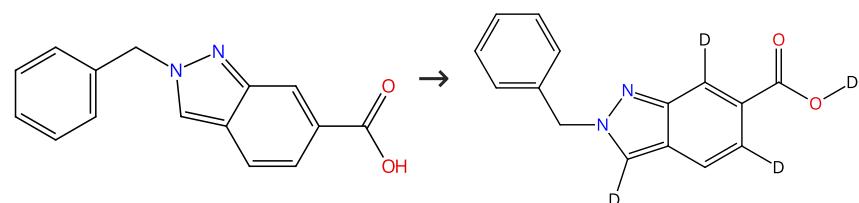
The Metallic Traveler: Formate- and Photoinduced Regioselective Phenanthroline Deuterations via Reductively Activated RhCp* Centers

By: Mengele, Alexander K.; et al

Organometallics (2020), 39(14), 2739-2748.

Scheme 296 (1 Reaction)

Steps: 1



31-614-CAS-42450396

Steps: 1

1.1 Reagents: Acetic acid-*d*, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
 Solvents: 2,2,2-Trifluoroethanol; 0.5 h, 80 °C

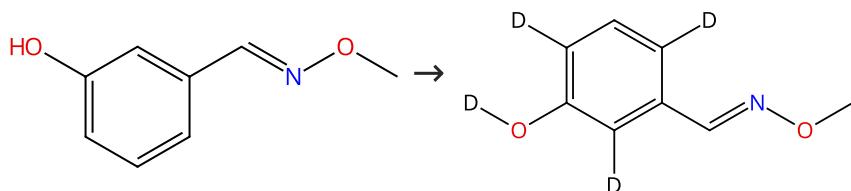
Microwave-Assisted Rhodium (III)-Catalyzed [3+3] Annulation of 2-Benzyl-2H-Indazole-6-carboxylic Acids with Iodonium Ylides: A Regioselective Synthesis of Indazole-Fused Chromenes

By: Chen, Hong-Ren; et al

Advanced Synthesis & Catalysis (2025), 367(1), e202400756.

Scheme 297 (1 Reaction)

Steps: 1



Suppliers (3)

31-116-CAS-6504531

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 24 h, 60 °C

Experimental Protocols

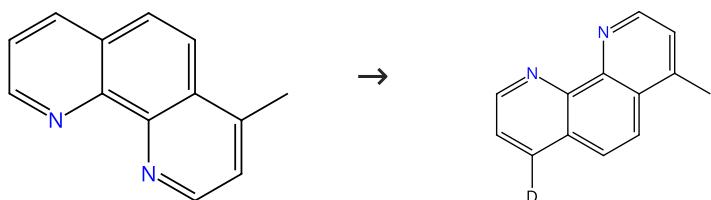
Rh^{III}-catalyzed dual directing group assisted sterically hindered C-H bond activation: a unique route to meta and ortho substituted benzofurans

By: Yeh, Chien-Hung; et al

Organic & Biomolecular Chemistry (2014), 12(45), 9105-9108.

Scheme 298 (1 Reaction)

Steps: 1



Suppliers (73)

31-116-CAS-22370919

Steps: 1

1.1 Reagents: Sodium formate, Methanol-*d*₄
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 3 h, 50 °C

Experimental Protocols

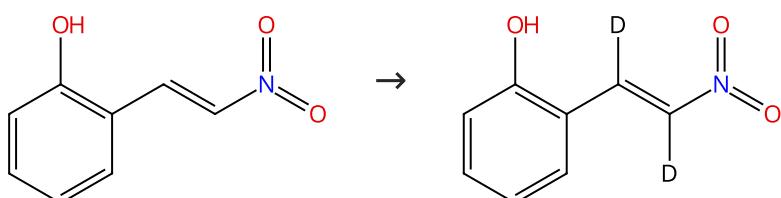
The Metallic Traveler: Formate- and Photoinduced Regioselective Phenanthroline Deuterations via Reductively Activated RhCp* Centers

By: Mengele, Alexander K.; et al

Organometallics (2020), 39(14), 2739-2748.

Scheme 299 (1 Reaction)

Steps: 1



Suppliers (21)

31-614-CAS-32060520

Steps: 1

1.1 Reagents: Methanol-*d*₄, Cesium acetate
 Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
 Solvents: Tetrahydrofuran; 2 h, 60 °C

Experimental Protocols

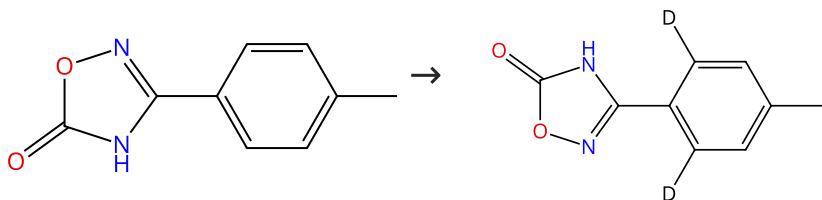
Site-selective rhodium carbene transfer of 2-hydroxy-β-nitrostyrenes with diazo compounds En route to 2-alkylated benzofurans

By: Zhang, Haiman; et al

Organic Chemistry Frontiers (2022), 9(12), 3268-3273.

Scheme 300 (1 Reaction)

Steps: 1



Suppliers (10)

31-614-CAS-40731208

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄, 1-Adamantanecarboxylic acid
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 10 h, 80 °C; 80 °C → rt

1.2 **Reagents:** Sodium chloride
Solvents: Water; rt

Rh(III)-catalyzed C(sp²)-H functionalization/[4+2] annulation of oxadiazolones with iodonium ylides to access diverse fused-isoquinolines and fused-pyridines

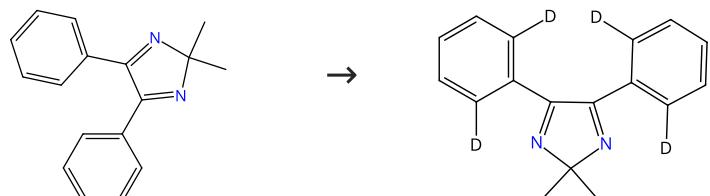
By: Chen, Wang-Liang; et al

Chemical Communications (Cambridge, United Kingdom) (2024), 60(51), 6560-6563.

Experimental Protocols

Scheme 301 (2 Reactions)

Steps: 1



 Suppliers (5)

31-614-CAS-40982252

Steps: 1

- 1.1 Reagents:** Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethanol; 0.5 h, 120 °C

Rh(III)-Catalyzed sequential ring-retentive/-opening [4 + 2] annulations of 2H-imidazoles towards full-color emissive imidazo[5,1-a]isoquinolinium salts and AIE-active non-symmetric 1,1'-biisoquinolines

By: Zhu, Peiyan; et al

Chinese Chemical Letters (2024), 35(10), 109533.

31-614-CAS-38397424

Steps: 1

- 1.1 Reagents:** Cupric acetate, Methanol-*d*₄, Oxygen
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethanol; 0.5 h, 120 °C

Mechanistic insights into an NH₄OAc-promoted imine dance in Rh-catalysed multicomponent double C-H annulations through an N-retention/exchange dual channel

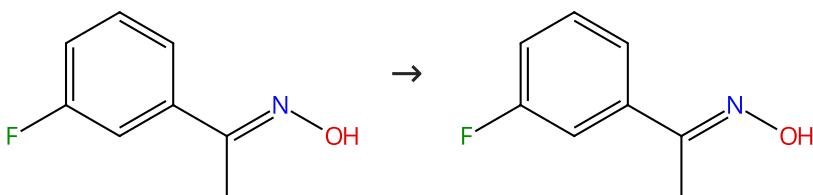
By: Li, Shiqing; et al

Chemical Science (2023), 14(46), 13446-13452.

Experimental Protocols

Scheme 302 (1 Reaction)

Steps: 1



Suppliers (17)

31-614-CAS-25393175

Steps: 1

1.1 Reagents: Succinic acid
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 12 h, 90 °C

Rhodium-Catalyzed C-H Activation/Annulation Cascade of Aryl Oximes and Propargyl Alcohols to Isoquinoline N-Oxides

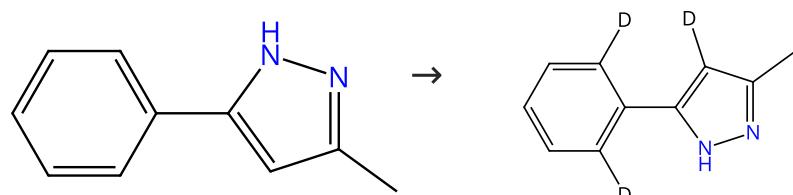
By: Li, Yuan; et al

Advanced Synthesis & Catalysis (2021), 363(13), 3305-3310.

Experimental Protocols

Scheme 303 (1 Reaction)

Steps: 1



Suppliers (76)

31-614-CAS-35273640

Steps: 1

1.1 Reagents: Silver acetate, Methanol-*d*₄, Disodium phosphate, Water-*d*₂
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamido-κO]silver; 12 h, rt → 110 °C

Rh(III)-catalyzed [4 + 1] cyclization of aryl substituted pyrazoles with cyclopropanols via C-H activation

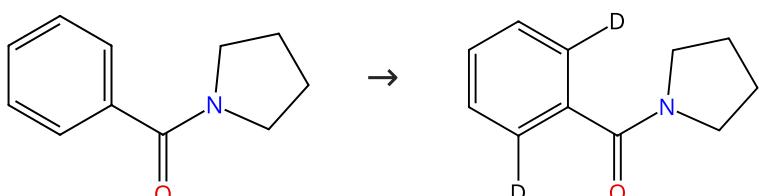
By: Chen, Wenxi; et al

Organic & Biomolecular Chemistry (2023), 21(4), 775-782.

Experimental Protocols

Scheme 304 (1 Reaction)

Steps: 1



Suppliers (43)

31-614-CAS-36929564

Steps: 1

1.1 Reagents: Sodium acetate, Methanol-*d*₄, Silver hexafluoro antimonate
Catalysts: Rhodium, di-μ-iododiodobis[(11a,12,13,14,14a-η)-4,5,6,7,11-pentahydro-1,10-dimethoxy-2,4,4,7,7,9-hexamethyl cyclopent[5,6]indeno[7,1':8,9,1]cyclonon[1,2,3-*cd*]inden-11a-yl]di-, stereoisomer
Solvents: 1,2-Dichloroethane; 24 h, 80 °C

Synthesis of Hexamethyl-1,1'-spirobiindane-Based Chiral Spiro Cp Ligands and Their Application in Rhodium-Catalyzed Enantioselective Aryl C-H Addition to Nitroalkenes

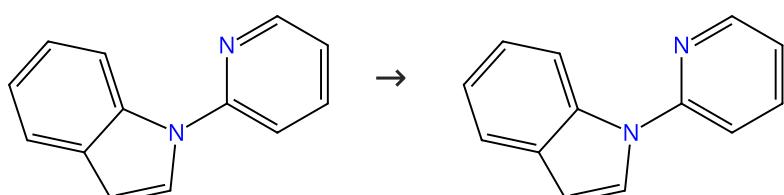
By: Yang, Hui; et al

ACS Catalysis (2023), 13(13), 8838-8844.

Experimental Protocols

Scheme 305 (1 Reaction)

Steps: 1



Suppliers (36)

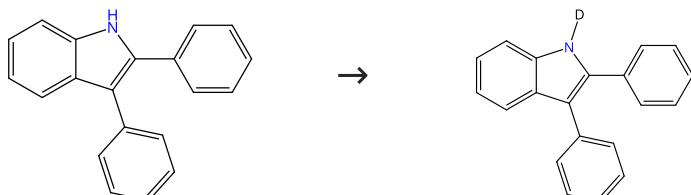
31-614-CAS-35766125

Steps: 1

Synthesis of 2-(2-Nitroalkyl)indoles by Rhodium(III)-Catalyzed C-H Alkylation

By: Liu, Shuang-Liang; et al

Organic Letters (2023), 25(9), 1375-1379.

1.1 Reagents: Methanol-*d*₄
Catalysts: Silver trifluoroacetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 6 h, 70 °C
Experimental Protocols

Suppliers (68)

Steps: 1

31-116-CAS-10835551

Steps: 1

General and Efficient Synthesis of Indoles through Triazene-Directed C-H Annulation

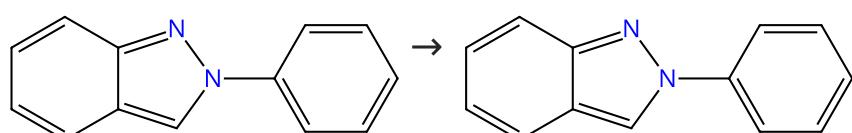
By: Wang, Chengming; et al

Angewandte Chemie, International Edition (2013), 52(22), 5795-5798.

1.1 Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 3 h, 90 °C
Experimental Protocols

Scheme 307 (1 Reaction)

Steps: 1



Suppliers (36)

31-614-CAS-27512629

Steps: 1

Synthesis of Fused or Spiro Polycyclic Compounds via the Dehydrogenative Annulation Reactions of 2-Arylindazoles with Maleimides

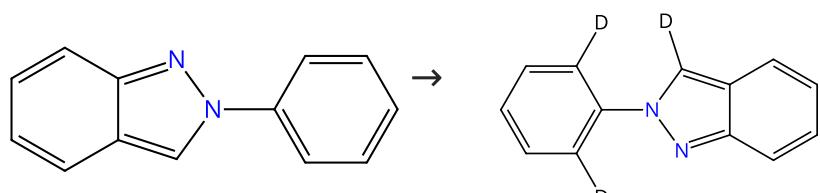
By: Guo, Chenhao; et al

Organic Letters (2019), 21(18), 7189-7193.

1.1 Reagents: Methanol-*d*₄, 1-Adamantanecarboxylic acid, *N*-Methylmaleimide, Oxygen
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Toluene; 16 h, 120 °C; 120 °C → rt
1.2 Reagents: Water; rt
Experimental Protocols

Scheme 308 (1 Reaction)

Steps: 1



Suppliers (36)

31-614-CAS-24036144

Steps: 1

- 1.1 Reagents:** Methanol-*d*₄, Silver hexafluoroantimonate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; rt; 16 h, 100 °C

Experimental Protocols

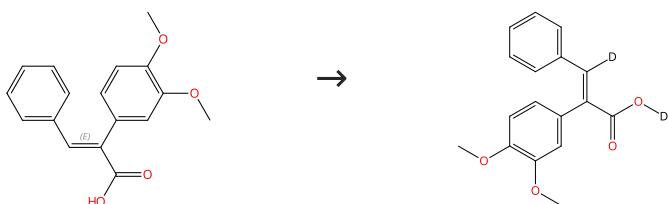
Rhodium(III)-Catalyzed Dehydrogenative Annulation of 2-Arylindazoles with Cyclic Enones

By: Chary Devulapally, Yogananda; et al

European Journal of Organic Chemistry (2021), 2021(21), 3083-3090.

Scheme 309 (1 Reaction)

Steps: 1



Double bond geometry shown

Suppliers (2)

31-614-CAS-40255495

Steps: 1

- 1.1 Reagents:** Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 1 h, 100 °C

Experimental Protocols

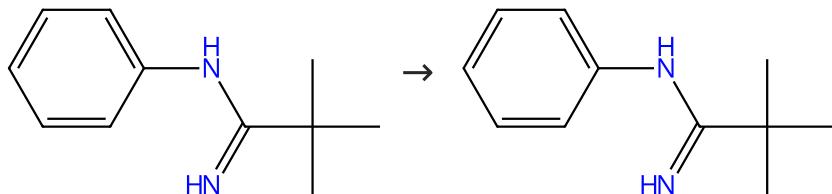
Rh(III)-catalysed C-H annulation of cis-stilbene acids with 2-diazo-1,3-diketones: facile access to 6,7-dihydrobenzofuran-4(5H)-one and α-pyrone scaffolds

By: Galla, Mary Sravani; et al

Organic & Biomolecular Chemistry (2024), 22(19), 3933-3939.

Scheme 310 (2 Reactions)

Steps: 1



Suppliers (6)

31-614-CAS-28508766

Steps: 1

- 1.1 Reagents:** Methanol-*d*₄, 1-Adamantanecarboxylic acid
Catalysts: Cesium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 1 h, 60 °C; 60 °C → rt

- 1.2 Reagents:** Sodium bicarbonate
Solvents: Water; rt

Experimental Protocols

Synthesis of 3-spirooxindole 3H-indoles through Rh(III)-catalyzed [4 + 1] redox-neutral spirocyclization of N-aryl amidines with diazo oxindoles

By: Zhou, Qianting; et al

Organic Chemistry Frontiers (2021), 8(15), 4131-4137.

31-614-CAS-28169146

Steps: 1

- 1.1 Catalysts:** Copper diacetate monohydrate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 10 min, 90 °C

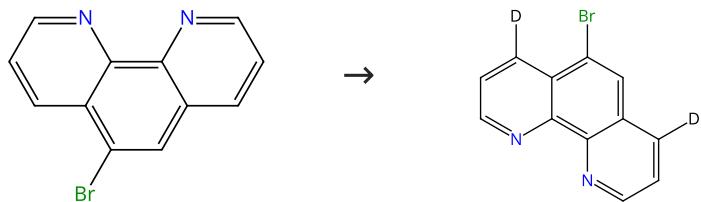
Synthesis of 1,3-Benzodiazepines through [5 + 2] Annulation of N-Aryl Amidines with Propargylic Esters

By: Song, Xia; et al

Organic Letters (2020), 22(24), 9506-9512.

Scheme 311 (1 Reaction)

Steps: 1



Suppliers (69)

31-116-CAS-22370923

Steps: 1

1.1 Reagents: Sodium formate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 3 h, 50 °C

Experimental Protocols

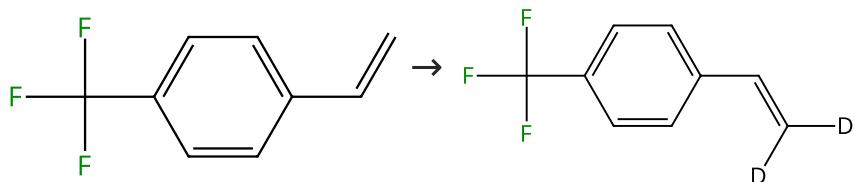
The Metallic Traveler: Formate- and Photoinduced Regioselective Phenanthroline Deuterations via Reductively Activated RhCp* Centers

By: Mengele, Alexander K.; et al

Organometallics (2020), 39(14), 2739-2748.

Scheme 312 (1 Reaction)

Steps: 1



Suppliers (71)

31-116-CAS-10060475

Steps: 1

1.1 Reagents: Methanol-*d*
Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato-κ*N*¹,κ*O*⁸)rhodium
Solvents: Methanol-*d*; 6 h, 25 °C

Experimental Protocols

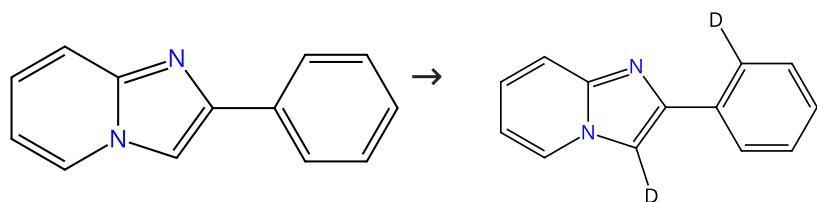
Mild and Selective H/D Exchange at the β Position of Aromatic α-Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 313 (1 Reaction)

Steps: 1



Suppliers (83)

31-116-CAS-20692763

Steps: 1

1.1 Reagents: Acetic acid, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 2 h, 140 °C

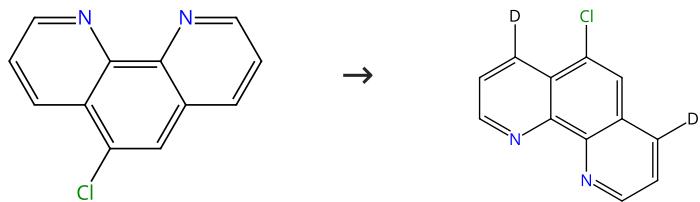
Synthesis of fused imidazo[1,2-a]pyridines derivatives through cascade C(sp²)-H functionalizations

By: Li, Bin; et al

Organic & Biomolecular Chemistry (2019), 17(41), 9140-9150.

Scheme 314 (1 Reaction)

Steps: 1



Suppliers (71)

31-116-CAS-22370922

Steps: 1

1.1 **Reagents:** Sodium formate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 3 h, 50 °C

Experimental Protocols

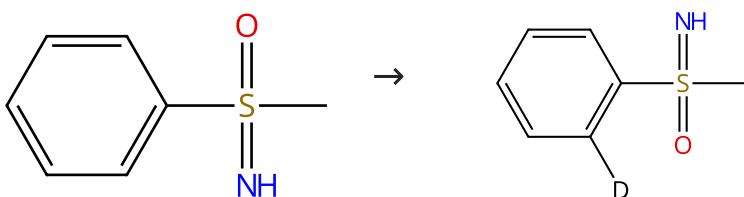
The Metallic Traveler: Formate- and Photoinduced Regioselective Phenanthroline Deuteriations via Reductively Activated RhCp* Centers

By: Mengele, Alexander K.; et al

Organometallics (2020), 39(14), 2739-2748.

Scheme 315 (1 Reaction)

Steps: 1



Suppliers (49)

31-614-CAS-31176312

Steps: 1

1.1 **Reagents:** Pivalic acid, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethanol; 12 h, 80 °C

Experimental Protocols

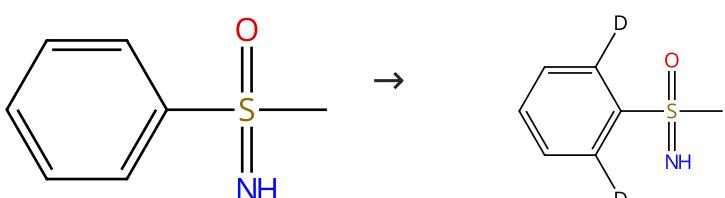
Rhodium(III)-catalyzed cascade C-H functionalization/annulation of sulfoximes with iodonium ylides for the synthesis of cyclohexanone-1,2-benzothiazines

By: Chen, Lu; et al

Organic & Biomolecular Chemistry (2022), 20(4), 887-894.

Scheme 316 (3 Reactions)

Steps: 1



Suppliers (49)

31-614-CAS-40127591

Steps: 1

1.1 **Reagents:** Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluorophosphate
Solvents: Methanol; 1 h, 90 °C

Experimental Protocols

A rhodium-catalyzed cascade C-H activation/annulation strategy for the expedited assembly of pyrrolidinedione-fused 1,2-benzothiazines

By: Wu, Yinsong; et al

Organic & Biomolecular Chemistry (2024), 22(17), 3523-3532.

31-614-CAS-35770115	Steps: 1	Rh(III)-Catalyzed [4+1] Annulation of Sulfoximines with Maleimides: Access to Benzoisothiazole Spiropyrrolidin ediones By: Liu, Liansheng; et al Journal of Organic Chemistry (2023), 88(6), 3626-3635.
1.1 Reagents: Acetic acid, Nitrobenzene, Copper diacetate monohydrate, 2,2,2-Trifluoroethanol- <i>d</i> Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)] rhodium], Silver hexafluoroantimonate; 1 h, 90 °C; 90 °C → rt 1.2 Reagents: Water; rt		
Experimental Protocols		

31-116-CAS-22544985	Steps: 1	Sulfoximines-assisted Rh(III)-catalyzed C-H activation and intramolecular annulation for the synthesis of fused isochoromo-1,2-benzothiazines scaffolds under room temperature By: Wang, Bao; et al Molecules (2020), 25(11), 2515.
1.1 Reagents: Propanoic acid, 2,2-dimethyl-, silver(1+) salt (1:1), 2,2-Trifluoroethan-1,1- <i>d</i> ₂ -ol- <i>d</i> Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)] rhodium] Solvents: 2,2,2-Trifluoroethan-1,1- <i>d</i> ₂ -ol- <i>d</i> ; 18 h, rt		
Experimental Protocols		

Scheme 317 (1 Reaction)	Steps: 1

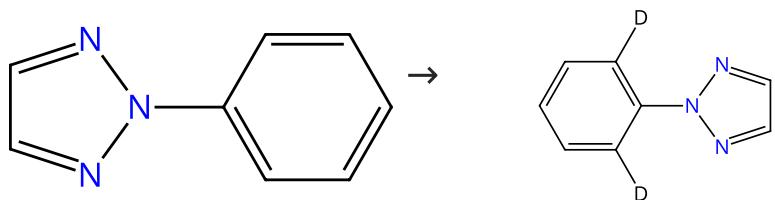
31-116-CAS-23730490	Steps: 1	Selective Synthesis of 5-Alkylated and 5-Alkenylated Chromones via Catalytic C-H Coupling of Chromones with Allyl Alcohols By: Du, Ya-Zhen; et al European Journal of Organic Chemistry (2021), 2021(17), 2411-2420.
1.1 Reagents: Silver acetate, Methanol- <i>d</i> ₄ Catalysts: Silver triflate, Bis[dichloro[η ⁵ -(pentamethylcycloptadienyl)]rhodium] Solvents: 1,2-Dichloroethane; 6 h, 60 °C Experimental Protocols		

Scheme 318 (1 Reaction)	Steps: 1

31-614-CAS-34877742	Steps: 1	Experimental and computational studies on rhodium-catalyzed C4(5)aryl-H activation/annulation of imidazoles with alkynes: facile synthesis of six types of N-heterocycles By: Tian, Ya-Nan; et al Organic Chemistry Frontiers (2023), 10(1), 83-91.
1.1 Reagents: Methanol- <i>d</i> ₄ , Copper(II) triflate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)] rhodium] Solvents: Methanol; 1 h, 100 °C Experimental Protocols		

Scheme 319 (1 Reaction)

Steps: 1



Suppliers (48)

31-116-CAS-19979795

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate, 1-Butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide; 4 h, 80 °C

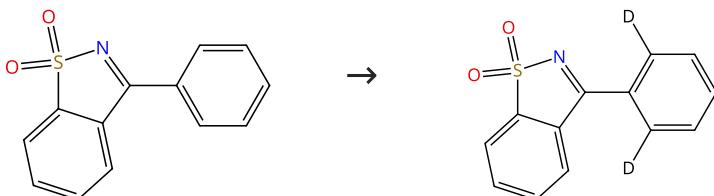
Temperature-Controlled Mono- and Diolefination of Arene Using Rh(III)/RTIL as an Efficient and Recyclable Catalytic System

By: Yao, Tian; et al

ACS Sustainable Chemistry & Engineering (2019), 7(6), 6068-6077.

Scheme 320 (1 Reaction)

Steps: 1



Suppliers (30)

31-116-CAS-21446062

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*OC-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: 2-Methyl-2-butanol; 18 h, 100 °C

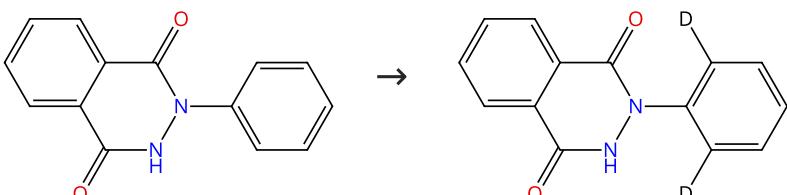
The regioselective annulation of alkylidenecyclopropanes by Rh(III)-catalyzed C-H/C-C activation to access spirocyclic benzosultams

By: Li, Qiuyun; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(12), 1835-1838.

