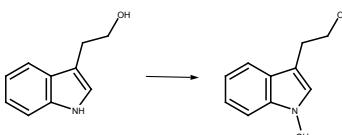
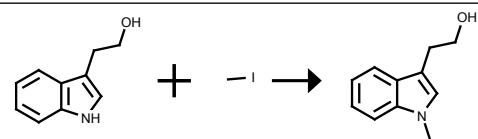


Query

	Query	Results	Date
1. Query	 Search as: As drawn, No salts, No mixtures	32 reactions in Reaxys	2017-11-15 17h:33m:36s (EST)


 Rx-ID: 11068666 [View in Reaxys](#) 1/32

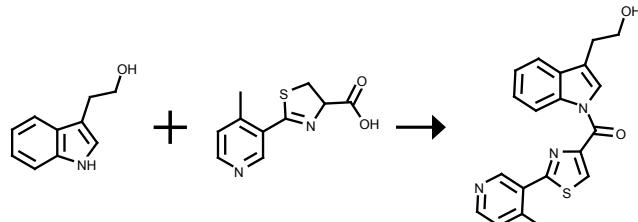
Yield	Conditions & References
96 %	<p>Stage 1: With sodium hydride in N,N-dimethyl-formamide, Time= 45h, T= 0 °C Stage 2: in N,N-dimethyl-formamide, T= 0 - 20 °C</p> <p>DiPoto, Maria C.; Hughes, Russell P.; Wu, Jimmy; Journal of the American Chemical Society; vol. 137; nb. 47; (2015); p. 14861 - 14864 View in Reaxys</p>
93 %	<p>With potassium hydroxide, tetra(n-butyl)ammonium hydrogensulfate in dichloromethane, water, Time= 14h</p> <p>Lopez-Alvarado, Pilar; Steinhoff, Judith; Miranda, Sonia; Avendano, Carmen; Carlos Menendez; Tetrahedron; vol. 65; nb. 8; (2009); p. 1660 - 1672 View in Reaxys</p>
93 %	<p>Generalprocedure for 1-methyltryptophol (1a) To a solution of tryptophol (1.5 g, 9.3 mmol) in CH₂Cl₂ (25 mL) was added tetrabutylammonium bisulfate (TBAHS) (278 mg, 0.83 mmol). To this mixture, 50percent aqueous solution of KOH (1.2 mL) was added and the biphasic system was vigorously stirred for 5 min. Methyl iodide (1.57 g, 11.16 mmol) was added and the stirring was continued for 12 h. The reaction mixture was poured into a saturated aqueous NH₄Cl solution and the resulting mixture was extracted with CH₂Cl₂ (3×30 mL).The combined organic layers were dried over Na₂SO₄ and concentrated in vacuo and the residue was purified by column chromatography on silica gel,eluting with CH₂Cl₂, to yield 1.51 g (93percent) of 1-methyltryptophol (1a);</p> <p>Stage 1: With tetra(n-butyl)ammonium hydrogensulfate, potassium hydroxide in dichloromethane, water, Time= 0.083333h Stage 2: in dichloromethane, water, Time= 12h</p> <p>Reddy, B.V. Subba; Kota, Kavya; Rao, B. Maheshwar; Sridhar; Mukkanti; Tetrahedron Letters; vol. 57; nb. 41; (2016); p. 4529 - 4532 View in Reaxys</p>
	<p>With sodium hydride in N,N-dimethyl-formamide, Time= 3h, T= 20 °C</p> <p>Ferrer, Catalina; Amijs, Catelijne H. M.; Echavarren, Antonio M.; Chemistry - A European Journal; vol. 13; nb. 5; (2007); p. 1358 - 1373 View in Reaxys</p>
	<p>11 : PREPARATION 11 PREPARATION 11 To a solution of sodium amide from 0.63 g sodium in 50 ml liquid ammonia is added in dropwise fashion a solution of 3.22 g of 3-(2-hydroxyethyl)indole in 10 ml diethyl ether. After stirring 10 minutes a solution of 1.37 ml methyl iodide in 1.5 ml diethyl ether is added in one portion. The mixture is stirred for 15 minutes and then the ammonia is allowed to evaporate. The residue is mixed with 100 ml water and is extracted into 200 ml diethyl ether. The organic phase is separated and is dried over magnesium sulfate. Filtration and evaporation affords 3.64 g of 1-methyl-3-(2-hydroxyethyl)indole, an oil.</p> <p>With sodium in diethyl ether, ammonia</p> <p>Patent: Syntex (U.S.A.) Inc.; US4255432; (1981); (A1) English View in Reaxys</p>
	<p>With tetrabutylammomium bromide, potassium hydroxide in dichloromethane, water, Time= 5h, T= -20 °C</p> <p>Jafarpour, Farnaz; Hazrati, Hamideh; Advanced Synthesis and Catalysis; vol. 352; nb. 2-3; (2010); p. 363 - 367 View in Reaxys</p>
	<p>Stage 1: With potassium hydroxide in dimethyl sulfoxide, Time= 0.5h, Inert atmosphere</p>

Stage 2: in dimethyl sulfoxide, Time= 2h, T= 20 °C , Inert atmosphere

Trost, Barry M.; Zhang, Yong; Chemistry - A European Journal; **vol.** 17; nb. 10; (2011); p. 2916 - 2922
[View in Reaxys](#)