Scheme 321 (1 Reaction)

Steps: 1



Suppliers (38)

31-614-CAS-41965073

Steps: 1

1.1 Reagents: Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*OC-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: 1,2-Dimethoxyethane; 0.5 h, 130 °C

Rh(III)- or Ru(II)-Catalyzed C-H Annulation with Vinylene Carbonate and an Unexpected Aerobic Oxidation/Deprotection Cascade to Yield Cinnolin-4(1H)-ones

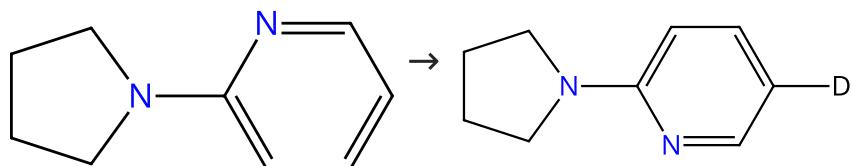
By: Wang, Yuqin; et al

Journal of Organic Chemistry (2024), 89(19), 14233-14241.

Experimental Protocols

Scheme 322 (1 Reaction)

Steps: 1



Suppliers (46)

31-614-CAS-38101237

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: Rhodium, bis[μ-[a,a,a',a'-tetramethyl-1,3-benzenedipropanoato(2-)·κO¹,κO³:κO²,κO¹]]di-, (*Rh-Rh*); rt; 24 h, 100 °C

Experimental Protocols

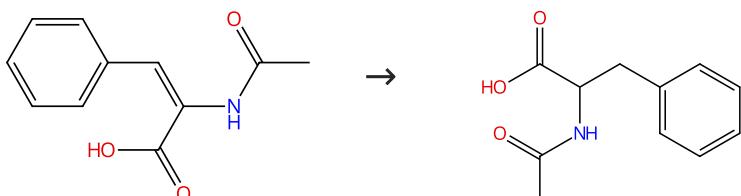
Rh(II)-catalyzed intermolecular carboamination of pyridines via double Csp²-H bond activations

By: Luo, Zhongfeng; et al

Science China: Chemistry (2024), 67(1), 374-382.

Scheme 323 (1 Reaction)

Steps: 1



Suppliers (64)

Suppliers (76)

31-244-CAS-5707764

Steps: 1

1.1 Reagents: Hydrogen

Catalysts: Rhodium(1+), bis[(1,2,5,6-η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), 1,1'-[[[(4S,5S)-2,2-Dimethyl-1,3-dioxolane-4,5-diyl]bis(methylene)]bis[1,1-diphenylphosphine]]

Solvents: Methanol-*d*; 15 s, rt

Experimental Protocols

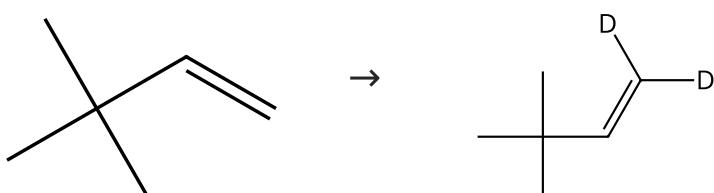
Hyperpolarization of amino acid precursors to neurotransmitters with parahydrogen induced polarization

By: Soon, Pei Che; et al

Chemical Communications (Cambridge, United Kingdom) (2013), 49(46), 5304-5306.

Scheme 324 (1 Reaction)

Steps: 1



Suppliers (51)

31-116-CAS-12188505

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato-κN¹,κO⁸)rhodiumSolvents: Methanol-*d*; 22 h, 50 °C

Experimental Protocols

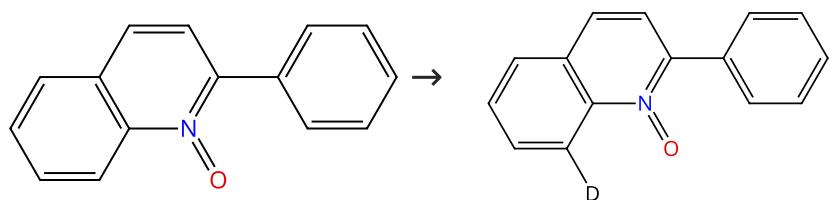
Mild and Selective H/D Exchange at the β Position of Aromatic α-Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 325 (1 Reaction)

Steps: 1


 Suppliers (4)

31-116-CAS-19185644

Steps: 1

- 1.1 **Reagents:** Acetic acid, Methanol-*d*₄
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Toluene; 5 h, 90 °C

Rh(III)-Catalyzed C(8)-H Functionalization of Quinolines via Simultaneous C-C and C-O Bond Formation: Direct Synthesis of Quinoline Derivatives with Antiplasmodial Potential

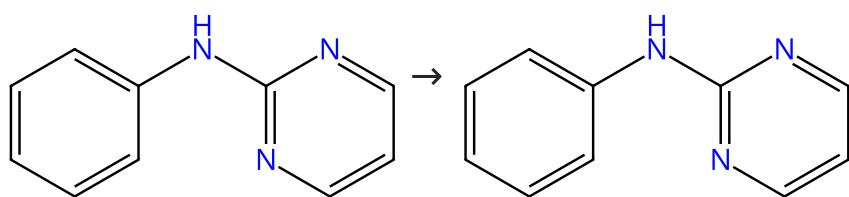
By: Sharma, Ritika; et al

Journal of Organic Chemistry (2018), 83(20), 12702-12710.

Experimental Protocols

Scheme 326 (1 Reaction)

Steps: 1


 Suppliers (63)

31-614-CAS-27949369

Steps: 1

- 1.1 **Reagents:** Acetic acid-*d*
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: Methanol-*d*; 12 h, 80 °C

Rhodium(III)-Catalyzed Synthesis of Indole Derivatives From Pyrimidyl-Substituted Anilines and Diazo Compounds

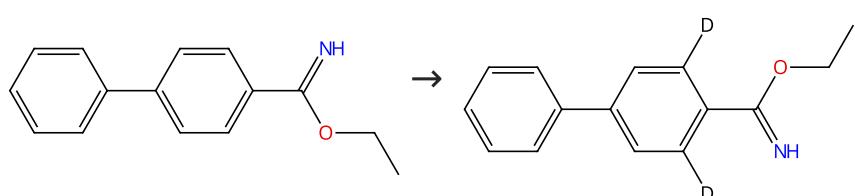
By: Yu, Ke; et al

Advanced Synthesis & Catalysis (2016), 358(4), 661-666.

Experimental Protocols

Scheme 327 (1 Reaction)

Steps: 1


 Suppliers (7)

31-614-CAS-34859075

Steps: 1

- 1.1 **Reagents:** 2,2,2-Trifluoroethan-1,1-*d*₂-ol-*d*
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 12 h, 120 °C

Synthesis of naphthalene-substituted aromatic esters via Rh(II)-catalyzed C-H bond naphthylation and cascade directing group transformation

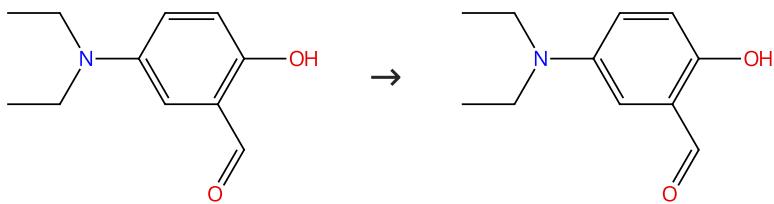
By: Cui, Yue; et al

Chemical Communications (Cambridge, United Kingdom) (2022), 58(95), 13230-13233.

Experimental Protocols

Scheme 328 (1 Reaction)

Steps: 1


 Suppliers (36)

31-614-CAS-27376160

Steps: 1

- 1.1 **Reagents:** Cesium acetate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane, Methanol-*d*₄; 60 min, 80 °C

Experimental Protocols

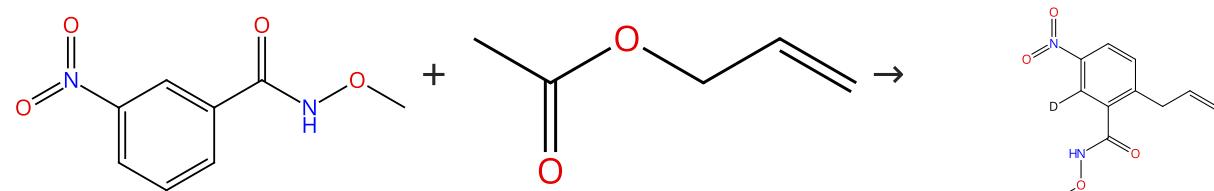
Harnessing Stereospecific Z-Enamides through Silver-Free Cp*Rh(III) Catalysis by Using Isoxazoles as Masked Electrophiles

By: Debbarma, Suvankar; et al

Organic Letters (2019), 21(3), 835-839.

Scheme 329 (1 Reaction)

Steps: 1


 Suppliers (4)
 Suppliers (50)

31-085-CAS-15767370

Steps: 1

- 1.1 **Reagents:** Silver carbonate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*; 12 h, 80 °C

Experimental Protocols

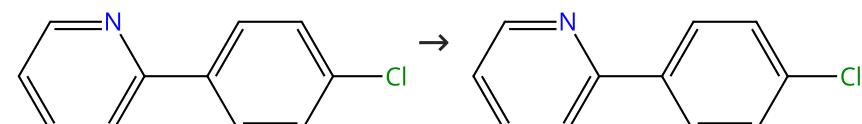
Solvent-Controlled, Tunable β-OAc and β-H Elimination in Rh(I)-Catalyzed Allyl Acetate and Aryl Amide Coupling via C–H Activation

By: Dai, Huimin; et al

Organic Letters (2016), 18(14), 3410-3413.

Scheme 330 (1 Reaction)

Steps: 1


 Suppliers (68)

31-614-CAS-35155681

Steps: 1

- 1.1 **Reagents:** Zinc acetate, Methanol-*d*₄, Water-*d*₂, Lithium perchlorate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: 2,2,2-Trifluoroethanol; 20 min, 130 °C

Experimental Protocols

N-Allylbenzimidazole as a strategic surrogate in Rh-catalyzed stereoselective trans-propenylation of aryl C(sp²)-H bond

By: Biswal, Pragati; et al

Chemical Communications (Cambridge, United Kingdom) (2023), 59(2), 199-202.

Scheme 331 (1 Reaction)

Steps: 1



Suppliers (60)

31-116-CAS-7652679

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato- $\kappa^{\text{N}^1,\text{O}^3}$)rhodiumSolvents: Methanol-*d*; 4 h, 25 °C

Experimental Protocols

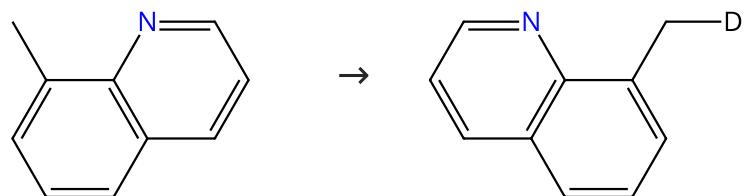
Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 332 (1 Reaction)

Steps: 1



Suppliers (69)

Supplier (1)

31-116-CAS-15993019

Steps: 1

1.1 Reagents: Pivalic acid, Methanol-*d*₄Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 3 h, 80 °C

Experimental Protocols

Rh-Catalyzed Direct Amination of Unactivated C(sp³)-H bond with Anthranils Under Mild Conditions

By: Tang, Conghui; et al

Chemistry - A European Journal (2016), 22(32), 11165-11169.

Scheme 333 (4 Reactions)

Steps: 1



Suppliers (69)

Supplier (1)

31-116-CAS-19684830

Steps: 1

1.1 Reagents: Acetic acid-*d*₄, Methanol-*d*₄Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 24 h, 70 °C

Experimental Protocols

Cp^{*}Co^{III}-Catalyzed Alkylation of Primary and Secondary C(sp³)-H Bonds of 8-Alkylquinolines with Maleimides

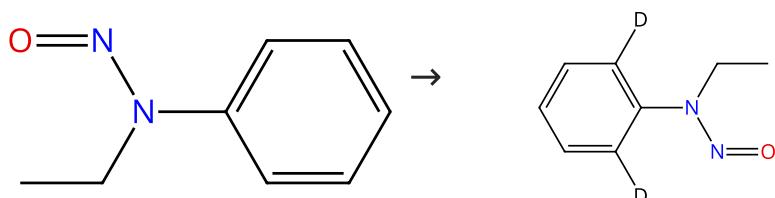
By: Kumar, Rakesh; et al

Journal of Organic Chemistry (2019), 84(3), 1542-1552.

31-116-CAS-19349656	Steps: 1	Palladium-Catalyzed Direct α -Ketoesterification of 8-Methylquinoline Derivatives with α -Ketoacids via Dehydrogenation Coupling Reaction By: Li, Lesong; et al Organic Letters (2018), 20(22), 7321-7325.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Pivalic acid, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver Solvents: Toluene, Chlorobenzene; 24 h, 90 °C	Experimental Protocols	
31-116-CAS-17395188	Steps: 1	Rhodium(III)-Catalyzed Acylation of C(sp ³)-H bonds with Cyclopropenones By: Kong, Lingheng; et al Organic Letters (2017), 19(13), 3644-3647.
1.1 Reagents: Methanol- <i>d</i> ₄ Catalysts: Pivalic acid, Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl]-κO]methanesulfonamidato-κO]silver Solvents: Toluene, Chlorobenzene; 24 h, 90 °C	Experimental Protocols	
31-116-CAS-16095938	Steps: 1	Rhodium(III)-Catalyzed C(sp ³)-H Alkylation of 8-Methylquinolines with Maleimides By: Han, Sangil; et al Organic Letters (2016), 18(18), 4666-4669.
1.1 Reagents: Acetic acid- <i>d</i> , Methanol- <i>d</i> ₄ Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: 1,2-Dichloroethane; rt; 24 h, 70 °C	Experimental Protocols	

Scheme 334 (1 Reaction)

Steps: 1

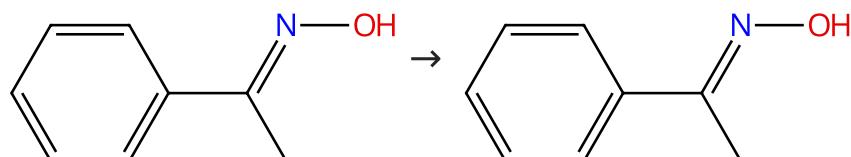


Suppliers (45)

31-116-CAS-6590539	Steps: 1	Rhodium(III)-Catalyzed N-Nitroso-Directed C-H Olefination of Arenes. High-Yield, Versatile Coupling under Mild Conditions By: Liu, Baoqing; et al Journal of the American Chemical Society (2013), 135(1), 468-473.
1.1 Reagents: Silver acetate Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate Solvents: Methanol- <i>d</i> ₄ , Water- <i>d</i> ₂ ; 14 h, 30 °C	Experimental Protocols	

Scheme 335 (1 Reaction)

Steps: 1



Suppliers (59)

31-614-CAS-30453236

Steps: 1

Rhodium-Catalyzed C-H Activation/Annulation Cascade of Aryl Oximes and Propargyl Alcohols to Isoquinoline N-Oxides

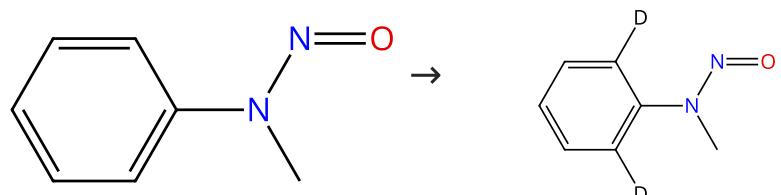
By: Li, Yuan; et al

Advanced Synthesis & Catalysis (2021), 363(13), 3305-3310.

Experimental Protocols

Scheme 336 (3 Reactions)

Steps: 1



Suppliers (75)

31-614-CAS-40037648

Steps: 1

Expedited Synthesis of Spiroindoline Derivatives via Tandem C(sp²)-H and C(sp³)-H Bond Functionalization of N-Methyl-N-nitrosoanilines

By: Wang, Kelin; et al

Organic Letters (2024), 26(15), 3091-3096.

1.1 Reagents: Cupric acetate, Methanol-d₄, Tempo, Oxygen

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)] rhodium]

Solvents: 1,1,1,3,3,3-Hexafluoro-2-propanol; 10 min, 80 °C; 80 °C → rt

1.2 Reagents: Sodium chloride

Solvents: Water

Experimental Protocols

31-614-CAS-36845906

Steps: 1

Rapid Access to Polysubstituted Tetrahydrocarbazol-4-ones via Sequential Selective C-H Functionalization from N-Nitrosoanilines

By: Li, Chan; et al

Chinese Journal of Chemistry (2023), 41(16), 1957-1962.

Experimental Protocols

31-116-CAS-19206312

Steps: 1

Rhodium-catalyzed oxidative C-H/C-H cross-coupling of aniline with heteroarene: N-nitroso group enabled mild conditions

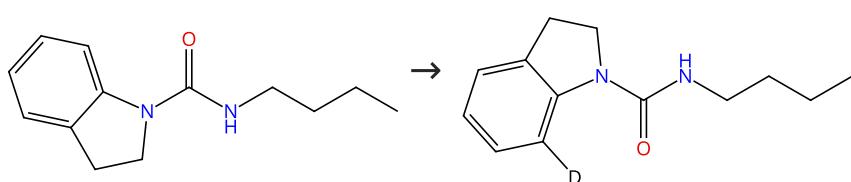
By: He, Shuang; et al

Chemical Communications (Cambridge, United Kingdom) (2018), 54(56), 7794-7797.

Experimental Protocols

Scheme 337 (1 Reaction)

Steps: 1



Suppliers (4)

31-116-CAS-917438

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Tetrahydrofuran; 20 h, rt

Experimental Protocols

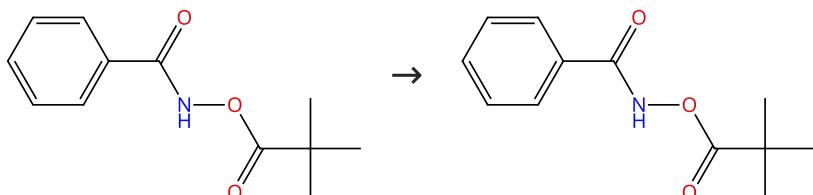
Mild Rh(III)-Catalyzed C7-Allylation of Indolines with Allylic Carbonates

By: Park, Jihye; et al

Journal of Organic Chemistry (2015), 80(3), 1818-1827.

Scheme 338 (2 Reactions)

Steps: 1



Suppliers (14)

31-614-CAS-36027527

Steps: 1

1.1 Reagents: Propanoic acid, 2,2-dimethyl-, potassium salt (1:1), 2,2,2-Trifluoroethan-1,1-*d*₂-ol-*d*
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 0.5 h, rt

Experimental Protocols

Regiocontrolled Rh(III)-catalyzed C-C coupling/C-N cyclization mediated by distinctive 1,2-migratory insertion of gem-difluoromethylene allenes: Reaction development and mechanistic insight

By: Zhou, Zhi; et al

Chinese Chemical Letters (2023), 34(5), 107849.

31-614-CAS-25424070

Steps: 1

1.1 Reagents: Methanol-*d*₄
Catalysts: Propanoic acid, 2,2-dimethyl-, cesium salt (1:1), Rhodium, di-*μ*-chlorodichlorobis[(1,2,3,3a,7a-η)-1,2,3,4,5,6,7-heptamethyl-1*H*-inden-1-*y*]di-, stereoisomer; 24 h, rt

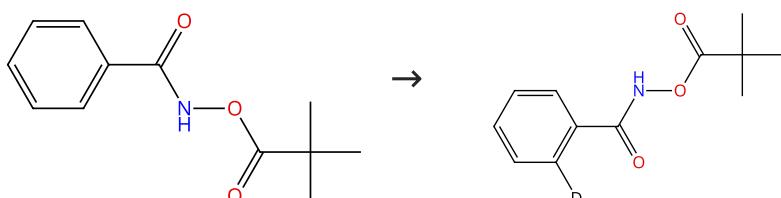
Heptamethylindenyl (Ind*) enables diastereoselective benzamidation of cyclopropenes via Rh(III)-catalyzed C-H activation

By: Semakul, Natthawat; et al

Chemical Science (2017), 8(2), 1015-1020.

Scheme 339 (1 Reaction)

Steps: 1



Suppliers (14)

31-614-CAS-34285728

Steps: 1

1.1 Reagents: Sodium carbonate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Ethanol; 1 h, rt

Experimental Protocols

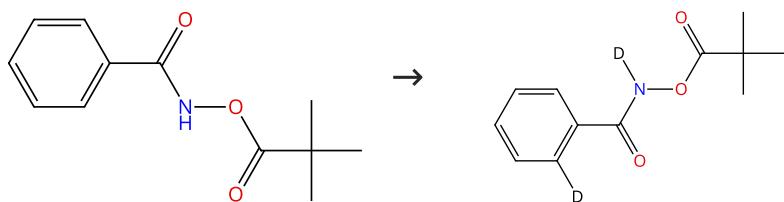
Recyclable rhodium-catalyzed C-H activation/[4 + 2] annulation with unconventional regioselectivity at ambient temperature: experimental development and mechanistic insight

By: Meng, Haifang; et al

Green Chemistry (2022), 24(18), 7012-7021.

Scheme 340 (1 Reaction)

Steps: 1



Suppliers (14)

31-116-CAS-18697418

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄, Oxygen, Propanoic acid, 2,2-dimethyl-, cesium salt (1:1)
Catalysts: Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-5-[2-(dimethylamino)-2-oxoethyl]-4,6-diphenyl-1*H*-cyclopenta[*c*]furan-3a(3*H*)-yl]dirhodium; 16 h, rt

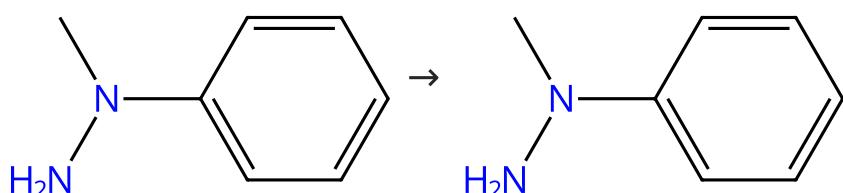
Formal Lossen Rearrangement/[3+2] Annulation Cascade Catalyzed by a Modified Cyclopentadienyl Rh^{III} Complex

By: Yamada, Takayuki; et al

Chemistry - A European Journal (2018), 24(22), 5723-5727.

Scheme 341 (1 Reaction)

Steps: 1



Suppliers (73)

31-614-CAS-30794509

Steps: 1

- 1.1 **Reagents:** Acetic acid
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 6 h, rt

A Versatile, Traceless C-H Activation-Based Approach for the Synthesis of Heterocycles

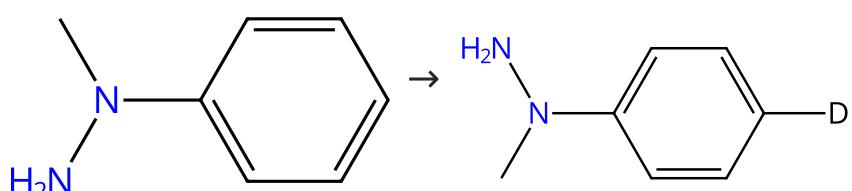
By: Zhou, Shuguang; et al

Organic Letters (2016), 18(10), 2427-2430.

Experimental Protocols

Scheme 342 (1 Reaction)

Steps: 1



Suppliers (73)

31-614-CAS-25570141

Steps: 1

- 1.1 **Catalysts:** Lithium acetate, Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 8 h, rt

Access to the Cinnoline Scaffold via Rhodium-Catalyzed Intermolecular Cyclization under Mild Conditions

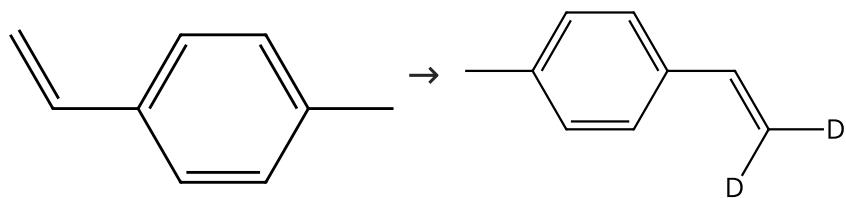
By: Song, Chao; et al

Organic Letters (2016), 18(18), 4510-4513.

Experimental Protocols

Scheme 343 (1 Reaction)

Steps: 1



Suppliers (70)

Supplier (1)

31-116-CAS-11919373

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ^N , κ^O)rhodiumSolvents: Methanol-*d*; 1 h, 25 °C

Experimental Protocols

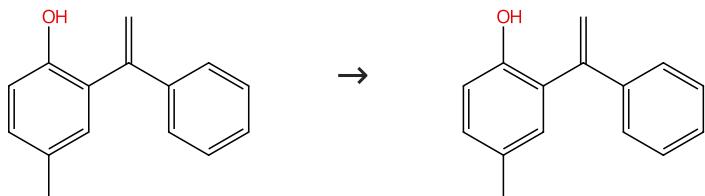
Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 344 (1 Reaction)

Steps: 1



Suppliers (9)

31-614-CAS-43379839

Steps: 1

1.1 Reagents: Methanol-*d*₄, Cesium acetateCatalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]; 24 h, 40 °C

Experimental Protocols

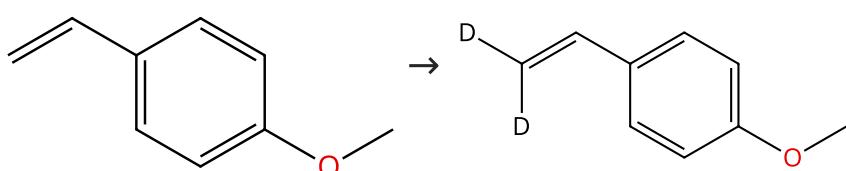
Chemo-/Regioselective [5+1] Annulation with gem-Difluoromethylene Allenes for the Assembly of Fluorinated 2*H*-Chromenes and Dihydroquinolines

By: Lin, Zhensheng; et al

Advanced Synthesis & Catalysis (2025), 367(3), e202401110.

Scheme 345 (1 Reaction)

Steps: 1



Suppliers (88)

31-116-CAS-7937636

Steps: 1

1.1 Reagents: Methanol-*d*Catalysts: (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ^N , κ^O)rhodiumSolvents: Methanol-*d*; 0.1 h, 25 °C

Experimental Protocols

Mild and Selective H/D Exchange at the β Position of Aromatic α -Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts

By: Di Giuseppe, Andrea; et al

Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.

Scheme 346 (1 Reaction)

Steps: 1



Suppliers (55)

31-614-CAS-34877724

Steps: 1

1.1 Reagents: Ammonium acetate, Methanol-*d*₄, Copper(II) triflate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Tetrahydrofuran; 0.5 h, 120 °C

Experimental and computational studies on rhodium-catalyzed C4(5)aryl-H activation/annulation of imidazoles with alkynes: facile synthesis of six types of N-heterocycles

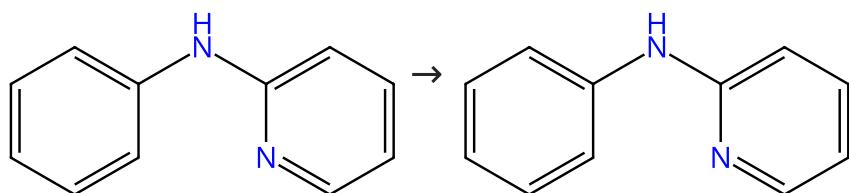
By: Tian, Ya-Nan; et al

Organic Chemistry Frontiers (2023), 10(1), 83-91.

Experimental Protocols

Scheme 347 (1 Reaction)

Steps: 1



Suppliers (73)

31-614-CAS-28077967

Steps: 1

1.1 Reagents: Silver acetate, Methanol-*d*₄
Catalysts: Tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium(2+)
Solvents: 2-Methyl-2-butanol; 18 h, 50 °C

Rh(III)-Catalyzed Carboamination of Propargyl Cycloalkanols with Arylamines via Csp²-H/Csp³-Csp³ Activation

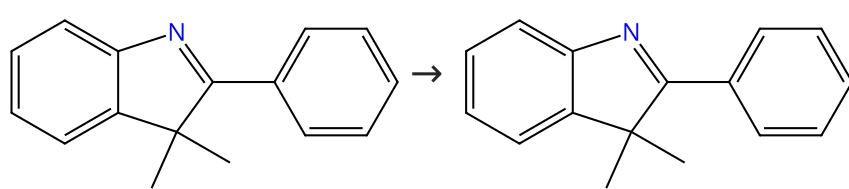
By: Hu, Xinwei; et al

Organic Letters (2017), 19(13), 3474-3477.

Experimental Protocols

Scheme 348 (1 Reaction)

Steps: 1



Suppliers (9)

31-614-CAS-36422973

Steps: 1

1.1 Reagents: 2,4,6-Trimethylbenzoic acid, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver tetrafluoroborate
Solvents: Ethanol; 8 h, rt

Rh(III)-Catalyzed Successive C-H Activations of 2-Phenyl-3H-indoles and Cyclization Cascades to Construct Highly Fused Indole Heteropolycycles

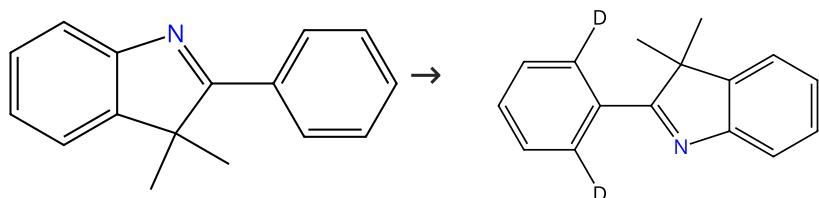
By: Gao, Ju; et al

Organic Letters (2023), 25(19), 3341-3346.

Experimental Protocols

Scheme 349 (2 Reactions)

Steps: 1



Suppliers (9)

31-614-CAS-41355793

Steps: 1

- 1.1 **Reagents:** 2,4,6-Trimethylbenzoic acid, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Ethanol; 0.5 h, rt
- 1.2 **Reagents:** Sodium bicarbonate
Solvents: Water

Experimental Protocols

Synthesis of branched and linear aryl allylic alcohols: C-H bond allylation of 2-aryl-3H-indoles with vinyl cyclic carbonates

By: Yu, Fan; et al

Tetrahedron Letters (2024), 147, 155225.

31-614-CAS-38397889

Steps: 1

- 1.1 **Reagents:** Acetic acid, Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 24 h, 80 °C

Experimental Protocols

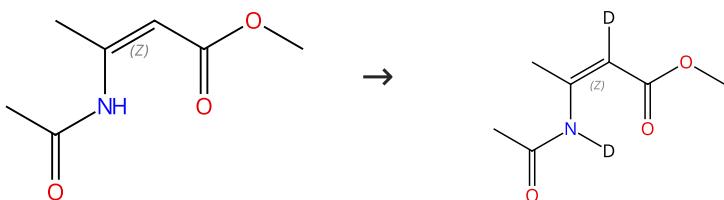
Rh(III)-Catalyzed Cascade Cyclization of 2-Aryl-3H-indoles and CF₃-Imidoyl Sulfoxonium Ylides Toward Trifluoroacetimidoyl-Substituted 11H-Isoindolo[2,1-a]indoless

By: Yang, Zuguang; et al

Advanced Synthesis & Catalysis (2023), 365(22), 3855-3860.

Scheme 350 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

Suppliers (11)

31-116-CAS-2843263

Steps: 1

- 1.1 **Catalysts:** Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 16 h, 70 °C

Experimental Protocols

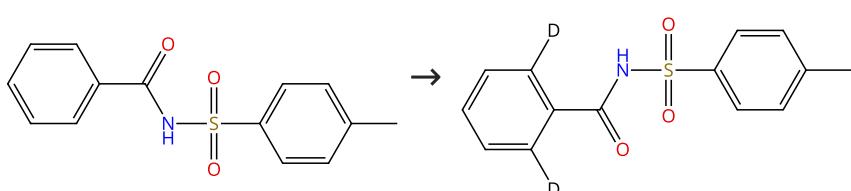
Pyrrole Synthesis via Allylic sp³ C-H Activation of Enamines Followed by Intermolecular Coupling with Unactivated Alkynes

By: Rakshit, Souvik; et al

Journal of the American Chemical Society (2010), 132(28), 9585-9587.

Scheme 351 (1 Reaction)

Steps: 1



Suppliers (50)

31-614-CAS-35032648

Steps: 1

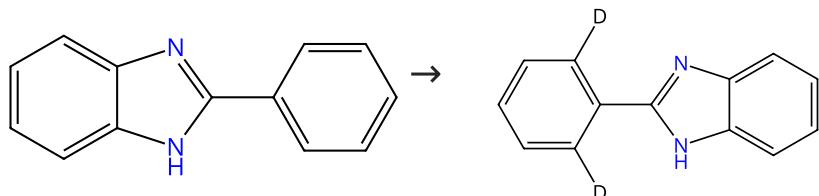
- 1.1 Reagents:** Lithium hydroxide
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol- d_4 ; 6 h, 120 °C

Experimental Protocols

Rh(III)-Catalyzed Defluorinative [4 + 2] Annulation of N-Sulfonylarylamides with Ethyl 2-Diazo-3,3-trifluoropropanoate: Synthesis of 1,3,4-Functionalized Isoquinolines
 By: Li, Haosheng; et al
Organic Letters (2022), 24(49), 8969-8974.

Scheme 352 (2 Reactions)

Steps: 1



Suppliers (78)

31-614-CAS-37155781

Steps: 1

- 1.1 Reagents:** Acetic acid, Zinc acetate, Methanol- d_4
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Toluene; 10 h, 100 °C

Experimental Protocols

Rapid Synthesis of Benzimidazole-Fused Isoindoles by Rh(III)/Ru(II)-Catalyzed [4 + 1] Cascade C-H/N-H Annulation of 2-Arylbenzimidazoles with Alkynoates and Alkynamide
 By: Huang, Ying-Ti; et al
Journal of Organic Chemistry (2023), 88(15), 10916-10924.

31-614-CAS-33818863

Steps: 1

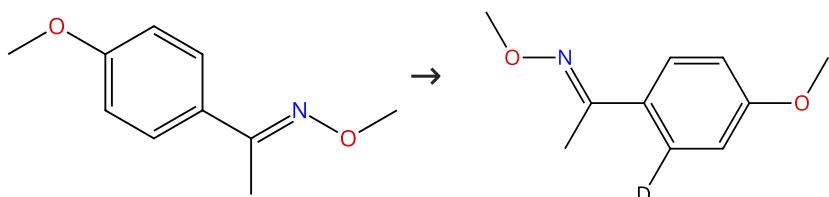
- 1.1 Reagents:** Silver acetate, Methanol- d_4
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 1 h, 100 °C

Experimental Protocols

Substrate-controlled Rh(III)-catalyzed regiodivergent annulation towards fused and spiro benzimidazoles
 By: Huang, Ying-Ti; et al
Organic & Biomolecular Chemistry (2022), 20(34), 6854-6862.

Scheme 353 (1 Reaction)

Steps: 1



Suppliers (2)

31-116-CAS-18330343

Steps: 1

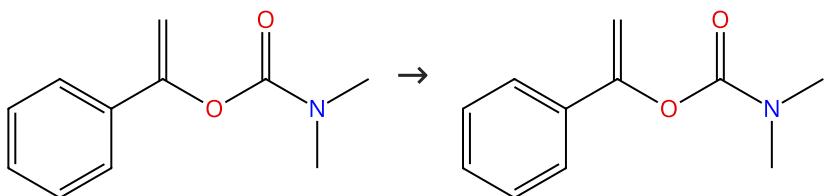
- 1.1 Reagents:** Silver acetate
Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol- d_4 ; 12 h, rt

Experimental Protocols

Catalyst-Controlled [3 + 2] and [4 + 2] Annulations of Oximes with Propargyl Alcohols: Divergent Access to Indenamines and Isoquinolines
 By: Gong, Wanchun; et al
Organic Letters (2018), 20(1), 182-185.

Scheme 354 (1 Reaction)

Steps: 1



Suppliers (2)

31-614-CAS-29105155

Steps: 1

1.1 Reagents: Cupric acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: Methanol-*d*₄; 16 h, 60 °C**Using Rh(III)-Catalyzed C-H Activation as a Tool for the Selective Functionalization of Ketone-Containing Molecules**

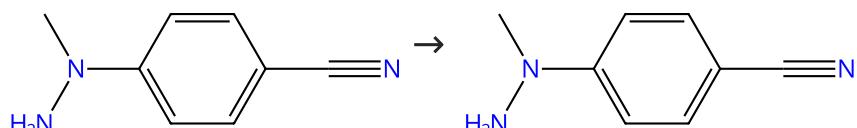
By: Boultadakis-Arapinis, Melissa; et al

Organic Letters (2014), 16(6), 1630-1633.

Experimental Protocols

Scheme 355 (1 Reaction)

Steps: 1



Suppliers (5)

31-614-CAS-25723037

Steps: 1

1.1 Reagents: Acetic acid

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: Methanol-*d*₄; 12 h, rt**A Versatile, Traceless C-H Activation-Based Approach for the Synthesis of Heterocycles**

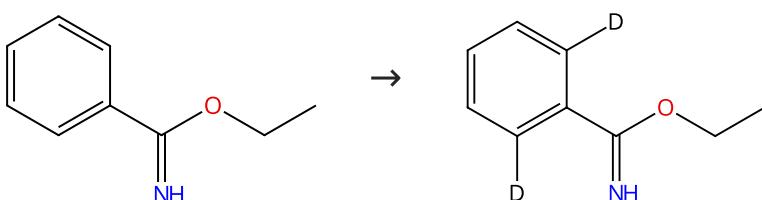
By: Zhou, Shuguang; et al

Organic Letters (2016), 18(10), 2427-2430.

Experimental Protocols

Scheme 356 (3 Reactions)

Steps: 1



Suppliers (20)

31-614-CAS-35060103

Steps: 1

1.1 Reagents: Methanol-*d*₄, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 2,2,2-Trifluoroethanol; 24 h, 100 °C

Rh(III)-Catalyzed Dual C-H Activation/Cascade Annulation of Benzimidates and CF₃-Imidoyl Sulfoxonium Ylides for the Synthesis of Trifluoromethyl-Decorated Benzo[de][1,8]naphthyridines

By: Zhang, Yu; et al

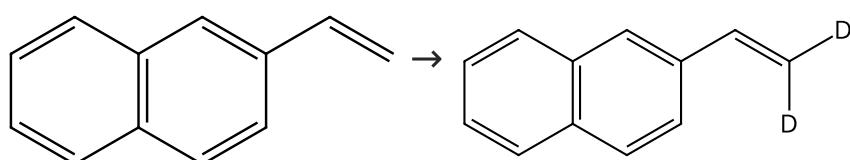
Organic Letters (2022), 24(48), 8864-8869.

Experimental Protocols

31-614-CAS-33725930	Steps: 1	Cp*Rh^{III}-Catalyzed Cascade Annulation of Arylimides with Pyridotriazoles toward Isoquinolin-3-ol Derivatives By: Yan, Weidan; et al Journal of Organic Chemistry (2022), 87(16), 10858-10868.
1.1 Reagents: Sodium acetate, Methanol- <i>d</i> ₄ , 1-Adamantane carboxylic acid Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl-κO]methanesulfonamido-κO]silver Solvents: Toluene; 3 h, 120 °C	Steps: 1	Synthesis of Highly Fused Pyrano[2,3-<i>b</i>]pyridines via Rh(III)-Catalyzed C-H Activation and Intramolecular Cascade Annulation under Room Temperature By: Han, Xu; et al Journal of Organic Chemistry (2020), 85(10), 6281-6294.

Scheme 357 (1 Reaction)

Steps: 1

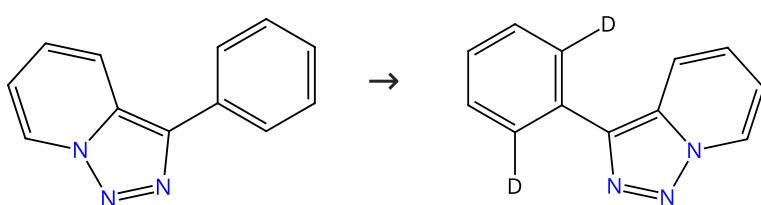


Suppliers (74)

31-116-CAS-5507930	Steps: 1	Mild and Selective H/D Exchange at the β Position of Aromatic α-Olefins by N-Heterocyclic Carbene-Hydride-Rhodium Catalysts By: Di Giuseppe, Andrea; et al Angewandte Chemie, International Edition (2011), 50(17), 3938-3942, S3938/1-S3938/25.
1.1 Reagents: Methanol- <i>d</i> Catalysts: (<i>SP</i> -5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2 <i>H</i> -imidazol-2-ylidene]chlorohydro(8-quinolinolato-κN ¹ ,κO ⁸)rhodium Solvents: Methanol- <i>d</i> ; 7 h, 25 °C	Steps: 1	Experimental Protocols

Scheme 358 (1 Reaction)

Steps: 1

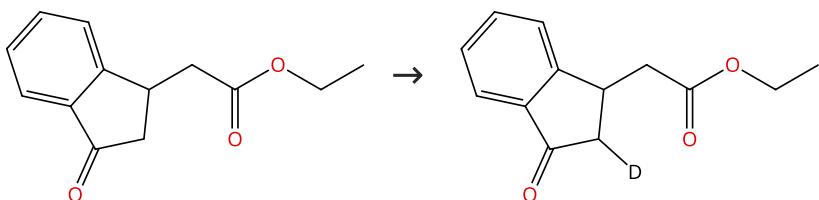


Suppliers (39)

31-614-CAS-38209331	Steps: 1	Access to Amides and Lactams via Pyridotriazole as a Transformable Directing Group By: Chen, Yuting; et al Journal of Organic Chemistry (2023), 88(22), 15597-15607.
1.1 Catalysts: Silver acetate, Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (<i>OC</i> -6-11)-hexafluoroantimonate(1-) (1:2) Solvents: Dichloromethane, Methanol- <i>d</i> ₄ ; 12 h, 100 °C	Steps: 1	Experimental Protocols

Scheme 359 (1 Reaction)

Steps: 1



Suppliers (3)

31-116-CAS-17908972

Steps: 1

1.1 Reagents: Cupric acetate, Ethanol-*d*₆, 1-Benzothiepin-5(2*H*)-one, 3,4-dihydro-, oxime

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 18 h, 120 °C

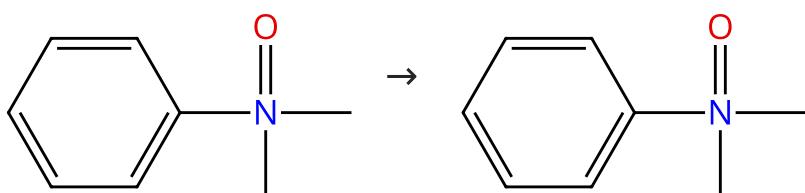
Rhodium(III)-catalyzed synthesis of indanones via C-H activation of phenacyl phosphoniums and coupling with olefins

By: Li, Yunyun; et al

Organic Chemistry Frontiers (2017), 4(11), 2114-2118.

Scheme 360 (1 Reaction)

Steps: 1



Suppliers (12)

31-614-CAS-26772878

Steps: 1

1.1 Reagents: Propanoic acid-*d*, 2,2-dimethyl-

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Methanol-*d*; 24 h, 60 °C

Rh(III)-catalyzed chemoselective C-H functionalizations of tertiary aniline N-oxides with alkynes

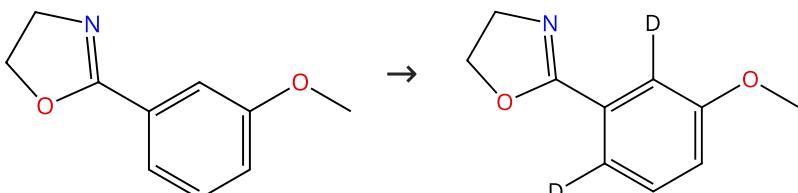
By: Huang, Xiaolei; et al

Chemical Communications (Cambridge, United Kingdom) (2016), 52(37), 6253-6256.

Experimental Protocols

Scheme 361 (1 Reaction)

Steps: 1



Suppliers (4)

31-116-CAS-16343366

Steps: 1

1.1 Reagents: Methanol-*d*₄, Iodobenzene diacetate, 2-Phenyl-2-oxazoline

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Dichloromethane; 1 h, 100 °C

Oxazoline-Promoted Rh-Catalyzed C-H Amidation of Benzene Derivatives with Sulfonamides and Trifluoroacetamide. A Comparative Study

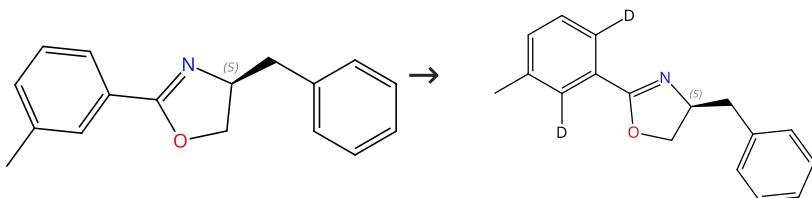
By: Maiden, Tracy M. M.; et al

Journal of Organic Chemistry (2016), 81(22), 10641-10650.

Experimental Protocols

Scheme 362 (1 Reaction)

Steps: 1



Absolute stereochemistry shown,
Rotation (+)

Absolute stereochemistry shown

Supplier (1)

31-116-CAS-7459249

Steps: 1

1.1 **Reagents:** Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 16 h, 70 °C; 70 °C → rt

Synthesis of olefin-oxazoline ligands (OlefOx) by rhodium(III)-catalyzed oxidative olefination

By: Schroeder, Nils; et al

Advanced Synthesis & Catalysis (2012), 354(4), 579-583.

Experimental Protocols

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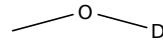
Task History

Initiating Search

February 21, 2025, 6:51 PM

Substances:

Filtered By:



Structure Match: Substructure

Search Tasks

Task	Search Type	View
Returned Substance Results + Filters (12,935)	Substances	View Results
Exported: Retrieved Related Reaction Results + Filters (934)	Reactions	View Results
Filtered By:		
Substance Role:	Reactant, Reagent, Solvent	
Catalyst:	<p>[(1,2,5,6-η)-1,5-Cyclooctadiene][N-[(4,6-dimethoxy-2,3-dimethyl-1H-indol-7-yl-κN)methylene]benzenaminato-κN]rhodium, [(3a,4,5,6,6a-η)-(13cR)-3,7-Dihydro-2,8-dimethoxy-3aH-cyclopenta[6,7]cycloocta[2,1-a:3,4-a']dinaphthalen-3a-yl]bis(η²-ethene)rhodium, (η⁵-2,4-Cyclopentadien-1-yl)[(2,3,5,6-η)-1,2,3,4,5,6-hexamethylbicyclo[2.2.0]hexa-2,5-diene]rhodium, Acetic acid, rhodium(2+) salt, Bis[(1,2,3,4,5-η)-1,3-bis(1,1-dimethyl ethyl)-2,4-cyclopentadien-1-yl]di-μ-chlorodichlorodirhodium(2+), Bis[(1,2,5,6-η)-1,5-cyclooctadiene]di-μ-hydroxydirhodium, Bis[(1,2,5,6-η)-1,5-cyclooctadiene]di-μ-methoxydirhodium, Bis(η²-ethene)(2,4-pentanediionato-κO,κO')rhodium, Bis(η²-ethene)[(8a,9,10,11,11a-η)-(2aS)-1,2,3,4-tetrahydro-7,13-dimethoxy-8H-cyclopenta[5,6]cyclonona[1,2,3-cd:1,9,8-c'd']diinden-8a(12H)-yl]rhodium, Bis(acetato-κO)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Bis[μ-(acetato-κO,κO')]bis[(1,2,5,6-η)-1,5-cyclooctadiene]dirhodium, Bis[μ-(acetato-κO,κO')]bis(acetato-κO)bis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]dirhodium, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Chloro[2-(1-methylhydrazinyl-κN²)phenyl-κC][(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Chloro[5-hydroxy-2-[1-[(4-methoxyphenyl)imino-κN]ethyl]phenyl-κC][(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Dicarbonyl[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, Dicarbonylrhodium acetylacetone, Di-μ-chlorobis[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-</p>	

yl]dirhodium, Di- μ -chlorobis[(1,2,5,6- η)-1,5-cyclooctadiene]dirhodium, Di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1,2,3,4-tetramethyl-5-(trifluoromethyl)-2,4-cyclopentadien-1-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13b*R*)-3,7-dihydro-2,8-dimethoxy-3a*H*-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(13b*R*)-3,7-dihydro-4,5,6-trimethyl-3a*H*-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-(3a*R*,13b*R*)-3,7-dihydro-2,8-bis(methylenemethyl)-3a*H*-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]dirhodium, Di- μ -chlorodichlorobis[(3a,4,5,6,6a- η)-5-[2-(dimethylamino)-2-oxoethyl]-4,6-diphenyl-1*H*-cyclopenta[c]furan-3a(3*H*)-yl]dirhodium, Di- μ -chlorodichlorobis(η^5 -2,4-cyclopentadien-1-yl)dirhodium, Di- μ -chlorotetrakis[(1,2- η)-cyclooctene]dirhodium, Di- μ -iododiiodobis[(11a,12,13,14,14a- η)-(6*S*)-4,5,6,7,11-pentahydro-1,10-dimethoxycyclopent[5,6]inden[7',1':8,9,1]cyclonon[1,2,3-*cd*]inden-11a-yl]dirhodium, Dirhodium tetraacetate, Hydro[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl][2-(2-pyridinyl- κ N)phenyl- κ C]rhodium, [N-[2-(Amino- κ N)phenyl]-4-methylbenzenesulfonamido- κ M][(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium, (OC-6-14)-Bis(acetato- κ O)aqua[2,6-bis[(4*S*)-4,5-dihydro-4-(1-methylethyl)-2-oxazolyl- κ B³]phenyl- κ C]rhodium, (OC-6-26)-(Acetonitrile)[1,3-bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κ N¹, κ O⁸)rhodium, Rhodium, Rhodium(1+), [1,1'-(1,4-butanediyl)bis[1,1-diphenylphosphine- κ P]]-[(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(1,2,5,6- η)-1,5-cyclooctadiene][(1*R*,1'*R*)-1,1'-(1,2-ethanediyl)bis[1-(2-methoxyphenyl)phenylphosphine- κ P]]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(1,2,5,6- η)-1,5-cyclooctadiene][(2*R*,2'*R*,5*R*,5'*R*)-1,1'-(1,2-phenylene)bis[2,5-dimethylphospholane- κ P]]-, perchlorate, Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,1'-(1,2-ethanediyl)bis[1,1-diphenylphosphine- κ P]]-, 1,1,1-trifluoromethanesulfonate (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,1'-(1,4-butanediyyl)bis[1,1-diphenylphosphine- κ P]]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,1'-(1*S*)-[1,1'-binaphthalene]-2,2'-diylbis[1,1-diphenylphosphine- κ P]]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][(11a*R*)-4,8-bis(1,1-dimethylethyl)-6-[2-(diphenylphosphino- κ P)phenoxy]-1,2,10,11-tetramethylidibenzo[d,f][1,3,2]dioxaphosphepin- κ P⁶]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][1,4-butanediyylbis[diphenylphosphine- κ P]]-, Rhodium(1+), [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][(2*S*,2'*S*,5*S*,5'*S*)-1,1'-(1,2-phenylene)bis[2,5-dimethylphospholane- κ P]]-, 1,1,1-trifluoromethanesulfonate (1:1), Rhodium(1+), [2-[[bis(1,1-dimethylethyl)phosphino- κ P]methyl]phenyl- κ C]hydrotris(2-propanone), (OC-6-24)-, tetrafluoroborate(1-), Rhodium(1+), [bis(1,1-dimethylethyl)][[(*S*)-(1,1-dimethylethyl)methylphosphino- κ P]methyl]phosphine- κ P][(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), bis[(1,2,5,6- η)-1,5-cyclooctadiene]-, 1,1,1-trifluoromethanesulfonate (1:1), Rhodium(1+), bis[(1,2,5,6- η)-1,5-cyclooctadiene]-, tetrafluoroborate(1-) (1:1), Rhodium(1+), bis[(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene][μ -[3,5-bis[(diphenylphosphino)methyl]-1*H*-pyrazolato- κ N¹, κ B⁵: κ N², κ P³]]di-, tetrafluoroborate(1-), Rhodium(1+), bis[(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene]-, tetrafluoroborate(1-) (1:1), Rhodium(2+), bis[[2-(diphenylphosphine- κ P)ethyl](η ⁶

phenyl)phenylphosphine- κP]di-, tetrafluoroborate(1-) (1:2), Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, hexafluorophosphate(1-) (1:2), Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:2), Rhodium, (acetato- κO)[5-fluoro-2-[methyl(nitroso- κN)amino]phenyl- κC][(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:1), Rhodium, acetyl[2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)-N²¹,N²²,N²³,N²⁴]-, (SP-5-31)-, Rhodium, bis[(3a,4,5,6,6a- η)-(13bR)-5-(1,1-dimethylethyl)-3,7-dihydro-2,8-dimethoxy-3aH-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]-di- μ -iododiiodododi-, Rhodium, bis[μ -[α , α , α' , α' -tetramethyl-1,3-benzenedipropanoato(2-)- κO^1 , κO^3 , κO^3 , κO^1]di-, (Rh-Rh), Rhodium, di- μ -chlorodichlorobis[(1,2,3,3a,7a- η)-1,2,3,4,5,6,7-heptamethyl-1H-inden-1-yl]di-, stereoisomer, Rhodium, di- μ -iododiiodobis[(11a,12,13,14,14a- η)-4,5,6,7,11-pentahydro-1,10-dimethoxy-2,4,4,7,7,9-hexamethylcyclopent[5,6]indenol[7',1':8,9,1]cyclonon[1,2,3- α]inden-11a-yl]di-, stereoisomer, Rhodium, di- μ -iododiiodobis[(3a,4,5,6,6a- η)-(13bR)-4,5,6-trimethyl-3aH-cyclopenta[b]dinaphtho[2,1- ϵ :1'2'-g][1,4]dioxocin-3a-yl]di-, Rhodium sulfide, Rhodium, tetracarbonyldi- μ -chlorodi-, Rhodium, tetrakis[μ -(hexahydro-2H-azepin-2-onato- κN^1 : κO^2)]di-, (Rh-Rh), Rhodium, tetrakis[μ -(octanoato- κO : κO)]di-, (Rh-Rh), Rhodium trichloride, Rhodium trichloride hydrate, Rhodium trichloride trihydrate, (SP-4-2)-Bis(methan- d_3 -ol- d)[(1S,1'S)-1,1'-(1,2-phenylene)bis[1-(1,1-dimethylethyl)-1-methylphosphine- κP]]rhodium(1+), (SP-4-2)-Chlorotris(triphenylphosphine)rhodium, (SP-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2H-imidazol-2-ylidene]chlorohydro(2-methyl-8-quinolinolato- κN^1 , κO^3)rhodium, (SP-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2H-imidazol-2-ylidene]chlorohydro(8-quinolinolato- κN^1 , κO^3)rhodium, Stereoisomer of bis[(3a,4,5,6,6a- η)-(13bR)-3,7-dihydro-2,8-bis[[tris(1-methylethyl)silyl]oxy]-3aH-cyclopenta[6,7]cycloocta[2,1- α :3,4- α']dinaphthalen-3a-yl]di- μ -iododiiododirhodium, Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,3a,7a- η)-4,5,6,7-tetrahydro-1,3-diphenyl-1H-inden-1-yl]dirhodium, Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]dirhodium, Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1-cyclohexyl-2,3,4,5-tetramethyl-2,4-cyclopentadien-1-yl]dirhodium, Triaquuntrichlororhodium

Document

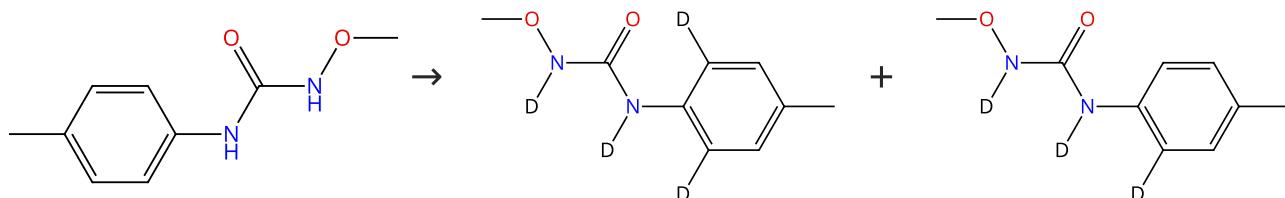
Journal

Type:

Language: English



Reactions (63)

[View in CAS SciFinder](#)
Scheme 1 (1 Reaction)

[Suppliers \(4\)](#)
31-116-CAS-9577033

Steps: 1 Yield: 89%

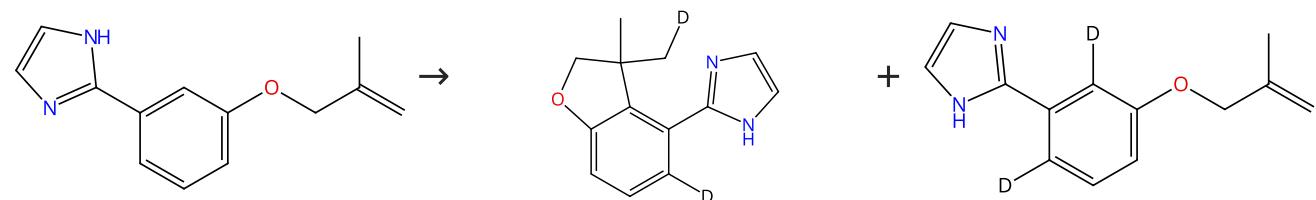
1.1 Reagents: Sodium acetate, *tert*-Butyl alcohol-*d*
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 16 h, 70 °C

[Experimental Protocols](#)

Investigating N-methoxy-N'-aryl ureas in oxidative C-H olefination reactions: an unexpected oxidation behavior

By: Willwacher, Jens; et al

Organic & Biomolecular Chemistry (2011), 9(13), 4736-4740.

Scheme 2 (1 Reaction)

31-614-CAS-36906791

Steps: 1 Yield: 80%

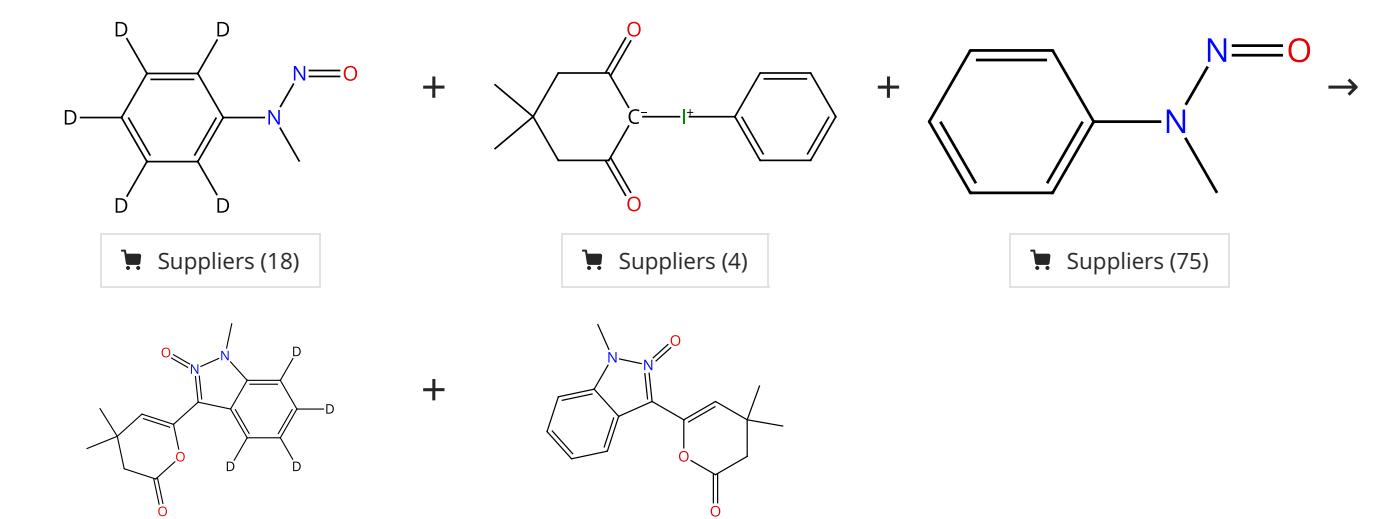
1.1 Reagents: Methanol-*d*₄, Cesium acetate, Water-*d*₂
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 18 h, rt

[Experimental Protocols](#)

Intramolecular Hydroarylation of Arenes via Imidazole-Directed C-H Activation in Aqueous Methanol Using Rhodium (III) as the Catalyst and Mechanistic Study

By: Sinha, Nilotpal; et al

Journal of Organic Chemistry (2023), 88(13), 8969-8983.

Scheme 3 (1 Reaction)


31-614-CAS-36835367

Steps: 1 Yield: 78%

1.1 Reagents: Methanol-*d*₄, Silver oxide (Ag₂O)

Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoro antimonate(1-) (1:2)

Solvents: 1,1,1,3,3-Hexafluoro-2-propanol; 30 min, 60 °C; 60 °C → rt

1.2 Reagents: Water

Experimental Protocols

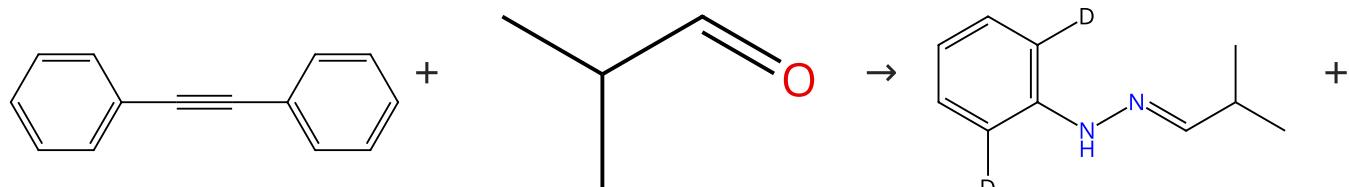
Condition-Controlled Selective Synthesis of Pyranone-Tethered Indazoles or Carbazoles through the Cascade Reactions of N-Nitrosoanilines with Iodonium Ylides

By: Wang, Kelin; et al

Organic Letters (2023), 25(24), 4422-4428.

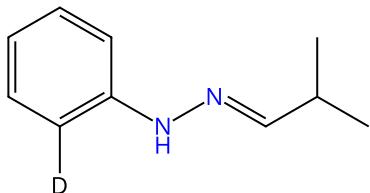
Scheme 4 (2 Reactions)

Steps: 1 Yield: 54-78%



Suppliers (88)

Suppliers (77)



31-079-CAS-6623260

Steps: 1 Yield: 78%

1.1 Reagents: Potassium acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*; 2 min, 80 °C

Rhodium(III)-Catalyzed C-H Activation and Indole Synthesis With Hydrazone as an Auto-Formed and Auto-Cleavable Directing Group

By: Zheng, Liyao; et al

Chemistry - A European Journal (2014), 20(8), 2352-2356.

31-079-CAS-4148873

Steps: 1 Yield: 54%

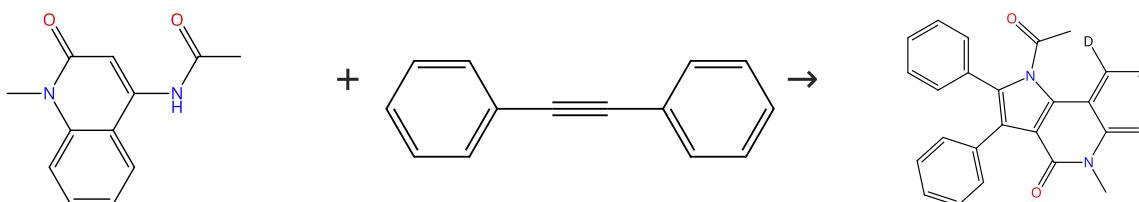
1.1 Reagents: Phenylhydrazine hydrochloride, Potassium acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-*d*; 2 min, 80 °C

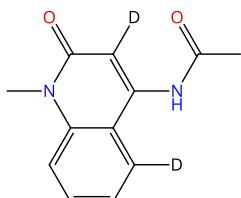
Rhodium(III)-Catalyzed C-H Activation and Indole Synthesis With Hydrazone as an Auto-Formed and Auto-Cleavable Directing Group

By: Zheng, Liyao; et al

Chemistry - A European Journal (2014), 20(8), 2352-2356.

Scheme 5 (1 Reaction)

Suppliers (88)



31-614-CAS-37762479

Steps: 1 Yield: 77%

1.1 Reagents: Methanol-*d*₄, OxygenCatalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

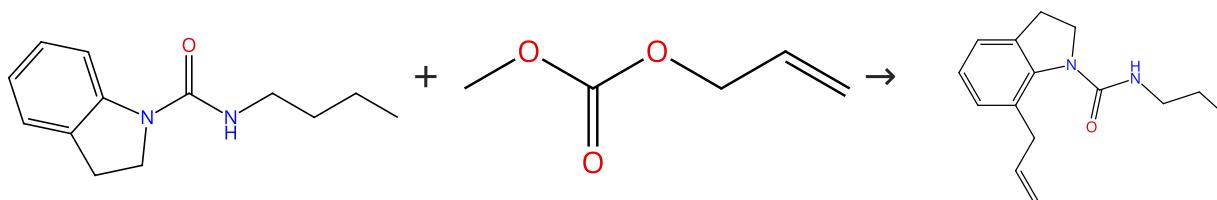
Solvents: (Trifluoromethyl)benzene; 6 h, 110 °C

Experimental Protocols

Rh(III)-catalyzed highly site- and regio-selective alkenyl C-H activation/annulation of 4-amino-2-quinolones with alkynes via reversible alkyne insertion

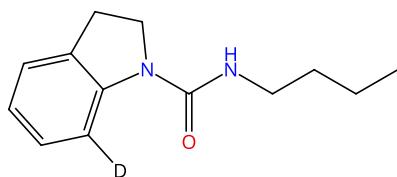
By: Hirako, Naohiro; et al

Chemical Science (2023), 14(39), 10971-10978.

Scheme 6 (1 Reaction)

Suppliers (4)

Suppliers (62)



31-085-CAS-3036752

Steps: 1 Yield: 74%

1.1 Reagents: Cupric acetate, Methanol-*d*Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: Tetrahydrofuran; 3 h, rt

Experimental Protocols

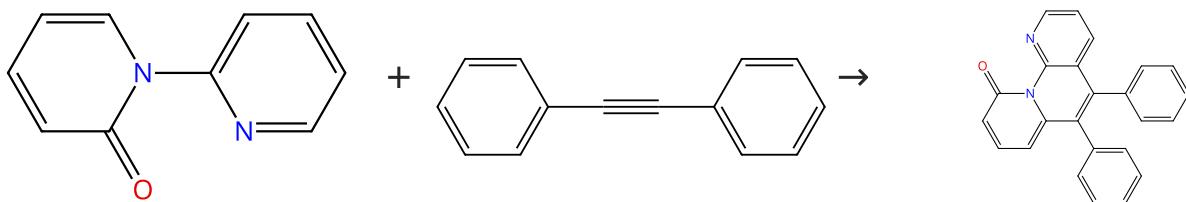
Mild Rh(III)-Catalyzed C7-Allylation of Indolines with Allylic Carbonates

By: Park, Jihye; et al

Journal of Organic Chemistry (2015), 80(3), 1818-1827.

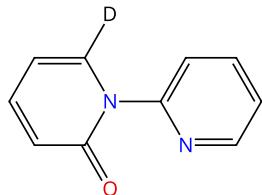
Scheme 7 (1 Reaction)

Steps: 1 Yield: 72%



Suppliers (8)

Suppliers (88)



31-116-CAS-23743551

Steps: 1 Yield: 72%

1.1 Reagents: Pivalic acid, Methanol-*d*₄
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; rt; 3 h, 130 °C

Rhodium(III)-Catalyzed C-H Bond Functionalization of 2-Pyridones with Alkynes: Switchable Alkenylation, Alkenylation/Directing Group Migration and Rollover Annulation

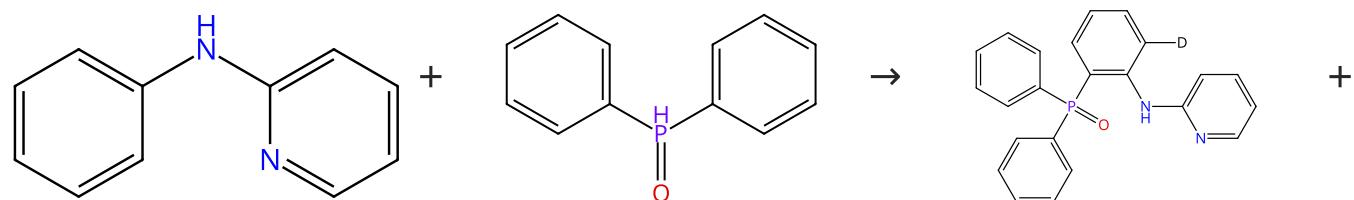
By: Xu, Xin; et al

Chemistry - A European Journal (2021), 27(34), 8811-8821.

Experimental Protocols

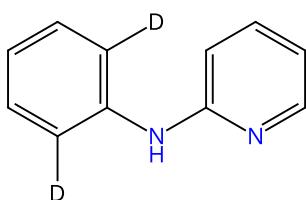
Scheme 8 (1 Reaction)

Steps: 1 Yield: 72%



Suppliers (73)

Suppliers (92)



31-116-CAS-20723503

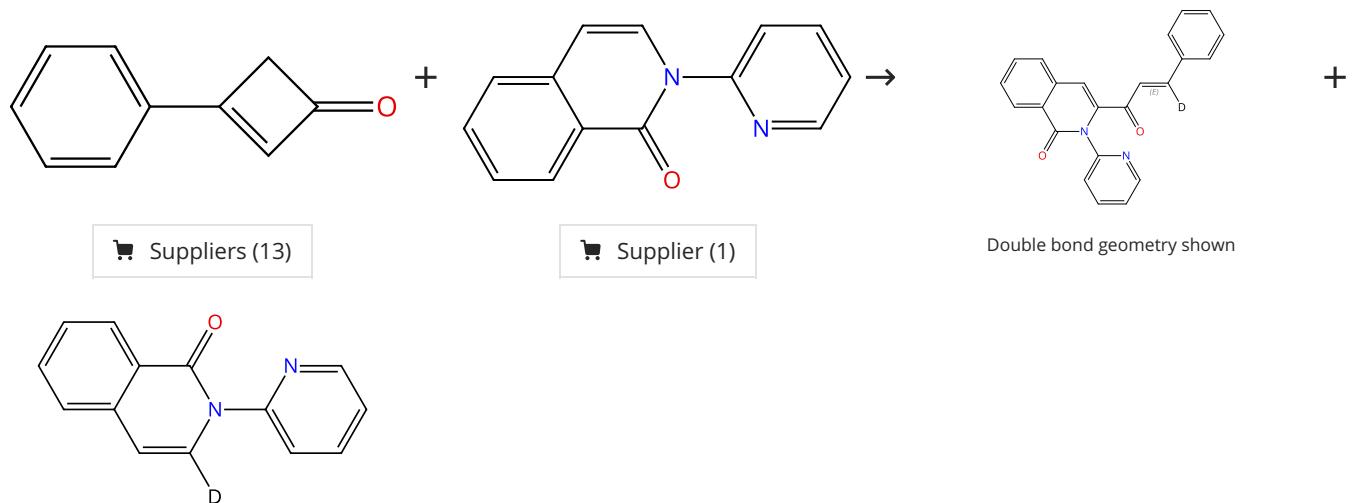
Steps: 1 Yield: 72%

1.1 Reagents: Methanol-*d*₄, Potassium hexafluorophosphate
Catalysts: Bis(acetato-κO)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]rhodium; 6.7 h, reflux

Scalable Rhodium(III)-Catalyzed Aryl C-H Phosphorylation Enabled by Anodic Oxidation Induced Reductive Elimination

By: Wu, Zheng-Jian; et al

Angewandte Chemie, International Edition (2019), 58(47), 16770-16774.

Scheme 9 (1 Reaction)

31-116-CAS-23008686

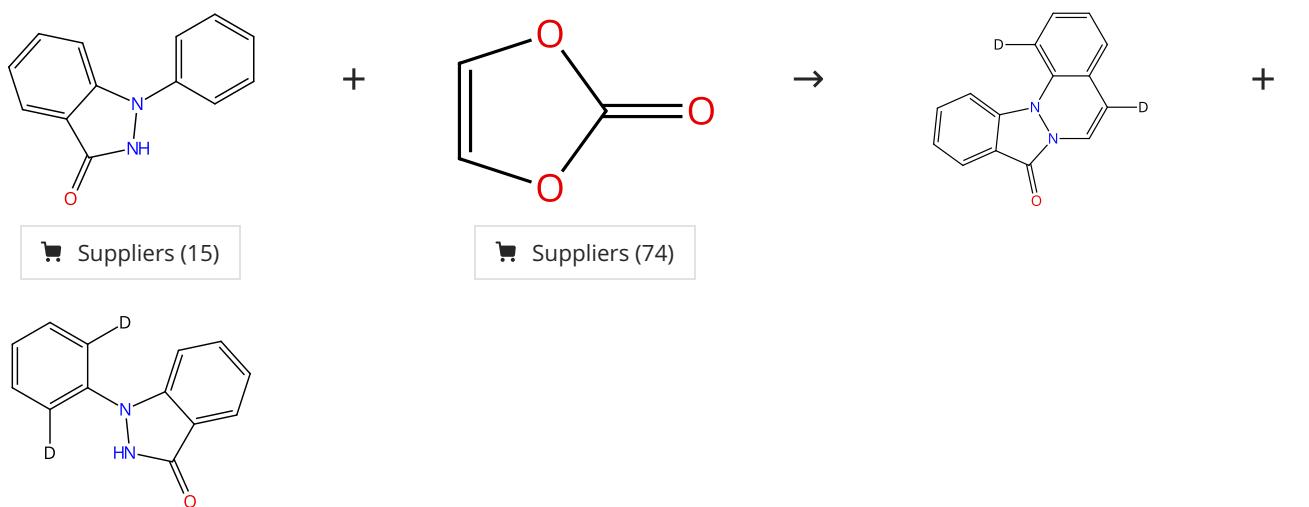
Steps: 1 Yield: 69%

1.1 Reagents: Methanol-*d*₄, Boric acid (H₃BO₃)
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 12 h, 100 °C

Rh(III)-Catalyzed acylation of heteroarenes with cyclobutanones via C-H/C-C bond activation

By: Cui, Yixin; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(100), 15631-15634.

Scheme 10 (1 Reaction)

31-614-CAS-24621057

Steps: 1 Yield: 67%

1.1 Reagents: Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*C₆-11)-hexafluoro antimonate(1-) (1:2)
Solvents: 1,2-Dichloroethane; rt; 7 h, 100 °C

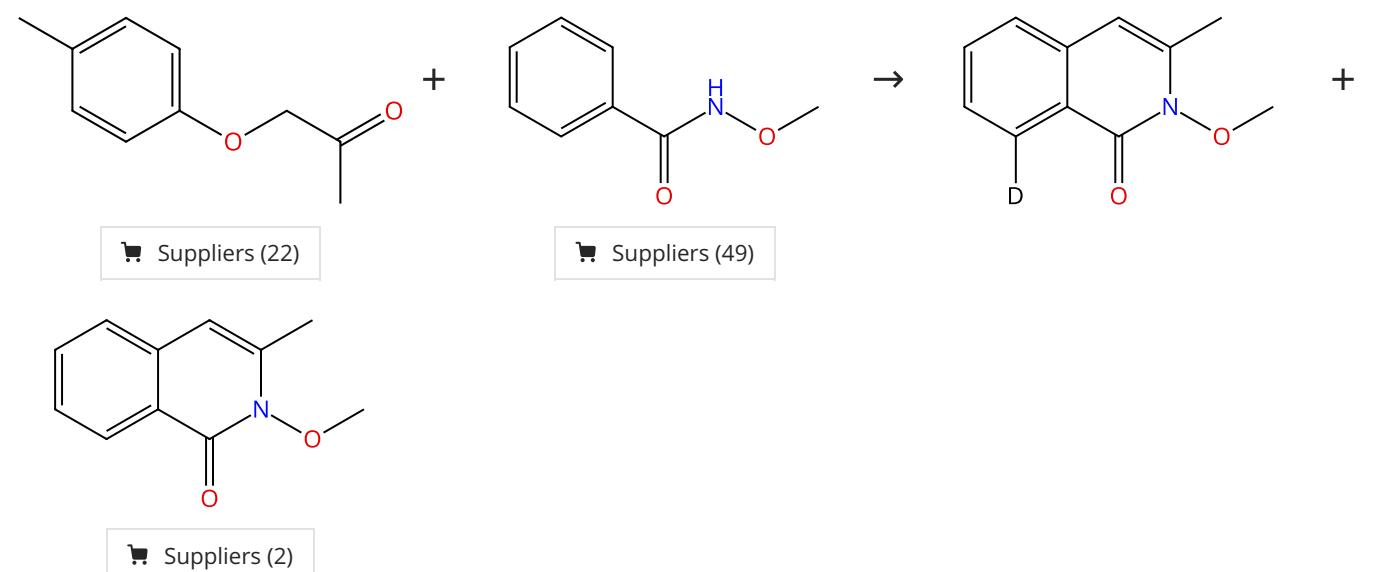
Synthesis of Cinnolines via Rh(III)-Catalyzed Annulation of N-Aryl Heterocycles with Vinylene Carbonate

By: Kim, Suho; et al

Asian Journal of Organic Chemistry (2021), 10(11), 3005-3014.

Experimental Protocols

Scheme 11 (1 Reaction)



31-116-CAS-4433947

Steps: 1 Yield: 64%

1.1 Reagents: Sodium acetate

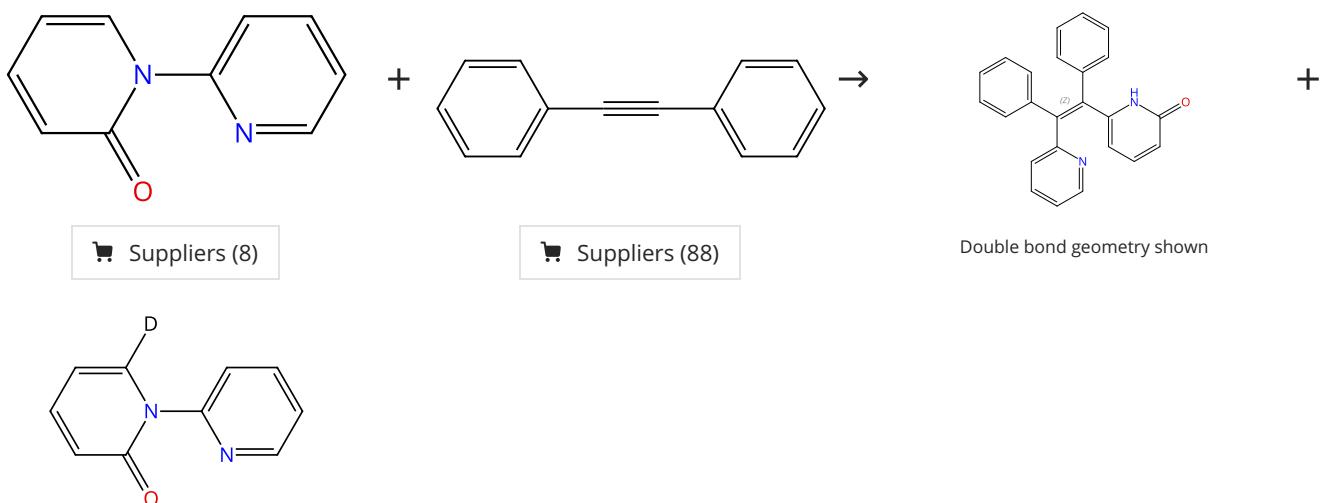
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl], (OC-6-11)-hexafluoro antimonate(1-) (1:2)Solvents: Methanol-*d*₄; 20 min, 60 °C α -MsO/TsO/Cl Ketones as Oxidized Alkyne Equivalents: Redox-Neutral Rhodium(III)-Catalyzed C-H Activation for the Synthesis of N-Heterocycles

By: Yu, Da-Gang; et al

Angewandte Chemie, International Edition (2014), 53(10), 2754-2758.

Scheme 12 (1 Reaction)

Steps: 1 Yield: 64%



31-116-CAS-23743413

Steps: 1 Yield: 64%

1.1 Reagents: Trifluoroacetic acid, Methanol-*d*₄Catalysts: Cupric acetate, Bis[dichloro[η ⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; rt; 2 h, 130 °C

Rhodium(III)-Catalyzed C-H Bond Functionalization of 2-Pyridones with Alkynes: Switchable Alkenylation, Alkenylation/Directing Group Migration and Rollover Annulation

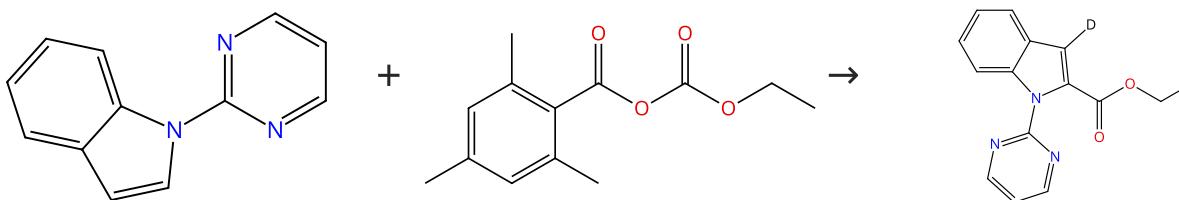
By: Xu, Xin; et al

Chemistry - A European Journal (2021), 27(34), 8811-8821.

Experimental Protocols

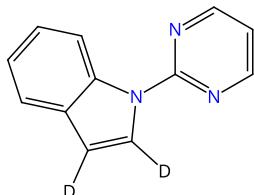
Scheme 13 (1 Reaction)

Steps: 1 Yield: 61%



Suppliers (59)

Suppliers (2)



31-614-CAS-39948006

Steps: 1 Yield: 61%

1.1 Reagents: Ethanol-*d*Catalysts: Potassium iodide, Rhodium, tetracarbonyldi- μ -chlorodi-

Solvents: Tetrahydrofuran; 30 min, 80 °C

Experimental Protocols

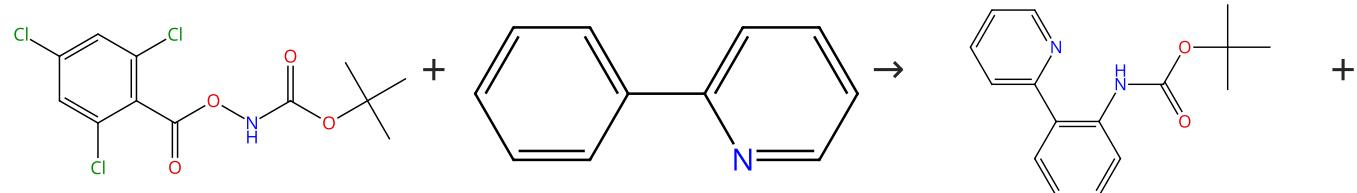
Rhodium-catalysed additive-free alkoxycarbonylation of indoles: 2,4,6-trimethylbenzoic acid-based carbonate anhydrides as a versatile alkoxycarboxyl source

By: Suzuki, Hirotugu; et al

Organic & Biomolecular Chemistry (2024), 22(16), 3209-3214.

Scheme 14 (1 Reaction)

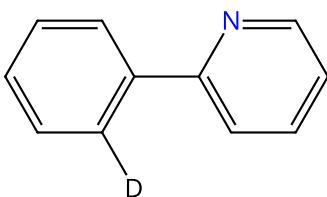
Steps: 1 Yield: 60%



Suppliers (2)

Suppliers (94)

Suppliers (5)



Suppliers (6)

31-080-CAS-3124645

Steps: 1 Yield: 60%

Rh[III]-Catalyzed C-H Amidation Using Aroyloxycarbamates To Give N-Boc Protected Arylamines

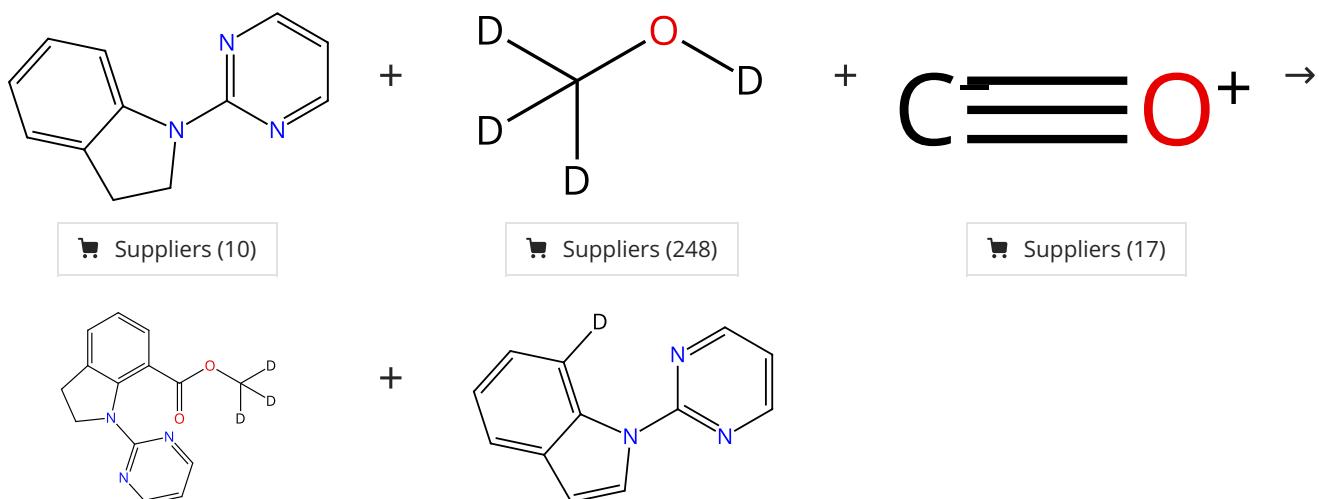
By: Grohmann, Christoph; et al

Organic Letters (2013), 15(12), 3014-3017.

Experimental Protocols

Scheme 15 (1 Reaction)

Steps: 1 Yield: 60%



31-116-CAS-20540909

Steps: 1 Yield: 60%

1.1 Reagents: Copper propionate
 Catalysts: Rhodium trichloride trihydrate
 Solvents: Toluene; 3 h, 110 °C

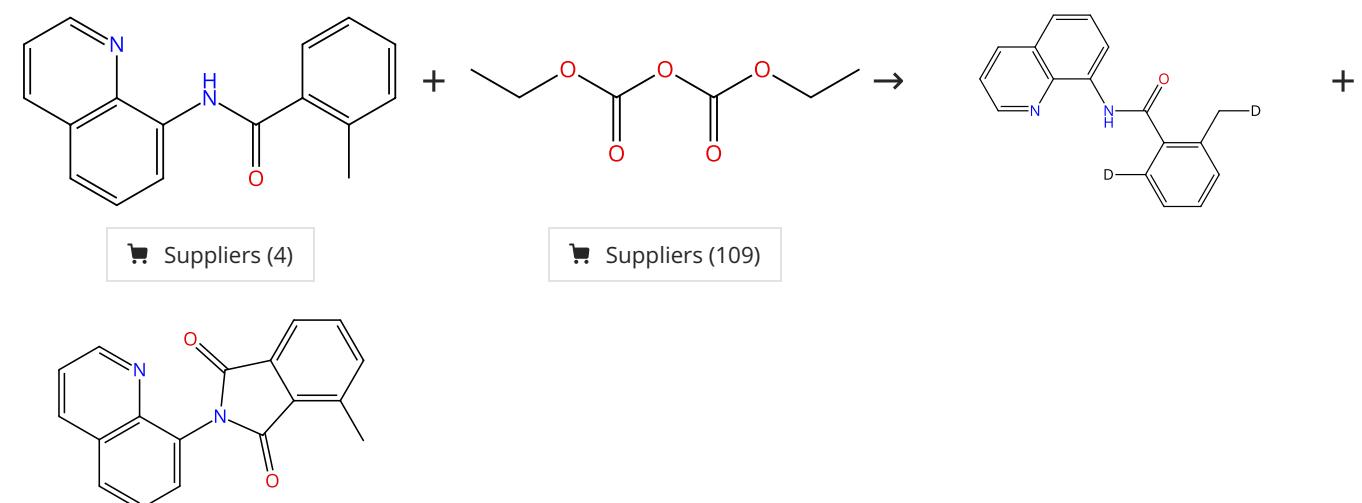
RhCl₃·3H₂O-Catalyzed C7-Selective C-H Carbonylation of Indolines with CO and Alcohols

By: Du, Rongrong; et al

Organic Letters (2019), 21(16), 6418-6422.

Scheme 16 (1 Reaction)

Steps: 1 Yield: 60%



31-614-CAS-39689535

Steps: 1 Yield: 60%

1.1 Reagents: Ethanol-d
 Catalysts: Dicarbonylrhodium acetylacetone
 Solvents: N-Methyl-2-pyrrolidone; 1 h, 130 °C

Rhodium-catalysed additive-free carbonylation of benzamides with diethyl dicarbonate as a carbonyl source

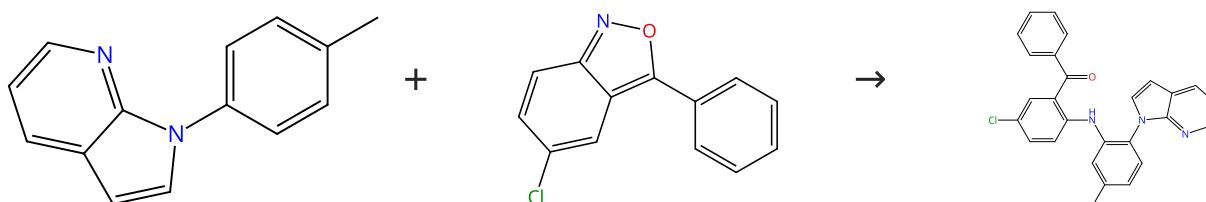
By: Suzuki, Hirotugu; et al

Organic & Biomolecular Chemistry (2024), 22(14), 2744-2748.

Experimental Protocols

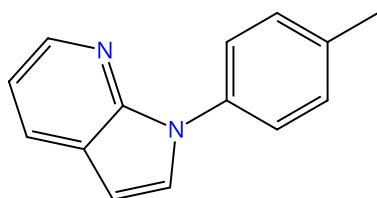
Scheme 17 (1 Reaction)

Steps: 1 Yield: 60%



Suppliers (2)

Suppliers (68)



31-614-CAS-28666984

Steps: 1 Yield: 60%

1.1 Reagents: Methanol-*d*₄Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 2 h, 120 °C

Experimental Protocols

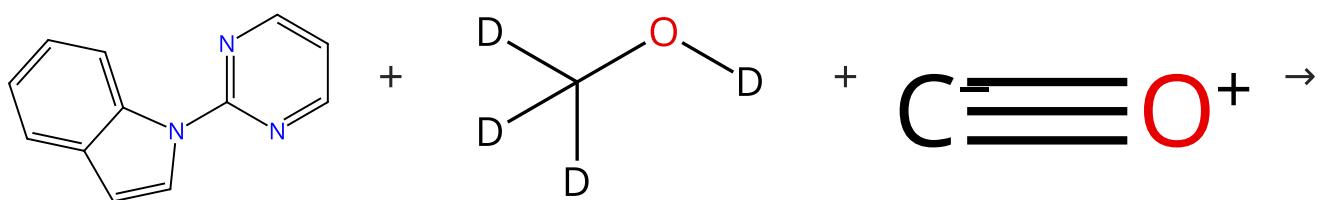
Site-Selective Rhodium(III)-Catalyzed C-H Amination of 7-Azaindoles with Anthranils: Synthesis and Anticancer Evaluation

By: Jeon, Mijin; et al

Advanced Synthesis & Catalysis (2017), 359(20), 3471-3478.

Scheme 18 (1 Reaction)

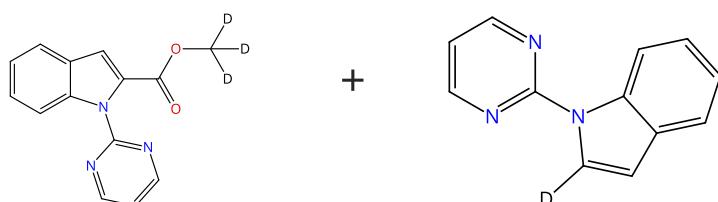
Steps: 1 Yield: 60%



Suppliers (59)

Suppliers (248)

Suppliers (17)



Suppliers (3)

31-116-CAS-20328309

Steps: 1 Yield: 60%

RhCl₃·3H₂O-Catalyzed Regioselective C(sp²)-H Alkoxy carbonylation: Efficient Synthesis of Indole- and Pyrrole-2-carboxylic Acid Esters

By: Zhao, Kang; et al

ACS Catalysis (2019), 9(6), 5545-5551.

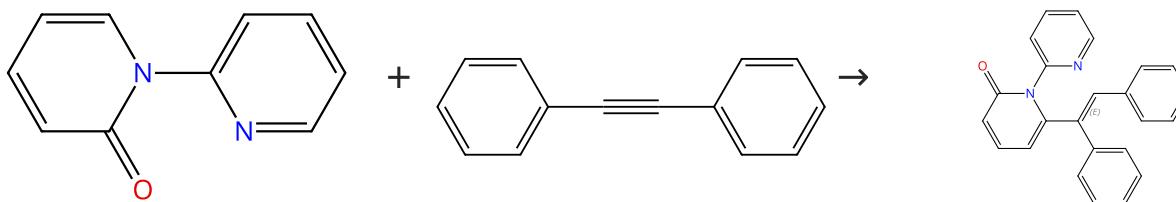
1.1 Reagents: Cupric acetate

Catalysts: Rhodium trichloride trihydrate

Solvents: Dimethylformamide; 2 h, 1 atm, 90 °C

Scheme 19 (1 Reaction)

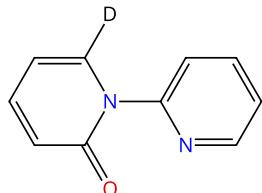
Steps: 1 Yield: 60%



Suppliers (8)

Suppliers (88)

Double bond geometry shown



31-116-CAS-23739502

Steps: 1 Yield: 60%

1.1 Reagents: Acetic acid, Methanol-*d*₄Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: Ethanol; rt; 2 h, 130 °C

Experimental Protocols

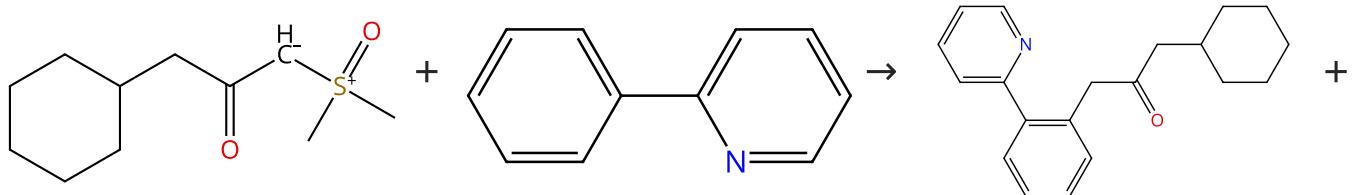
Rhodium(III)-Catalyzed C-H Bond Functionalization of 2-Pyridones with Alkynes: Switchable Alkenylation, Alkenylation/Directing Group Migration and Rollover Annulation

By: Xu, Xin; et al

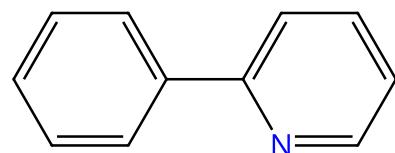
Chemistry - A European Journal (2021), 27(34), 8811-8821.

Scheme 20 (1 Reaction)

Steps: 1 Yield: 58%



Suppliers (94)



31-614-CAS-26746289

Steps: 1 Yield: 58%

1.1 Reagents: Sodium acetate, Oxygen

Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: 1,2-Dichlorobenzene, 2-Propan-2-*d*-ol-*d*, 1,1,1,3,3,3-hexafluoro-; 17 h, 60 °C

Experimental Protocols

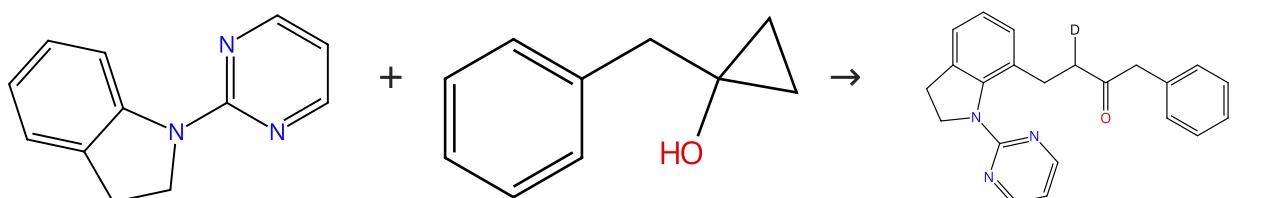
Cross-Coupling of α-Carbonyl Sulfoxonium Ylides with C-H Bonds

By: Barday, Manuel; et al

Angewandte Chemie, International Edition (2017), 56(42), 13117-13121.

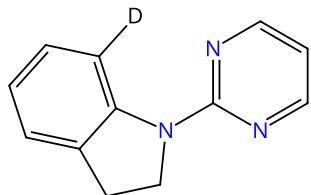
Scheme 21 (1 Reaction)

Steps: 1 Yield: 55%



Suppliers (10)

Suppliers (37)



31-085-CAS-15627315

Steps: 1 Yield: 55%

1.1 Reagents: Cupric acetate, Cesium acetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]Solvents: Methanol-d₄; 2 h, 25 °C

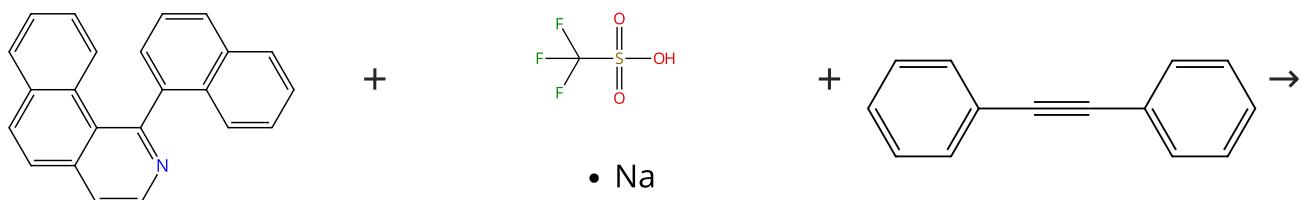
Rhodium(III)-Catalyzed Mild Alkylation of (Hetero)Arenes with Cyclopropanols via C-H Activation and Ring Opening

By: Zhou, Xukai; et al

Journal of Organic Chemistry (2016), 81(11), 4869-4875.

Scheme 22 (1 Reaction)

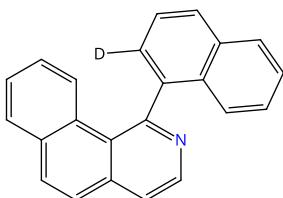
Steps: 1 Yield: 54%



Suppliers (87)

Suppliers (88)

Multi-component structure image available in CAS SciFinder



31-116-CAS-23240001

Steps: 1 Yield: 54%

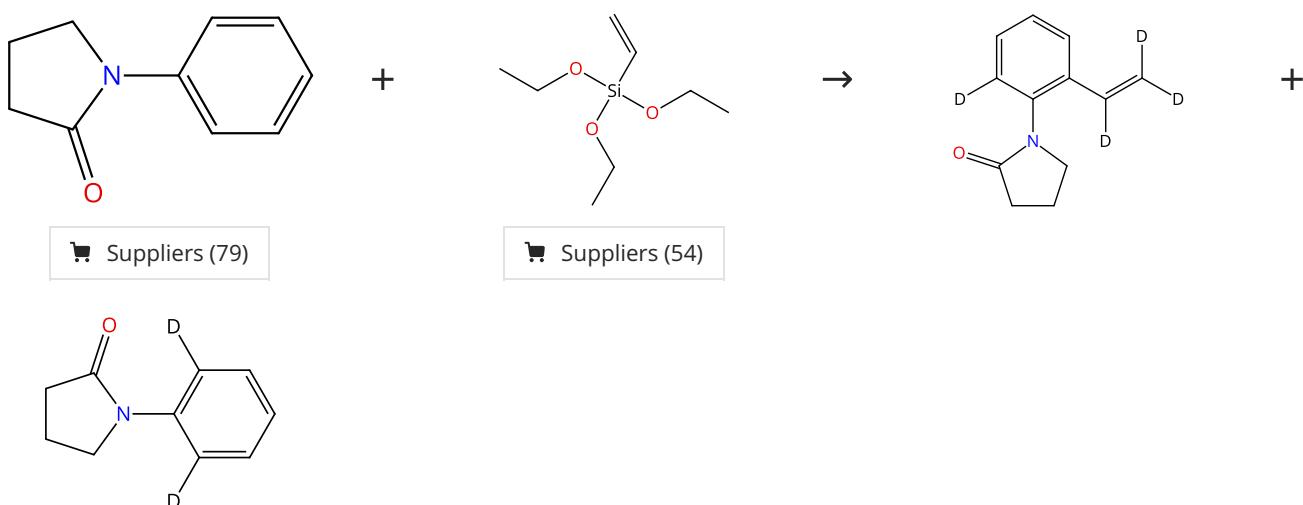
1.1 Reagents: Silver fluoride, Water-d₂Catalysts: (αS)-1,3-Dioxo-α-(phenylmethyl)-1H-benz[de]isoquinoline-2(3H)-acetic acid, Bis(η²-ethene)[(8a,9,10,11,11a-η)-(2aS)-1,2,3,4-tetrahydro-7,13-dimethoxy-8H-cyclopenta[5,6]cyclonona[1,2,3-cd:1,9,8-c'd]diinden-8a(12H)-yl]rhodiumSolvents: Methanol-d₄; 2 h, 80 °C

Enantioselective Synthesis of Azoniahelicenes by Rh-Catalyzed C-H Annulation with Alkynes

By: Wang, Qiang; et al

Journal of the American Chemical Society (2021), 143(1), 114-120.

Scheme 23 (1 Reaction)



31-116-CAS-20002469

Steps: 1 Yield: 53%

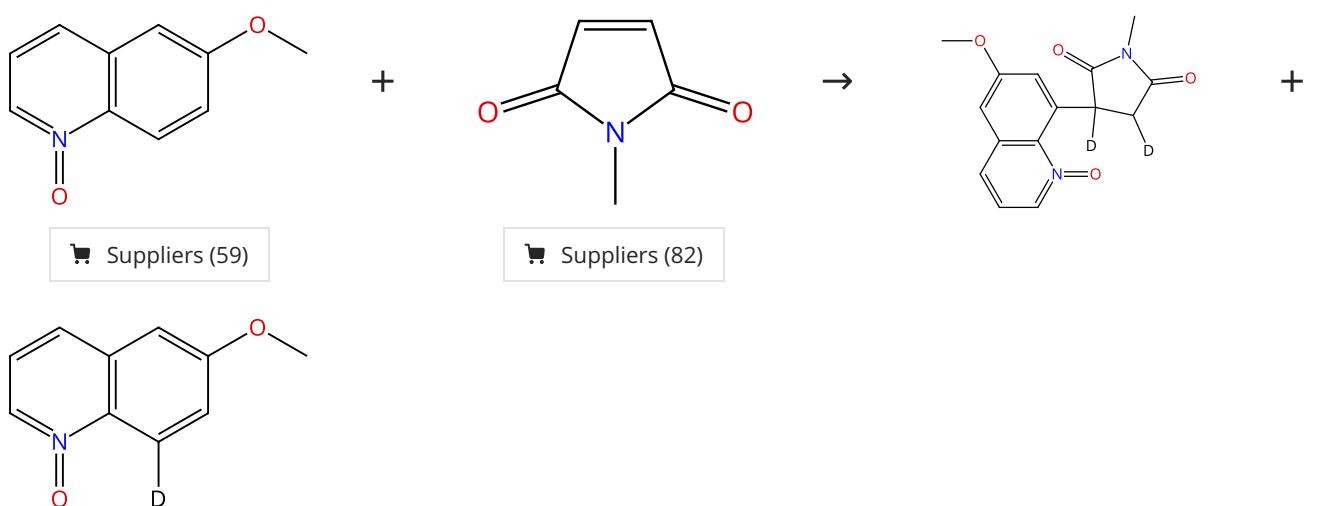
- 1.1 **Reagents:** Cupric acetate, Methanol-*d*, Lithium fluoride
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 12 h, 120 °C; 120 °C → rt
- 1.2 **Solvents:** Water; 5 min, rt

Rhodium(III)-Catalyzed C-H Vinylation of Arenes: Access to Functionalized Styrenes

By: Zhou, Jun; et al

Chinese Journal of Chemistry (2018), 36(12), 1143-1146.

Scheme 24 (1 Reaction)



31-085-CAS-23554246

Steps: 1 Yield: 53%

- 1.1 **Reagents:** Methanol-*d*₄, Acetic acid-*d*₄, Silver hexafluoro antimonate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 5 h, 80 °C

Site-Selective C8-Alkylation of Quinoline N-Oxides with Maleimides under Rh(III) Catalysis

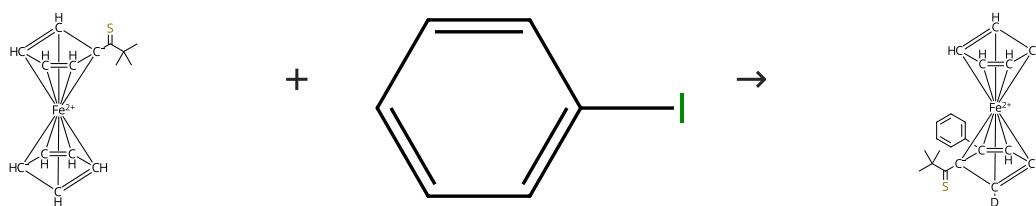
By: An, Won; et al

Journal of Organic Chemistry (2021), 86(11), 7579-7587.

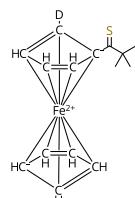
Experimental Protocols

Scheme 25 (1 Reaction)

Steps: 1 Yield: 50%



Suppliers (104)



31-116-CAS-22835840

Steps: 1 Yield: 50%

- 1.1 **Reagents:** Methanol-*d*₄, Lithium *tert*-butoxide, (3*aR*,8*aR*)-Tetrahydro-2,2-dimethyl-4,6,8,8-pentaphenyl-1,3-dioxolo[4,5-*e*][1,3,2]dioxaphosphepin
Catalysts: Di- μ -chlorotetrakis(η^2 -ethene)dirhodium
Solvents: 1,4-Dioxane; 4 h, 80 °C

Thioketone-directed rhodium(I) catalyzed enantioselective C-H bond arylation of ferrocenes

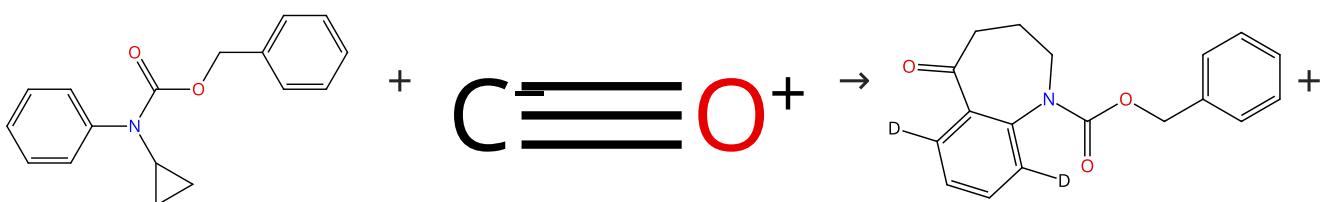
By: Cai, Zhong-Jian; et al

Nature Communications (2019), 10(1), 1-8.

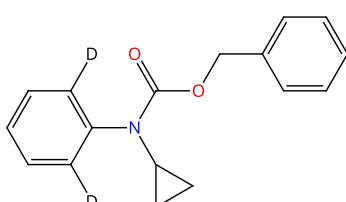
Experimental Protocols

Scheme 26 (1 Reaction)

Steps: 1 Yield: 46%



Suppliers (17)



31-116-CAS-18574791

Steps: 1 Yield: 46%

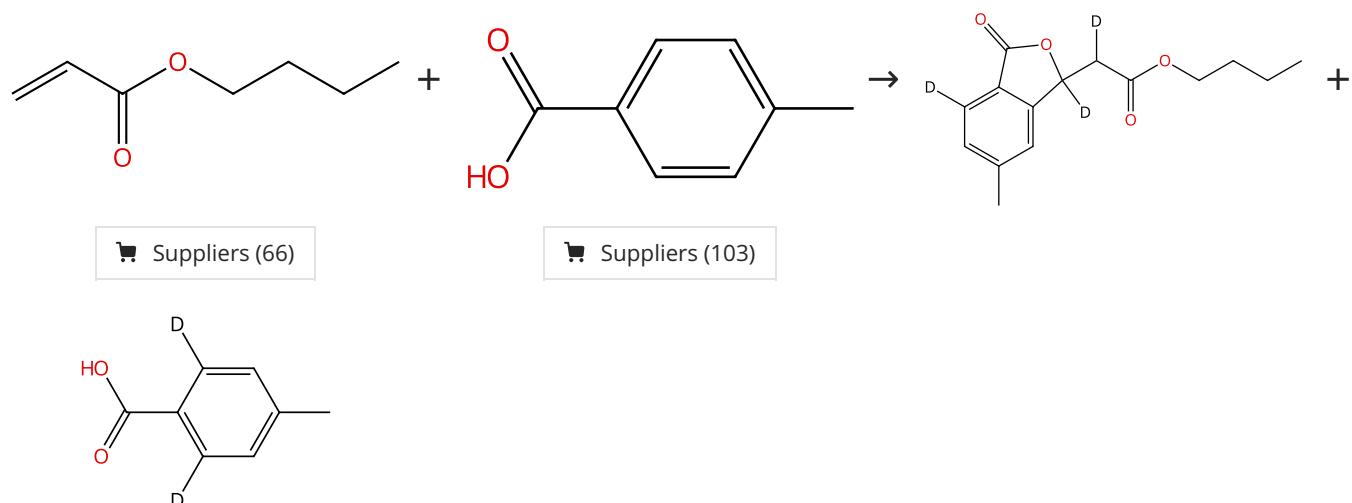
- 1.1 **Reagents:** 2-Nitrobenzoic acid, Sodium sulfate
Catalysts: Tris[4-(trifluoromethyl)phenyl]phosphine, Rhodium (1+), bis[(1,2,5,6- η)-1,5-cyclooctadiene]-, 1,1,1-trifluoro methanesulfonate (1:1)
Solvents: Benzonitrile; 10 min; 10 s
1.2 **Reagents:** Methanol-*d*₄; 24 h, 1 atm, 130 °C

Modular Access to Azepines by Directed Carbonylative C-C Bond Activation of Aminocyclopropanes

By: Wang, Gang-Wei; et al

Journal of the American Chemical Society (2018), 140(8), 2743-2747.

Scheme 27 (1 Reaction)



31-085-CAS-20010719

Steps: 1 Yield: 45%

- 1.1 **Reagents:** Potassium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 16 h, 60 °C
- 1.2 **Reagents:** Sodium bicarbonate
Solvents: Water

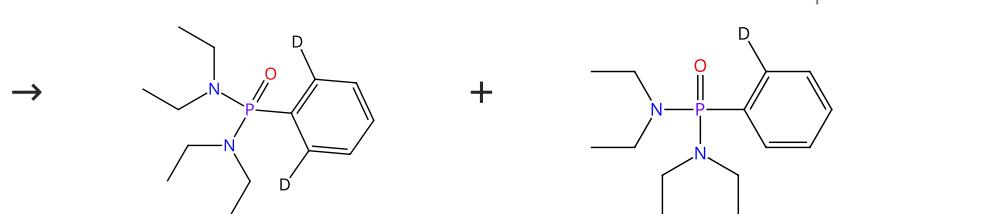
Electrooxidative Rhodium-Catalyzed C-H/C-H Activation: Electrictiy as Oxidant for Cross-Dehydrogenative Alkenylation

By: Qiu, Youai; et al

Angewandte Chemie, International Edition (2018), 57(20), 5828-5832.

Experimental Protocols

Scheme 28 (1 Reaction)



31-116-CAS-13613208

Steps: 1 Yield: 43%

- 1.1 **Reagents:** Pivalic acid, Methanol-*d*₄
Catalysts: Cupric acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: 1,2-Dichloroethane; 3 h, 110 °C

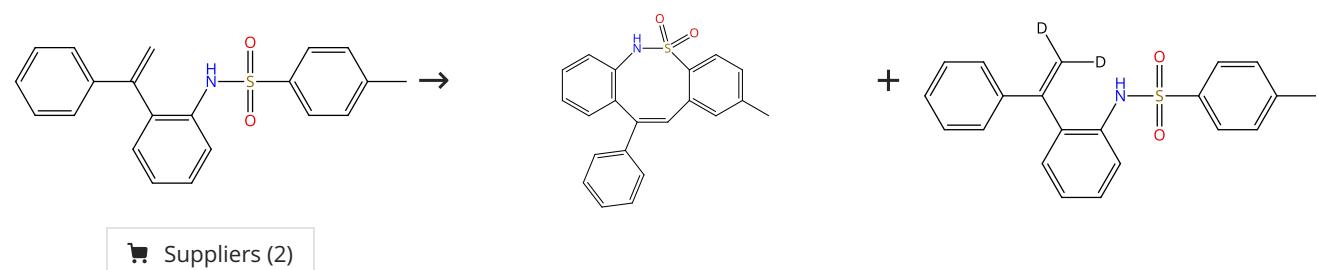
Phosphoryl-Related Directing Groups in Rhodium(III) Catalysis: A General Strategy to Diverse P-Containing Frameworks

By: Zhao, Dongbing; et al

Organic Letters (2013), 15(17), 4504-4507.

Experimental Protocols

Scheme 29 (1 Reaction)



31-116-CAS-22341754

Steps: 1 Yield: 42%

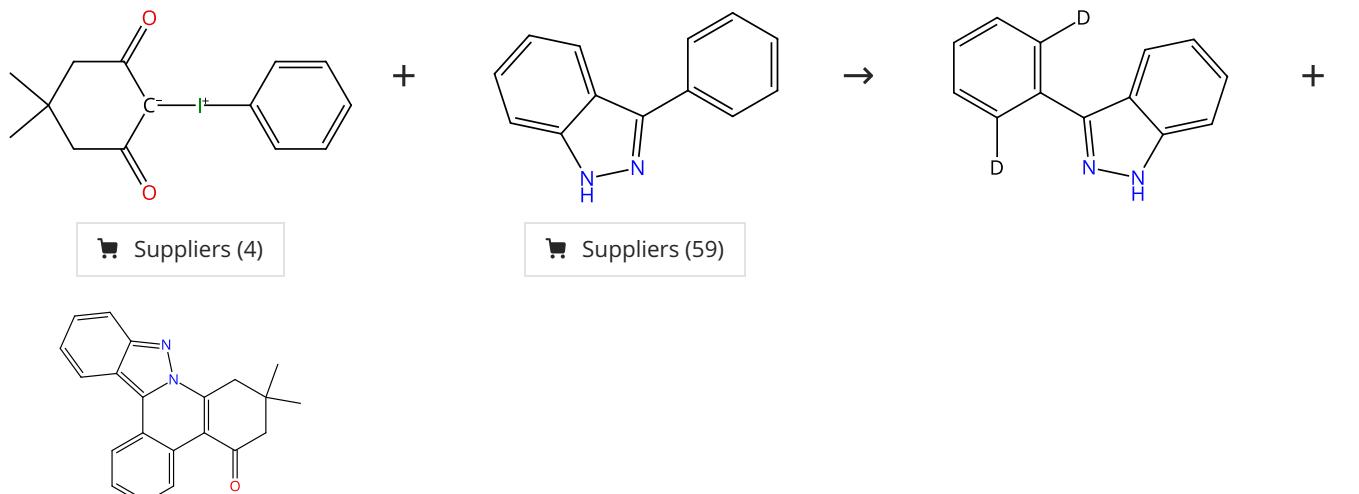
1.1 Reagents: Methanol-*d*₄, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)
Catalysts: Stereoisomer of di- μ -chlorodichlorobis[(1,2,3,4,5- η)-1-cyclohexyl-2,3,4,5-tetramethyl-2,4-cyclopentadien-1-yl]dirhodium
Solvents: 1,2-Dichloroethane; 24 h, 80 °C

Experimental and Computational Studies on Cp*^cYRh(III)/KO Piv-Catalyzed Intramolecular Dehydrogenative Cross-Couplings for Building Eight-Membered Sultam/Lactam Frameworks

By: Li, Liping; et al

Organic Letters (2020), 22(14), 5473-5478.

Scheme 30 (1 Reaction)



31-614-CAS-34501157

Steps: 1 Yield: 40%

1.1 Reagents: Acetic acid, Methanol-*d*
Catalysts: Bis[dichloro[η ⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 30 min, 38 °C

Experimental Protocols

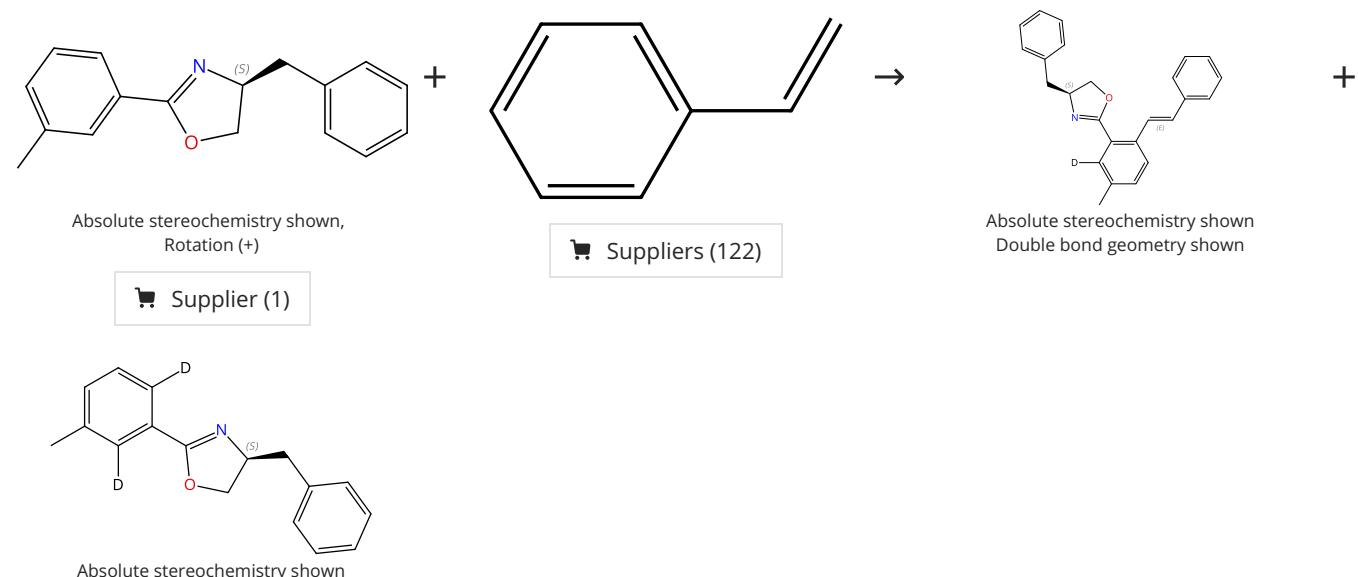
Synthesis of dihydroindazolo[2,3-*f*]phenanthridin-5(6*H*)-ones via Rh(iii)-catalyzed C-H activation of 2-aryl indazoles and annulation with iodonium ylides

By: Liang, Jiazh; et al

Green Chemistry (2022), 24(21), 8441-8446.

Scheme 31 (1 Reaction)

Steps: 1 Yield: 36%



31-116-CAS-11716097

Steps: 1 Yield: 36%

1.1 Reagents: Cupric acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Methanol-*d*₄; 1 h, 70 °C

1.2 Reagents: Ammonium acetate; 1 h, rt

Experimental Protocols

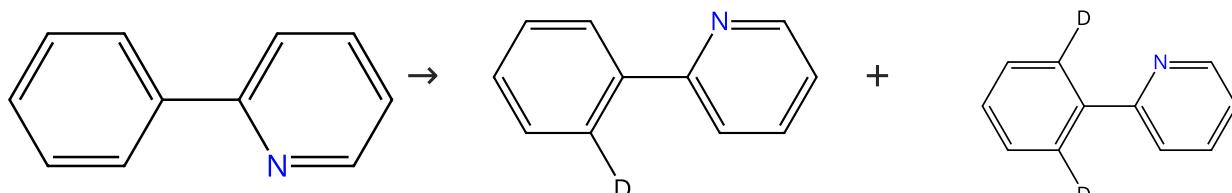
Synthesis of olefin-oxazoline ligands (OlefOx) by rhodium(III)-catalyzed oxidative olefination

By: Schroeder, Nils; et al

Advanced Synthesis & Catalysis (2012), 354(4), 579-583.

Scheme 32 (1 Reaction)

Steps: 1 Yield: 36%



Suppliers (94)

Suppliers (6)

Supplier (1)

31-116-CAS-11461360

Steps: 1 Yield: 36%

1.1 Reagents: Methanol-*d*₄
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*i*OC-6-11)-hexafluoro antimonate(1-) (1:2)
Solvents: 2,2,2-Trifluoroethanol, Methanol-*d*₄; 10 min, 140 °C

Experimental Protocols

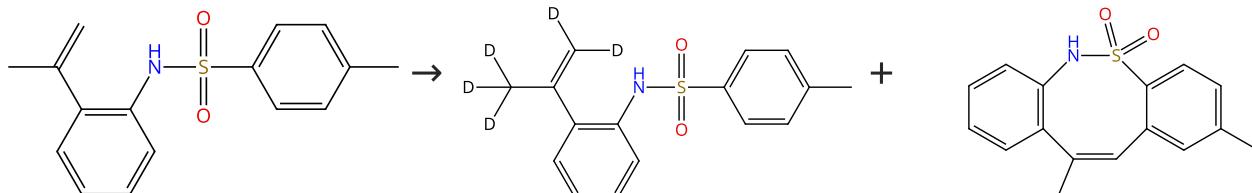
Rh^{III}-Catalyzed C-H Activation with Pyridotriazoles: Direct Access to Fluorophores for Metal-Ion Detection

By: Kim, Ju Hyun; et al

Angewandte Chemie, International Edition (2015), 54(37), 10975-10979.

Scheme 33 (1 Reaction)

Steps: 1 Yield: 33%



Suppliers (7)

31-116-CAS-22341753

Steps: 1 Yield: 33%

1.1 Reagents: Methanol-*d*₄, Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)
Catalysts: Stereoisomer of di-μ-chlorodichlorobis[(1,2,3,4,5-η)-1-cyclohexyl-2,3,4,5-tetramethyl-2,4-cyclopentadien-1-yl]dirhodium
Solvents: 1,2-Dichloroethane; 24 h, 80 °C

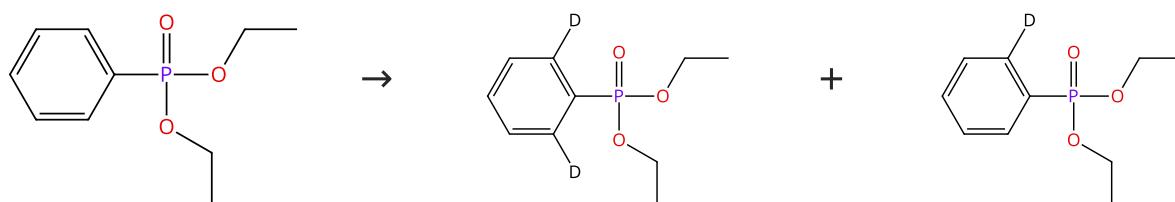
Experimental and Computational Studies on Cp*²CyRh(III)/KO₂Piv-Catalyzed Intramolecular Dehydrogenative Cross-Couplings for Building Eight-Membered Sultam/Lactam Frameworks

By: Li, Liping; et al

Organic Letters (2020), 22(14), 5473-5478.

Scheme 34 (1 Reaction)

Steps: 1 Yield: 33%



Suppliers (54)

31-116-CAS-11437792

Steps: 1 Yield: 33%

1.1 Reagents: Cupric acetate, Methanol-*d*₄, Oxygen
Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoroantimonate(1-) (1:2)
Solvents: 1,2-Dichloroethane; 3 h, 130 °C

Phosphoryl-Related Directing Groups in Rhodium(III) Catalysis: A General Strategy to Diverse P-Containing Frameworks

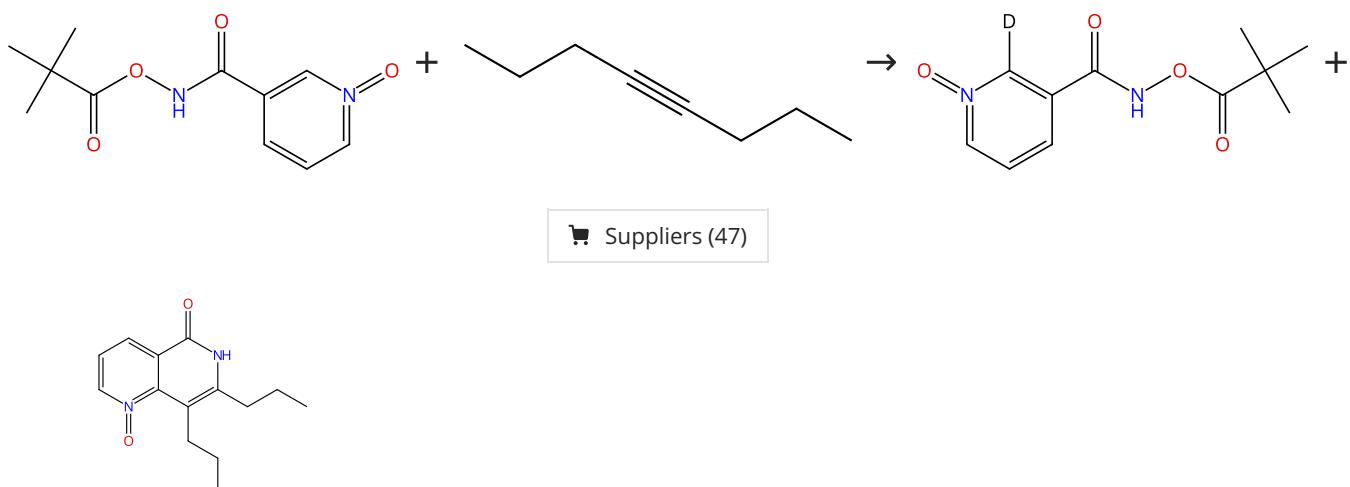
By: Zhao, Dongbing; et al

Organic Letters (2013), 15(17), 4504-4507.

Experimental Protocols

Scheme 35 (1 Reaction)

Steps: 1 Yield: 31%



31-116-CAS-12499356

Steps: 1 Yield: 31%

1.1 Reagents: Sodium acetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*₄; 1.5 h, 35 °C

Pyridine N-Oxide vs Pyridine Substrates for Rh(III)-Catalyzed Oxidative C-H Bond Functionalization

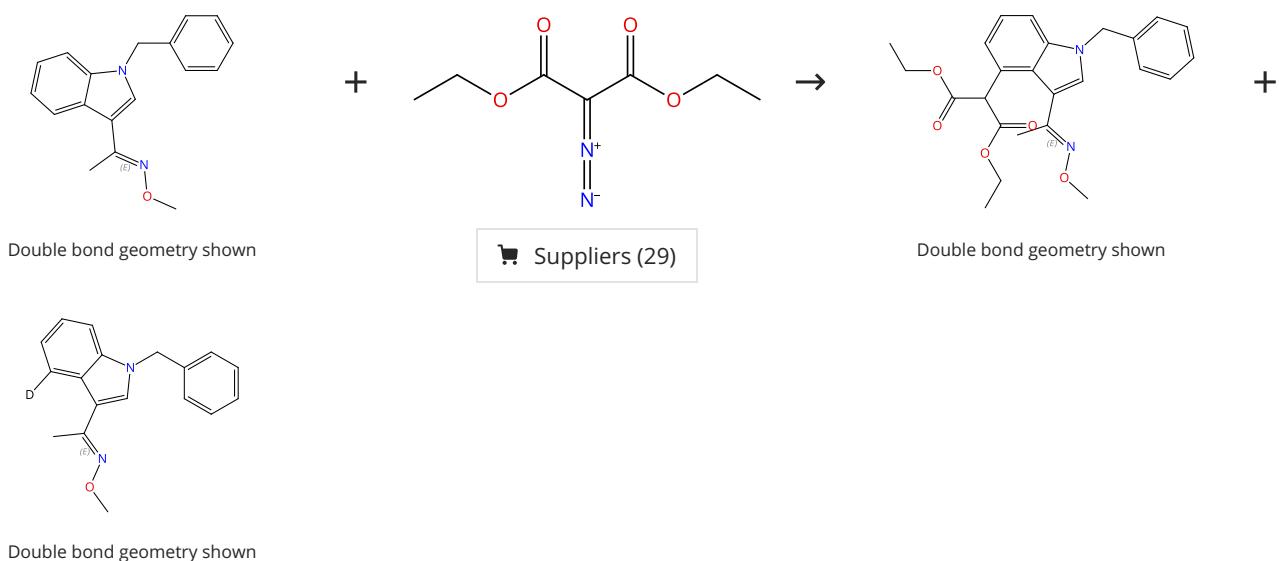
By: Neufeldt, Sharon R.; et al

Journal of the American Chemical Society (2015), 137(31), 9843-9854.

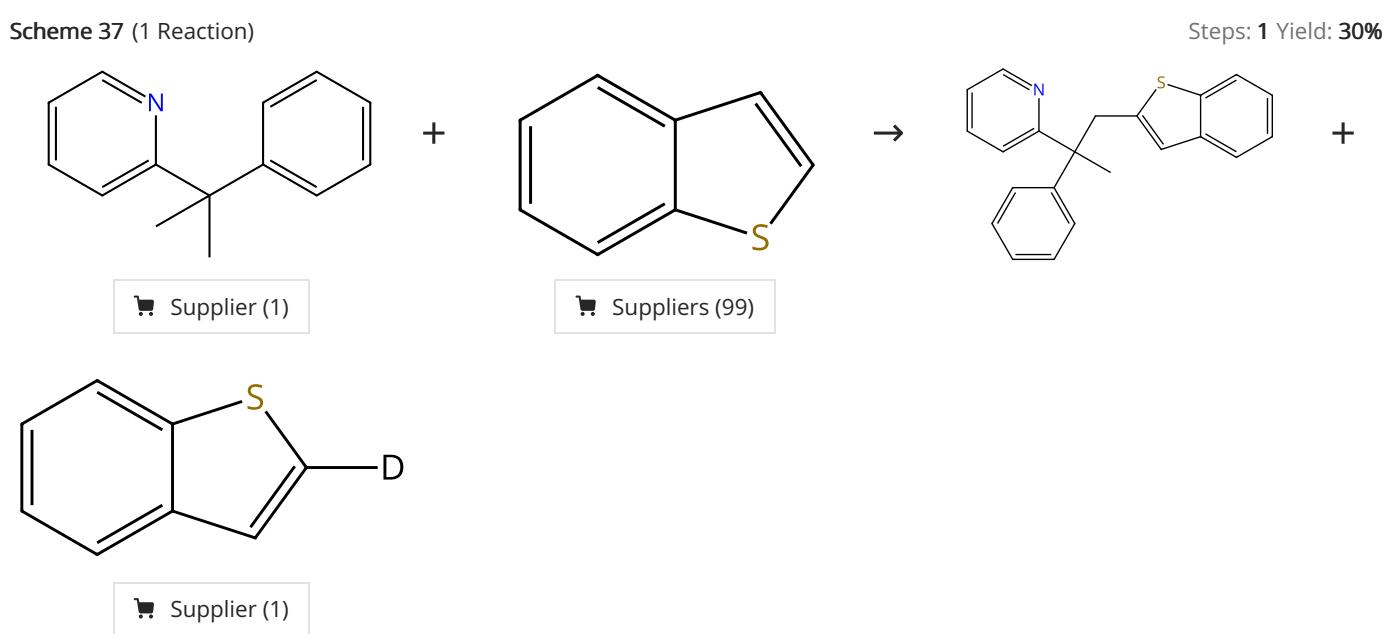
Experimental Protocols

Scheme 36 (1 Reaction)

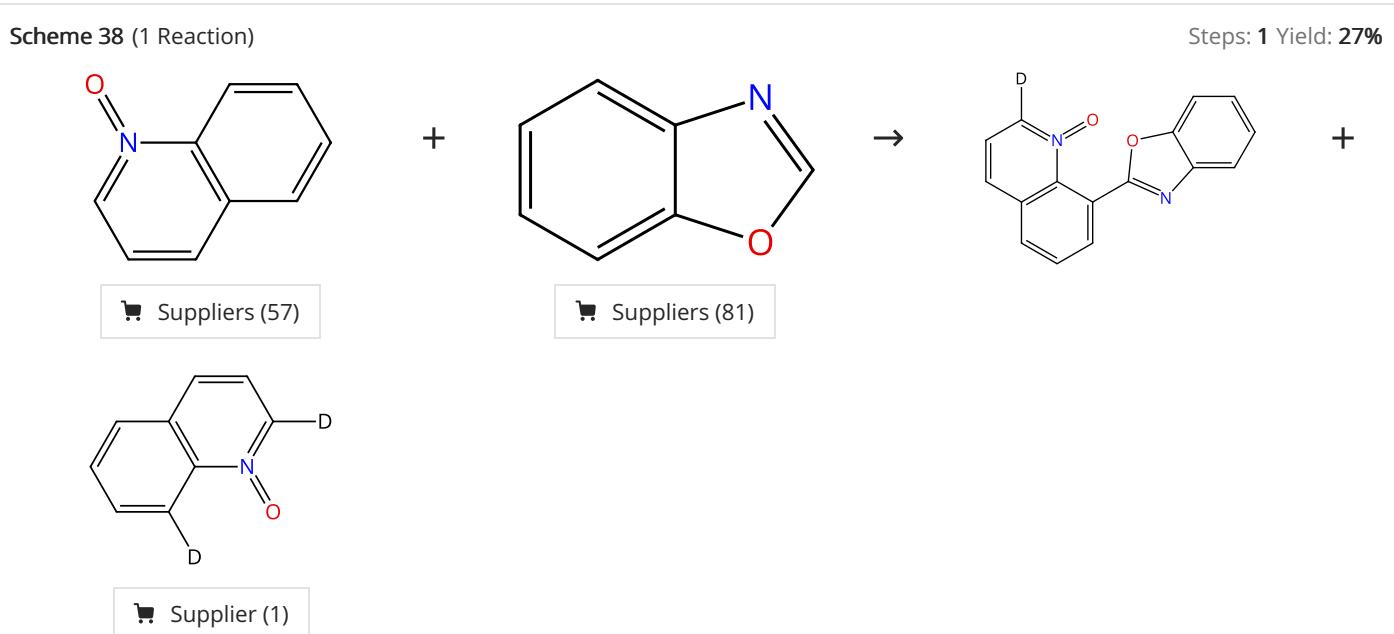
Steps: 1 Yield: 31%



31-116-CAS-18736390	Steps: 1 Yield: 31%	Rhodium(III)-Catalyzed Regioselective Direct C4-Alkylation and C2-Annulation of Indoles: Straightforward Access to Indolopryridone By: Biswas, Aniruddha; et al European Journal of Organic Chemistry (2018), 2018(12), 1426-1436.
<p>1.1 Reagents: Methanol-<i>d</i>₄</p> <p>Catalysts: Bis[Dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], [1,1,1-Trifluoro-<i>N</i>-[(trifluoromethyl)sulfonyl]-κ<i>O</i>]methanesulfonamidato-κ<i>O</i>]silver</p> <p>Solvents: 1,2-Dichloroethane; 3 h, 40 °C</p>		



31-116-CAS-17782807	Steps: 1 Yield: 30%	Rhodium(III)-Catalyzed Oxidative Cross-Coupling of Unreactive C(sp ³)-H Bonds with C(sp ²)-H Bonds By: Tan, Guangying; et al Organic Letters (2017), 19(18), 4782-4785.
1.1 Reagents: Methanol- <i>d</i> ₄ , Silver oxide (Ag ₂ O) Catalysts: Acetic acid- <i>d</i> , Bis[dichloro[n ⁵ -(pentamethylcycloptadienyl)]rhodium], Silver hexafluoroantimonate Solvents: Tetrahydrofuran, <i>tert</i> -Butyl alcohol- <i>d</i> ₄ 6 h, 140 °C		Experimental Protocols



31-614-CAS-37231263

Steps: 1 Yield: 27%

1.1 Reagents: Pivalic acid, Silver oxide (Ag_2O), 2-Propan-2-d-ol-*d*, 1,1,1,3,3,3-hexafluoro-

Catalysts: Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate; 5 h, 100 °C

Experimental Protocols

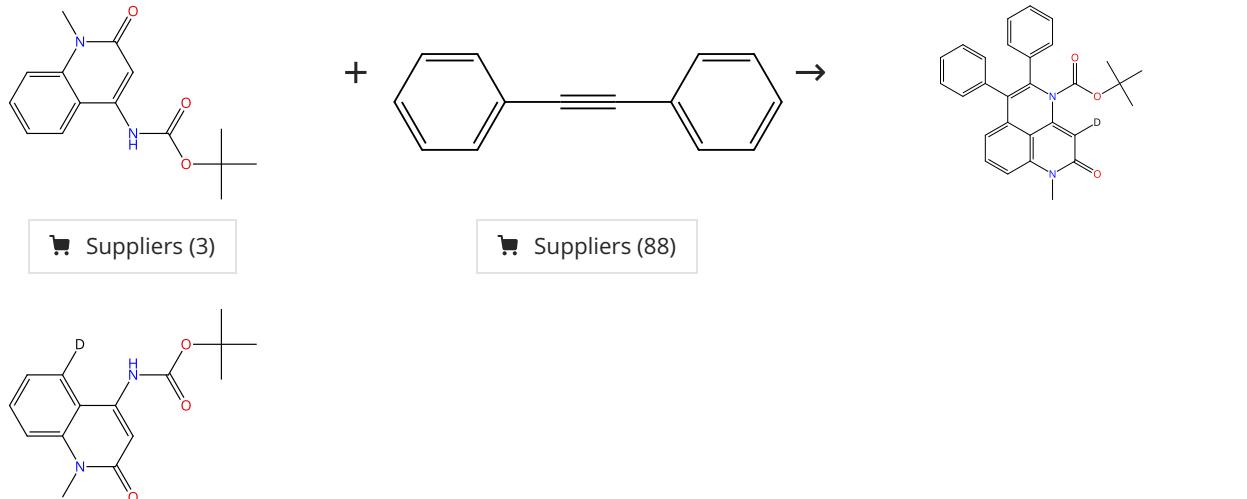
Construction of unsymmetrical heterobiaryls via the $\text{Cp}^*\text{Rh(II)}$ -catalyzed C-H/C-H coupling of heteroarenes

By: Parmar, Diksha; et al

Chemical Communications (Cambridge, United Kingdom) (2023), 59(63), 9646-9649.

Scheme 39 (1 Reaction)

Steps: 1 Yield: 24%



31-614-CAS-37762474

Steps: 1 Yield: 24%

1.1 Reagents: Methanol-*d*₄, Oxygen**Catalysts:** Cupric acetate, Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium]**Solvents:** (Trifluoromethyl)benzene; 6 h, 110 °C

Experimental Protocols

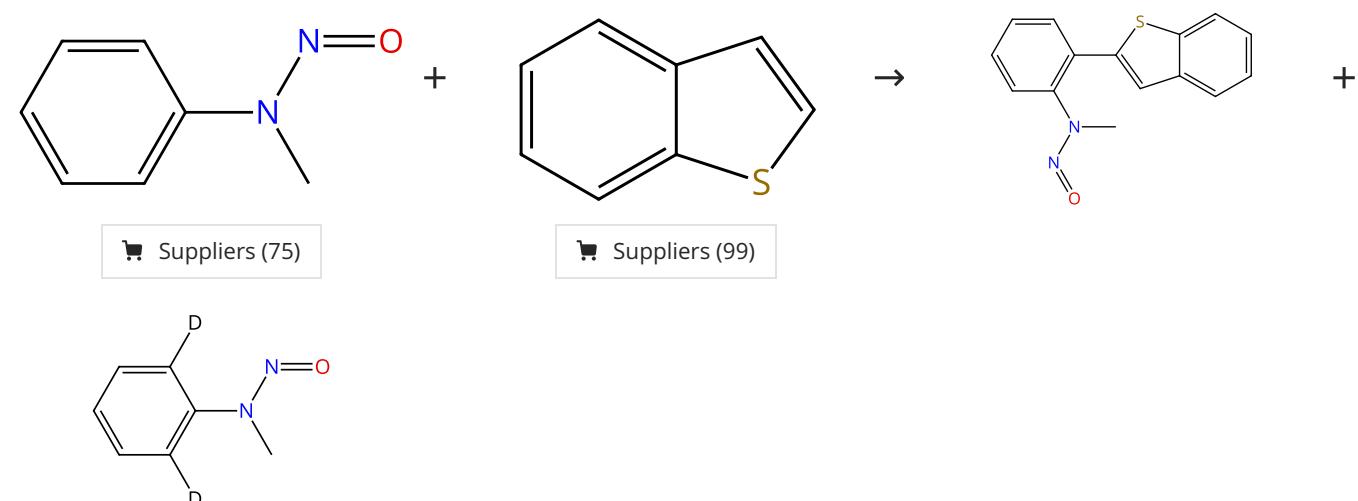
Rh(III)-catalyzed highly site- and regio-selective alkenyl C-H activation/annulation of 4-amino-2-quinolones with alkynes via reversible alkyne insertion

By: Hirako, Naohiro; et al

Chemical Science (2023), 14(39), 10971-10978.

Scheme 40 (1 Reaction)

Steps: 1 Yield: 21%



31-116-CAS-19206313

Steps: 1 Yield: 21%

1.1 Reagents: Sodium acetate, Methanol-*d*₄, Silver oxide (Ag_2O), Propanoic acid-*d*₄, 2,2-dimethyl-**Catalysts:** Bis[dichloro[η^5 -(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate**Solvents:** Tetrahydrofuran; 2 h, 60 °C

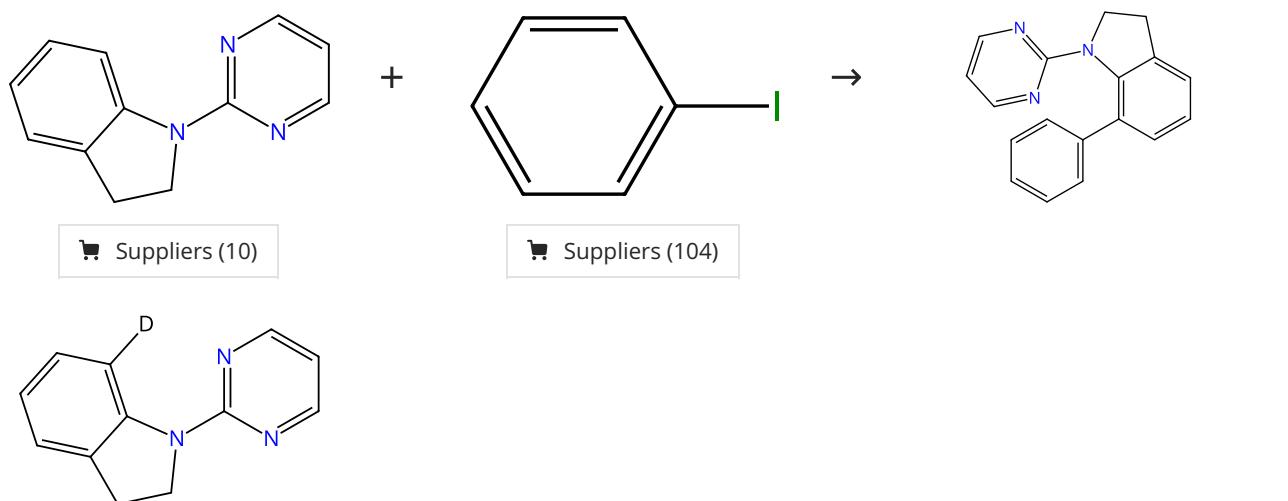
Experimental Protocols

Rhodium-catalyzed oxidative C-H/C-H cross-coupling of aniline with heteroarene: N-nitroso group enabled mild conditions

By: He, Shuang; et al

Chemical Communications (Cambridge, United Kingdom) (2018), 54(56), 7794-7797.

Scheme 41 (1 Reaction)



31-614-CAS-38881228

Steps: 1 Yield: 13%

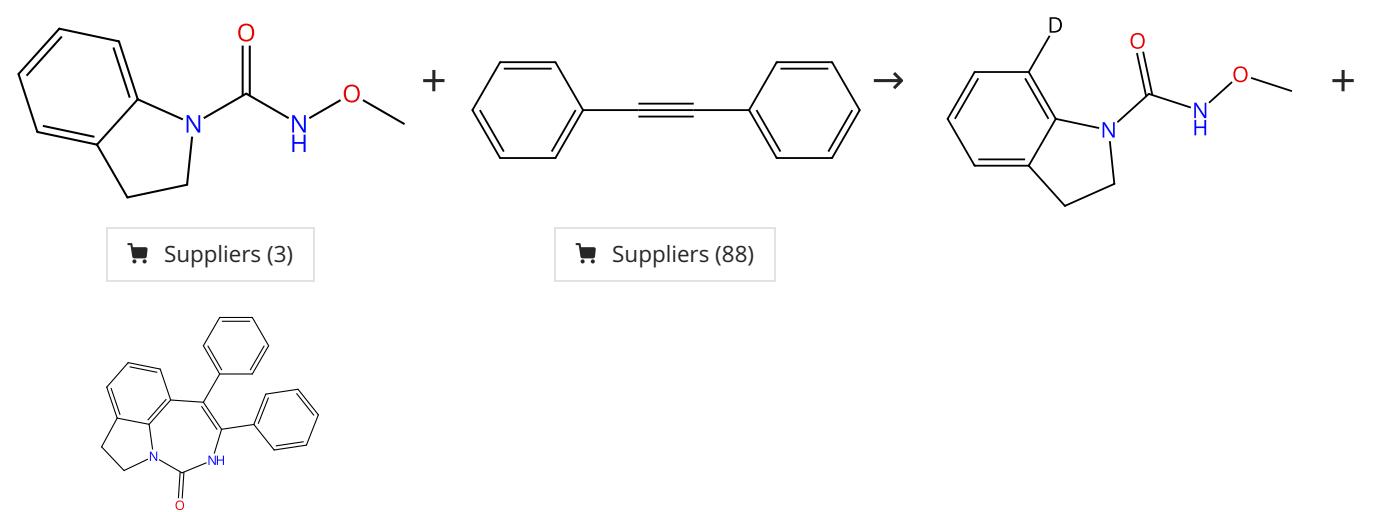
1.1 **Reagents:** Sodium carbonate, Carbon monoxide, Methanol-*d*₄, Copper bromide (CuBr)
Catalysts: Rhodium trichloride
Solvents: Toluene; 8 h, 130 °C

Directing group assisted rhodium-catalyzed formal C-H arylation and carbonylative arylation of arenes with aryl halides in the presence of CO

By: Teng, Houyun; et al

Journal of Catalysis (2024), 429, 115234.

Scheme 42 (1 Reaction)



31-116-CAS-9225924

Steps: 1 Yield: 10%

1.1 **Reagents:** Sodium acetate
Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: Methanol-*d*; 1 h, 80 °C

Access to Six- and Seven-Membered 1,7-Fused Indolines via Rh(III)-Catalyzed Redox-Neutral C7-Selective C-H Functionalization of Indolines with Alkynes and Alkenes

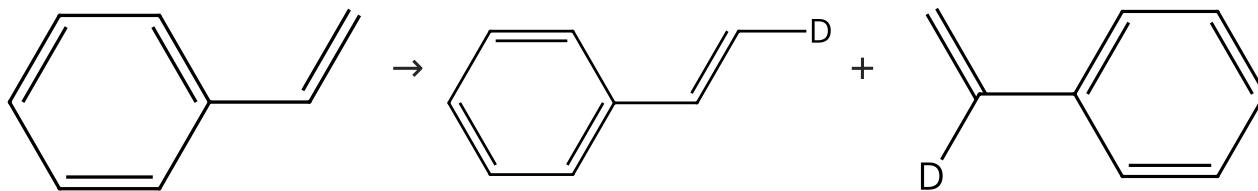
By: Wang, Xuan; et al

Journal of Organic Chemistry (2015), 80(12), 6238-6249.

Experimental Protocols

Scheme 43 (2 Reactions)

Steps: 1



Suppliers (122)

Supplier (1)

Suppliers (24)

31-116-CAS-5503276

Steps: 1

Hydride-Rhodium(III)-N-Heterocyclic Carbene Catalysts for Vinyl-Selective H/D Exchange: A Structure-Activity Study

By: Di Giuseppe, Andrea; et al

Chemistry - A European Journal (2014), 20(27), 8391-8403.

1.1 Reagents: Methanol-*d*₄**Catalysts:** (*SP*-5-52)-[1,3-Bis[2,6-bis(1-methylethyl)phenyl]-1,3-dihydro-2*H*-imidazol-2-ylidene]chlorohydro(2-methyl-8-quinolinolato-*kN'*,*kO*⁸)rhodium; 7 h, 80 °C

31-116-CAS-3445723

Steps: 1

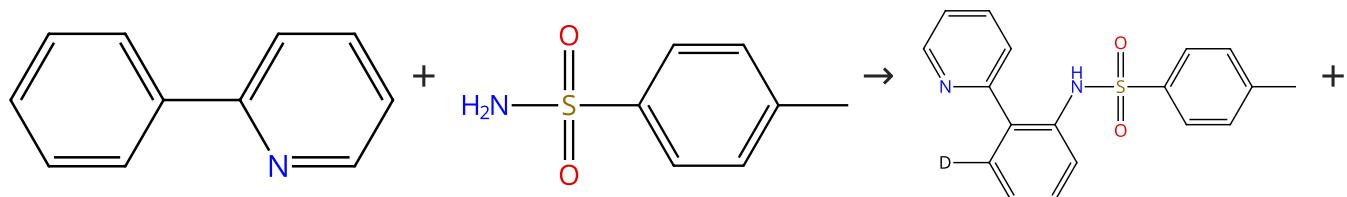
Hydride-Rhodium(III)-N-Heterocyclic Carbene Catalysts for Vinyl-Selective H/D Exchange: A Structure-Activity Study

By: Di Giuseppe, Andrea; et al

Chemistry - A European Journal (2014), 20(27), 8391-8403.

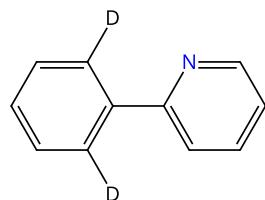
Scheme 44 (1 Reaction)

Steps: 1



Suppliers (94)

Suppliers (99)



Supplier (1)

31-080-CAS-3399231

Steps: 1

Rhodium(III)-Catalyzed Intermolecular N-Chelator-Directed Aromatic C-H Amidation with Amides

By: Zhao, Huaiqing; et al

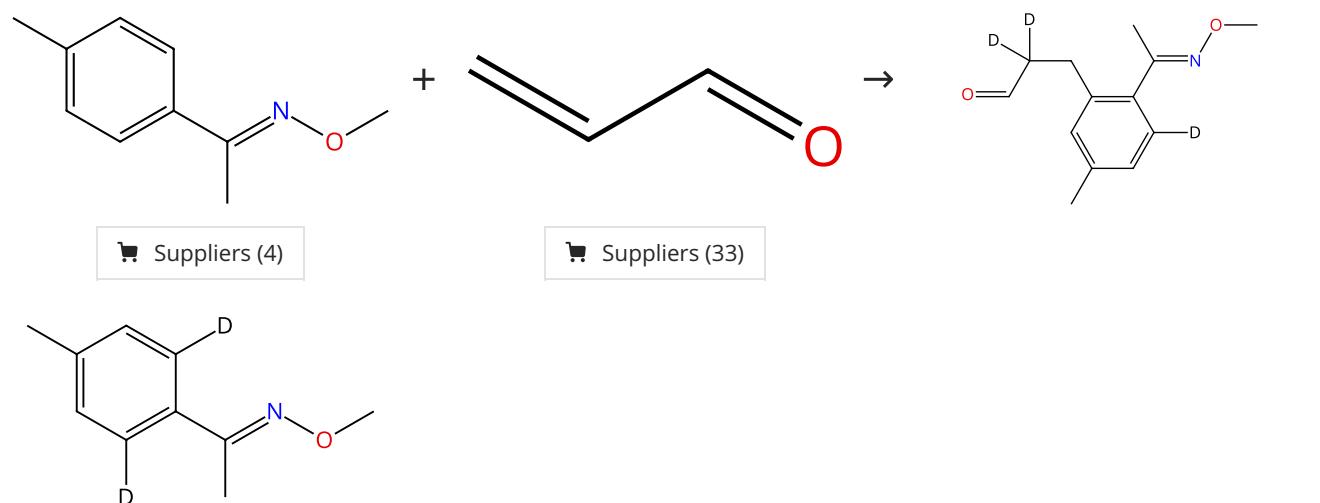
Organic Letters (2013), 15(19), 5106-5109.

1.1 Reagents: Iodobenzene diacetate

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate**Solvents:** Dichloromethane, Methanol-*d*₄; 1 h, 60 °C; cooled

Experimental Protocols

Scheme 45 (1 Reaction)



31-085-CAS-16571913

Steps: 1

1.1 Reagents: Propanoic acid, 2,2-dimethyl-, potassium salt (1:1)

Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonateSolvents: 2,2,2-Trifluoroethanol, Methanol-*d*₄; 4 h, 40 °C

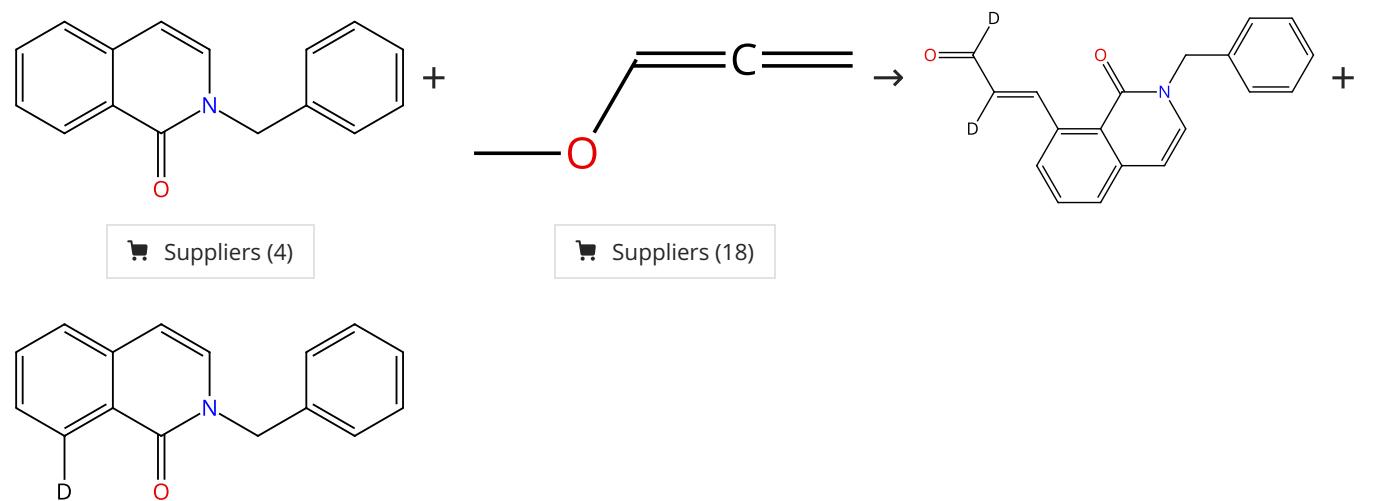
Carboxylate-Enhanced Rhodium(III)-Catalyzed Aryl C-H Alkylation with Conjugated Alkenes under Mild Conditions

By: Zhang, Zhao; et al

Journal of Organic Chemistry (2017), 82(1), 664-672.

Experimental Protocols

Scheme 46 (1 Reaction)



31-614-CAS-41397888

Steps: 1

1.1 Reagents: Cupric acetate, Methanol-*d*₄Catalysts: Bis[dichloro[n⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate

Solvents: 1,2-Dichloroethane; 3 h, 80 °C

Rh(III)-catalyzed regioselective C(sp²)-H alkenylation of isoquinolinones with methoxyallene: A facile access to aldehyde-bearing isoquinolinones

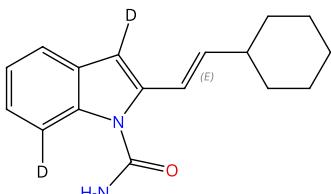
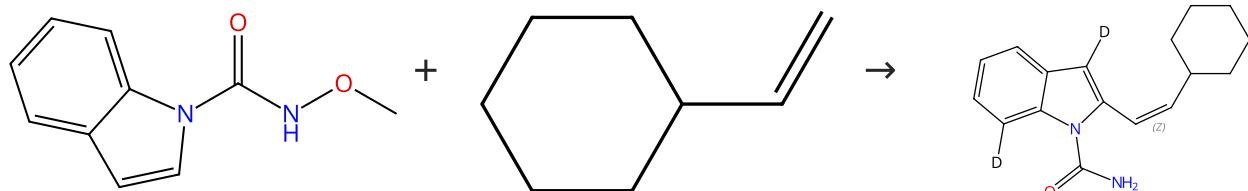
By: Thakur, Ankita; et al

Organic & Biomolecular Chemistry (2024), 22(32), 6612-6616.

Experimental Protocols

Scheme 47 (1 Reaction)

Steps: 1



Double bond geometry shown

31-614-CAS-31155174

Steps: 1

- 1.1 **Reagents:** Sodium acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Carbonothioic acid, *S*-methyl ester
Solvents: Tetrahydrofuran; 16 h, rt

Rh(III)-Catalyzed Selective Olefination of N-Carboxamide Indoles with Unactivated Olefins at Room Temperature via an Internal Oxidation

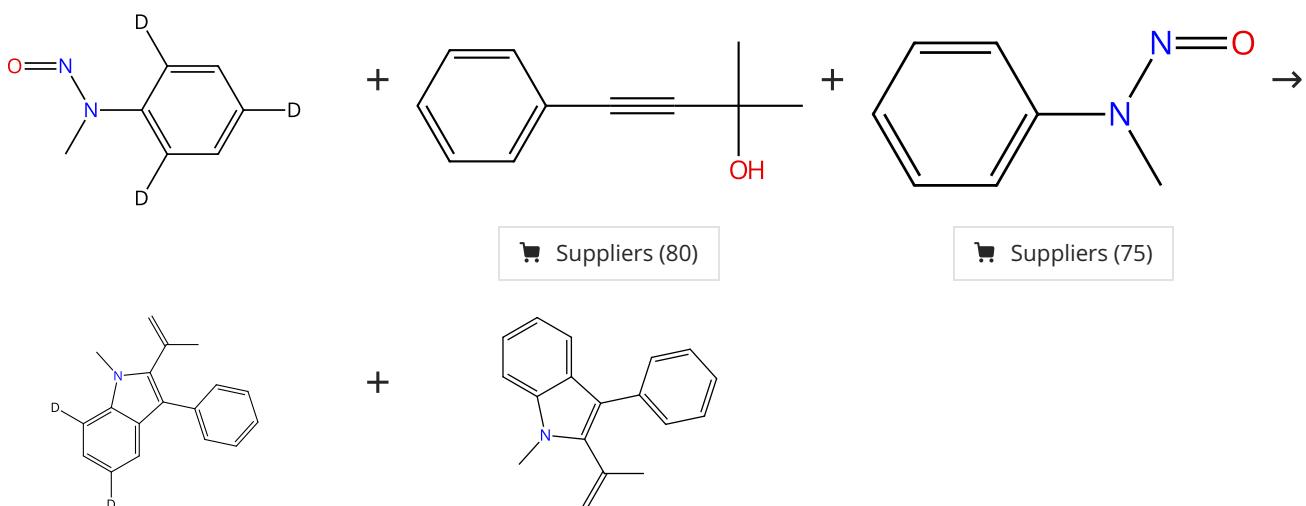
By: Prusty, Priyambada; et al

Organic Letters (2022), 24(5), 1121-1126.

Experimental Protocols

Scheme 48 (1 Reaction)

Steps: 1



31-399-CAS-19019415

Steps: 1

- 1.1 **Reagents:** Silver acetate, Methanol-*d*₄, Silver hexafluoro antimonate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 60 min, 120 °C; 120 °C → rt

Regioselective Synthesis of 2-Alkenylindoles and 2-Alkenyl indole-3-carboxylates through the Cascade Reactions of N-Nitrosoanilines with Propargyl Alcohols

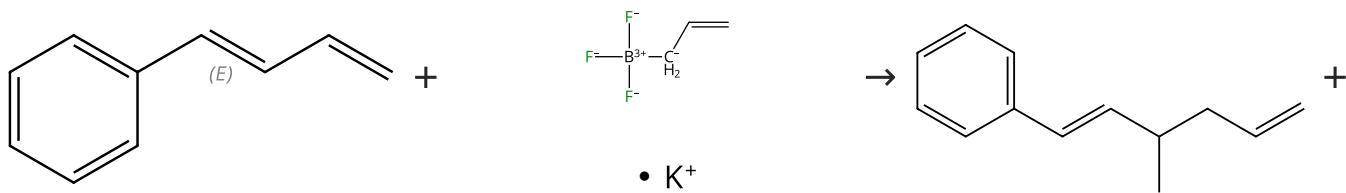
By: Song, Xia; et al

Journal of Organic Chemistry (2018), 83(15), 8509-8521.

Experimental Protocols

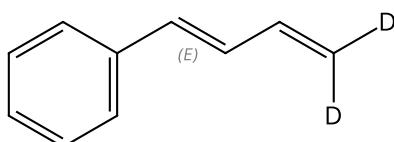
Scheme 49 (1 Reaction)

Steps: 1



Suppliers (71)

Suppliers (57)



Double bond geometry shown

31-614-CAS-27355368

Steps: 1

(CDC)-Rhodium-Catalyzed Hydroallylation of Vinylarenes and 1,3-Dienes with AllylTrifluoroborates

1.1 Reagents: Methanol-*d*₄

Catalysts: Di- μ -chlorotetrakis[(1,2- η)-cyclooctene]dirhodium, Sodium tetrakis[3,5-bis(trifluoromethyl)phenyl]borate, 1*H*-Pyrazolium, 5-[(2*S*)-2-[[bis(4-fluorophenyl)phosphino]methyl]-1-pyrrolidinyl]-3-(2,6-dimethylphenoxy)-1,2-diphenyl-, tetrafluoroborate(1-) (1:1)

Solvents: 1,2-Dichloroethane; 30 min, 22 °C

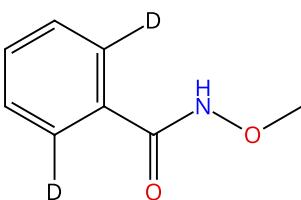
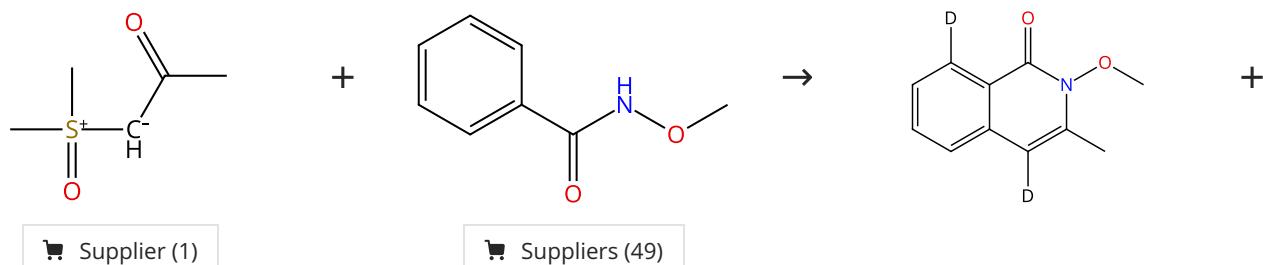
1.2 Solvents: Water; 18 h, 35 °C

By: Marcum, Justin S.; et al

ACS Catalysis (2019), 9(7), 5881-5889.

Scheme 50 (1 Reaction)

Steps: 1



31-116-CAS-18365521

Steps: 1

Rhodium(III)-catalyzed chemodivergent annulations between N-methoxybenzamides and sulfoxonium ylides via C-H activation

1.1 Reagents: Methanol-*d*₄

Catalysts: Zinc triflate, Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5- η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (*OC*-6-11)-hexafluoroantimonate(1-) (1:2)

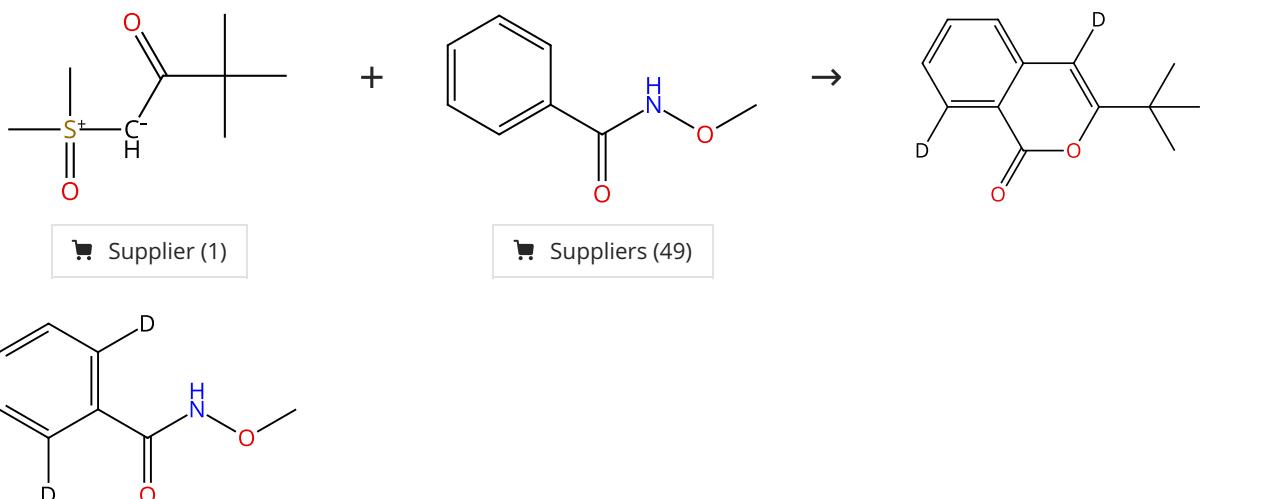
Solvents: 1,2-Dichloroethane; 30 min, 100 °C

By: Xu, Youwei; et al
Chemical Communications (Cambridge, United Kingdom) (2018), 54(6), 670-673.

Experimental Protocols

Scheme 51 (1 Reaction)

Steps: 1



31-116-CAS-18365520

Steps: 1

1.1 Reagents: Pivalic acid, Methanol-*d*₄Catalysts: Cesium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]

Solvents: 1,2-Dichloroethane; 30 min, 100 °C

Experimental Protocols

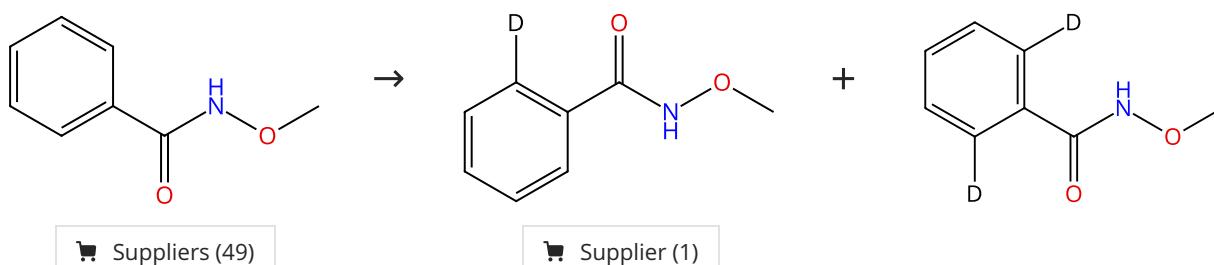
Rhodium(III)-catalyzed chemodivergent annulations between N-methoxybenzamides and sulfoxonium ylides via C-H activation

By: Xu, Youwei; et al

Chemical Communications (Cambridge, United Kingdom) (2018), 54(6), 670-673.

Scheme 52 (1 Reaction)

Steps: 1



31-116-CAS-18305320

Steps: 1

1.1 Reagents: Sodium acetate, Sodium bicarbonate

Catalysts: Rhodium(2+), tris(acetonitrile)[(1,2,3,4,5-η)-1,2,3,4,5-pentamethyl-2,4-cyclopentadien-1-yl]-, (OC-6-11)-hexafluoroantimonate(1-) (1:2)

Solvents: Methanol-*d*₄; 5 h, 60 °C

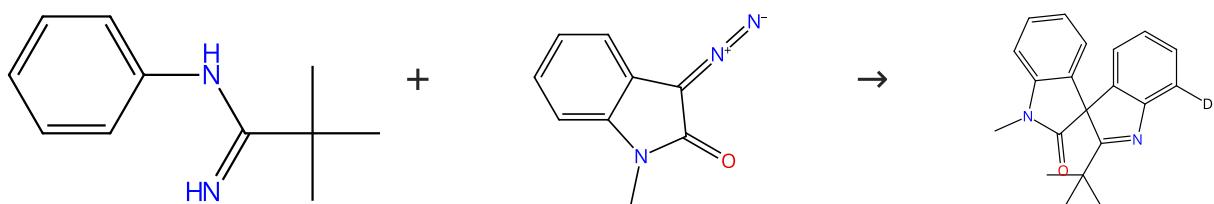
Microwave-Assisted Synthesis of Heterocycles by Rhodium(III)-Catalyzed Annulation of N-Methoxyamides with α-Chloroaldehydes

By: Huang, Ji-Rong; et al

Angewandte Chemie, International Edition (2017), 56(50), 15921-15925.

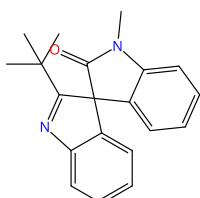
Scheme 53 (1 Reaction)

Steps: 1



Suppliers (6)

Suppliers (5)



31-116-CAS-23908826

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄, 1-Adamantanecarboxylic acid
Catalysts: Cesium acetate, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]
Solvents: 1,2-Dichloroethane; 1 h, 60 °C; 60 °C → rt
- 1.2 **Reagents:** Sodium bicarbonate
Solvents: Water; rt

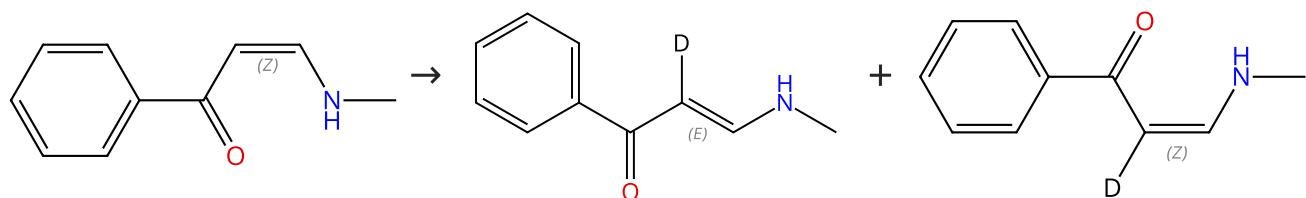
Synthesis of 3-spirooxindole 3H-indoles through Rh(III)-catalyzed [4 + 1] redox-neutral spirocyclization of N-aryl amidines with diazo oxindoles

By: Zhou, Qianting; et al

Organic Chemistry Frontiers (2021), 8(15), 4131-4137.

Scheme 54 (1 Reaction)

Steps: 1



Double bond geometry shown

Double bond geometry shown

Double bond geometry shown

Suppliers (7)

31-116-CAS-22949912

Steps: 1

An efficient method for the synthesis of 2-pyridones via C-H bond functionalization

- 1.1 **Reagents:** Silver acetate, Methanol-*d*₄
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 3 h, 90 °C

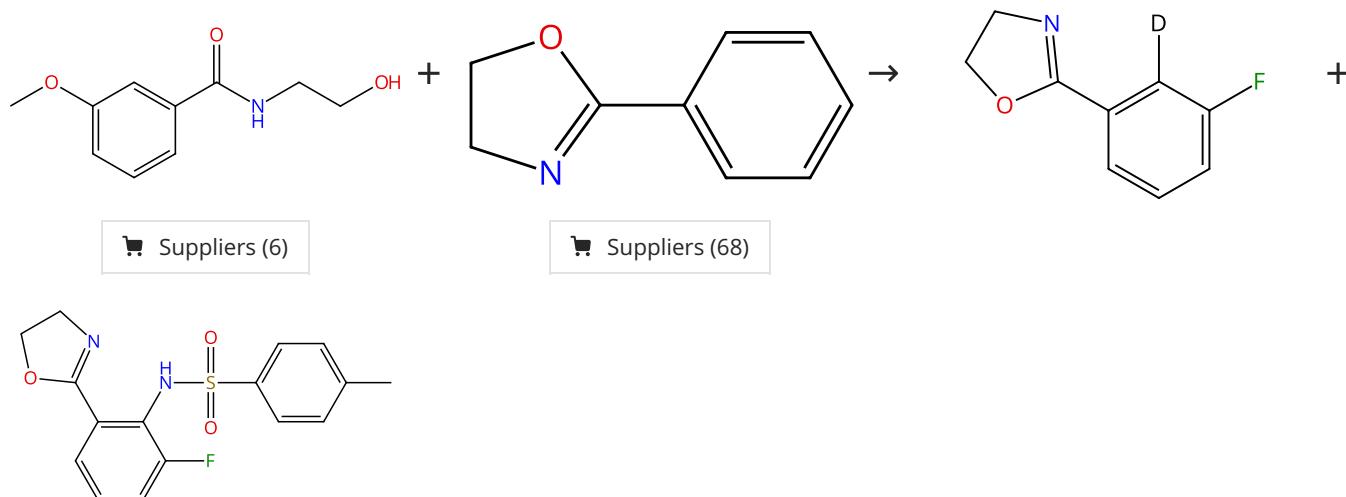
By: Zhou, Shuguang; et al

Chemical Communications (Cambridge, United Kingdom) (2020), 56(95), 15020-15023.

Experimental Protocols

Scheme 55 (1 Reaction)

Steps: 1



31-080-CAS-16343367

Steps: 1

- 1.1 **Reagents:** Methanol-*d*₄, Iodobenzene diacetate
Catalysts: Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Dichloromethane; 1 h, 100 °C

Experimental Protocols

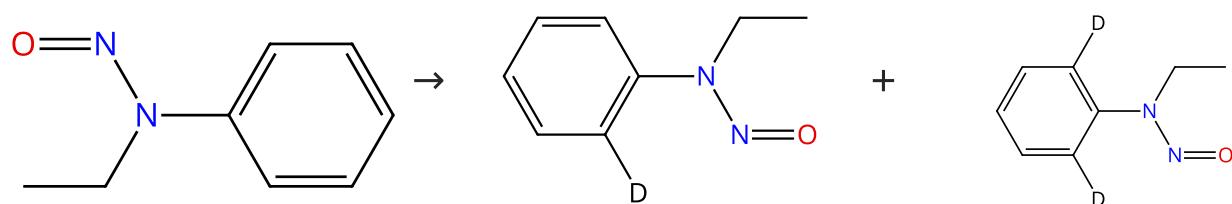
Oxazoline-Promoted Rh-Catalyzed C-H Amidation of Benzene Derivatives with Sulfonamides and Trifluoroacetamide. A Comparative Study

By: Maiden, Tracy M. M.; et al

Journal of Organic Chemistry (2016), 81(22), 10641-10650.

Scheme 56 (1 Reaction)

Steps: 1



31-116-CAS-14783418

Steps: 1

- 1.1 **Catalysts:** Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Acetonitrile; 10 min
 1.2 **Reagents:** *tert*-Butyl alcohol-*d*₁
Solvents: Acetonitrile-*d*₃, Water-*d*₂; 16 h, 80 °C

Experimental Protocols

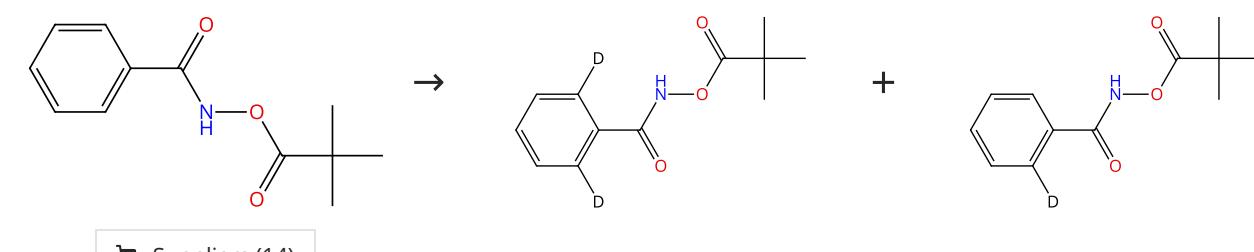
Rhodium(III)-Catalyzed Indole Synthesis Using N-N Bond as an Internal Oxidant

By: Liu, Baoqing; et al

Journal of the American Chemical Society (2013), 135(44), 16625-16631.

Scheme 57 (1 Reaction)

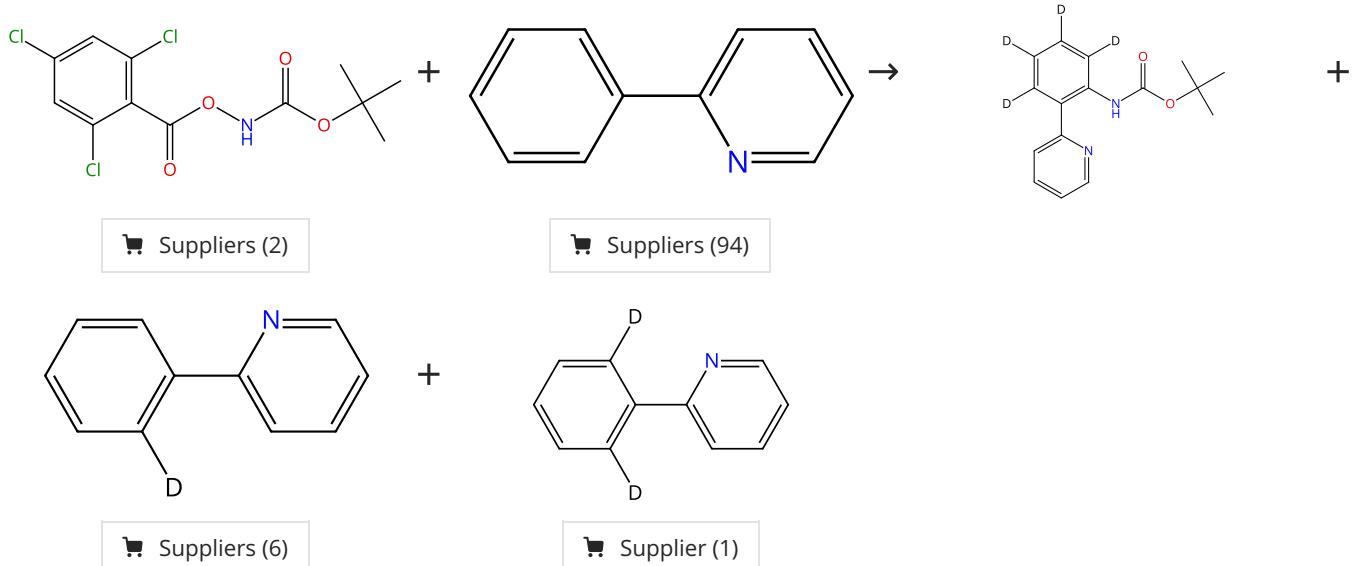
Steps: 1



31-614-CAS-34094793	Steps: 1	Rh(III)-Catalyzed C-H Activation/Annulation of Benzohydrazoxamates and 2-Imidazolones: Access to Urea-Fused-Dihydroisoquinolone Scaffolds Reminiscent of Pyrrole Alkaloid Natural Products By: Hubbell, Grace E.; et al Organic Letters (2022), 24(37), 6740-6744.
1.1 Reagents: Cesium acetate, 1-Acetyl-1,3-dihydro-2 <i>H</i> -imidazol-2-one, 2,2,2-Trifluoroethanol- <i>d</i> Catalysts: Bis[dichloro[η ⁵ -(pentamethylcyclopentadienyl)]rhodium]; < 2 min, rt; rt → 45 °C; 30 min, 45 °C		

Scheme 58 (1 Reaction)

Steps: 1 Yield: 96%



31-080-CAS-1018776	Steps: 1 Yield: 96%	Rh[III]-Catalyzed C-H Amidation Using Aroyloxycarbamates To Give N-Boc Protected Arylamines By: Grohmann, Christoph; et al Organic Letters (2013), 15(12), 3014-3017.
1.1 Reagents: Potassium acetate Catalysts: Bis[dichloro[n ⁵ -(pentamethylcyclopentadienyl)] rhodium], Silver hexafluoroantimonate Solvents: Methanol- <i>d</i> ; 10 min, 60 °C		
Experimental Protocols		

Scheme 59 (1 Reaction)

Steps: 1 Yield: 80%

Steps: 1 Yield: 96%

Rh^{III}-Catalyzed C-H Amidation Using Aroyloxycarbamates To Give N-Boc Protected Arylamines

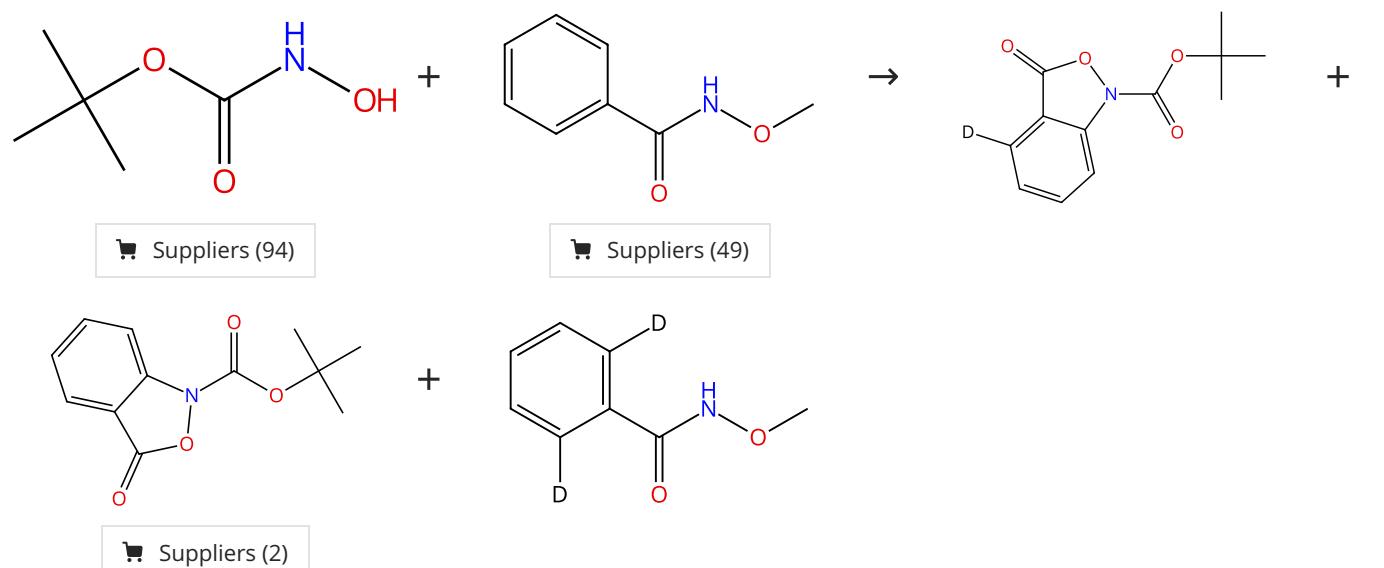
By: Grohmann, Christoph; et al

Organic Letters (2013), 15(12), 3014-3017.

Experimental Protocols

Scheme 59 (1 Reaction)

Steps: 1 Yield: 80%



31-116-CAS-6120806

Steps: 1 Yield: 80%

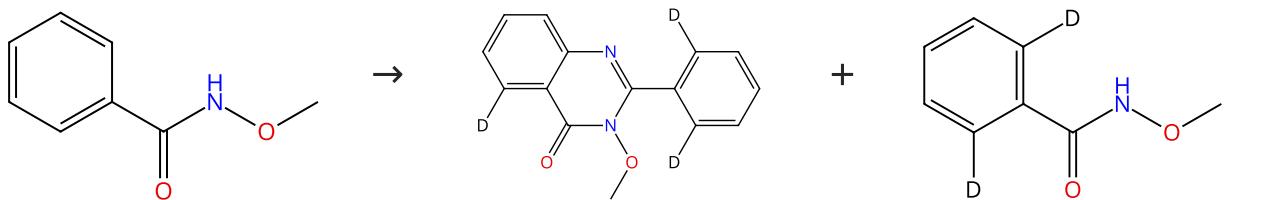
1.1 Reagents: Pivalic acid, Acetone-d₆, Methanol-d₄, Oxygen
Catalysts: Cesium acetate, Cuprous chloride, Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium]; 15 h, rt

Experimental Protocols

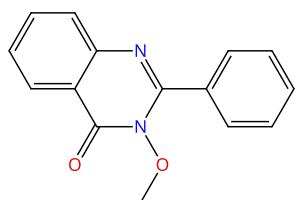
Hydroxyamination of aryl C-H bonds with N-hydroxycarbamate by synergistic Rh/Cu catalysis at room temperature
 By: Yang, Wei; et al
 Chemical Communications (Cambridge, United Kingdom) (2014), 50(34), 4420-4422.

Scheme 60 (1 Reaction)

Steps: 1 Yield: 36%



Suppliers (49)



Supplier (1)

31-116-CAS-20768824

Steps: 1 Yield: 36%

1.1 Reagents: Potassium bicarbonate, Methanol-d₄
Catalysts: Boric acid (H₃BO₃), Bis[dichloro[η⁵-(pentamethylcyclopentadienyl)]rhodium], Silver hexafluoroantimonate
Solvents: Dichloromethane; 12 h, 90 °C

Experimental Protocols

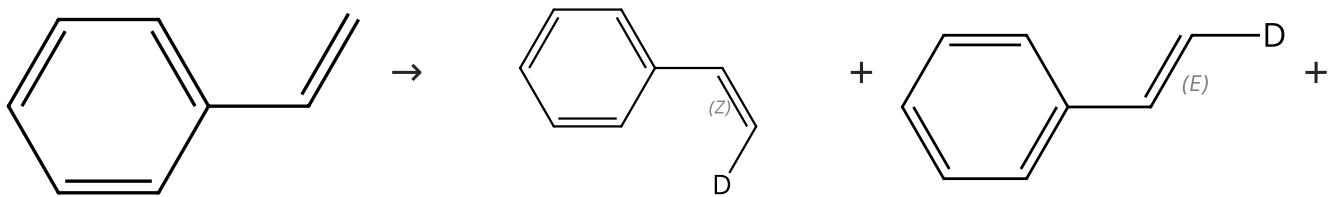
N-Methoxyamide: An Alternative Amidation Reagent in the Rhodium(III)-Catalyzed C-H Activation

By: Zhou, Chao; et al

Organic Letters (2019), 21(23), 9315-9319.

Scheme 61 (1 Reaction)

Steps: 1



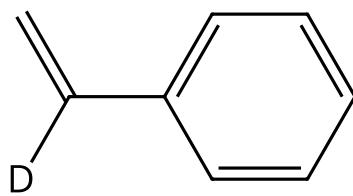
Suppliers (122)

Double bond geometry shown

Suppliers (13)

Double bond geometry shown

Suppliers (10)



Suppliers (24)

31-614-CAS-24175232	Steps: 1	Heterogeneous Isomerization for Stereoselective Alkyne Hydrogenation to trans-Alkene Mediated by Frustrated Hydrogen Atoms By: Zhang, Weijie; et al Journal of the American Chemical Society (2021), 143(38), 15882-15890.
1.1 Catalysts: Rhodium sulfide Solvents: Methanol- <i>d</i> ₄ ; 1 h, rt		
1.2 Reagents: Hydrogen; 1 bar, 60 °C		

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