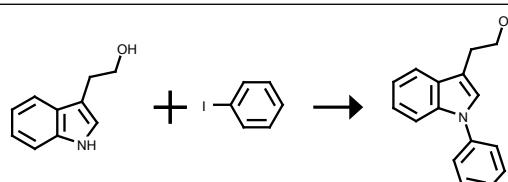
With tetra(n-butyl)ammonium hydrogensulfate in dichloromethane

Subba Reddy; Anji Babu; Jagan Mohan Reddy; Sridhar; Ramalinga Murthy; Pranathi; Kalivendi, Shasi V.; Prabhakar Rao; RSC Advances; **vol.** 5; nb. 35; (2015); p. 27476 - 27480
[View in Reaxys](#)



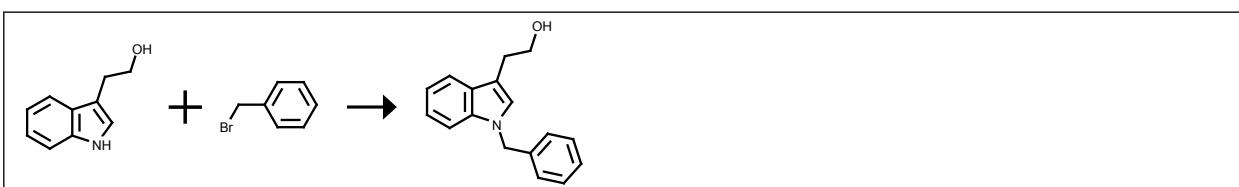
Rx-ID: 45958739 [View in Reaxys](#) 2/32

Yield	Conditions & References
74 %	<p>2 : Synthesis of parabenothiazole amide General procedure: Weigh the compound pyridine dihydroxy thiophene carboxylic acid A (0.2 mmol) in a 25 mL round bottom flask was added dichloromethane (8 mL) as a solvent. Under ice-cooling, 0.14 mL of thionyl chloride was slowly added dropwise, the ice bath was removed, reacted at room temperature for 18 hours. Evaporated to dryness under reduced pressure, and 15 mL of methylene chloride was added thereto. Triethylamine (2.5 eq) was added dropwise to the reaction solution at 0 °C. The syringe was further added dropwise with an amine (1.1 eq) and the ice bath was removed and allowed to react for 16 h at room temperature until the feed was completely lost. The reaction was quenched by adding 20 mL of saturated aqueous NaHC03 solution to the reaction system, extracted with 3 x 15 mL of dichloromethane, washed with 25 mL of saturated NaCl solution, dried over anhydrous Na2SO4, filtered and the dichloromethane was distilled off, washed with DCM: MeOH = 40: 1 ~ 10: 1 or PE: EA = 5: 1 ~ 3: 1, the target product B is obtained.</p> <p>Stage 1: With thionyl chloride in dichloromethane, Time= 18h, T= 20 °C , Cooling with ice Stage 2: With triethylamine in dichloromethane, Time= 16h, T= 0 - 20 °C</p> <p>Patent: Yunnan University; Zhao Jingfeng; Li Liang; Wan Runfang; Yang Jiaqiong; Wei Le; Liu Kai; Zhang Hongbin; Yang Xiaodong; (8 pag.); CN106632301; (2017); (A) Chinese View in Reaxys</p>

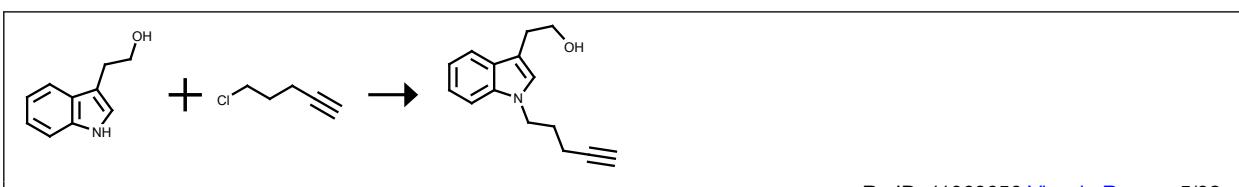


Rx-ID: 9123822 [View in Reaxys](#) 3/32

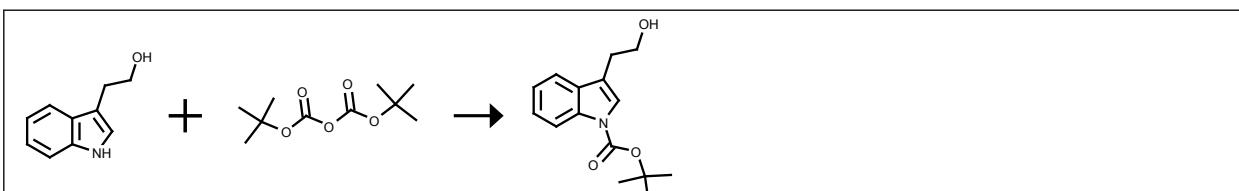
Yield	Conditions & References
90 %	<p>With potassium phosphate, copper(I) iodide, cis-N,N'-dimethyl-1,2-diaminocyclohexane in toluene, Time= 24h, T= 110 °C</p> <p>Antilla, Jon C.; Klapars, Artis; Buchwald, Stephen L.; Journal of the American Chemical Society; vol. 124; nb. 39; (2002); p. 11684 - 11688 View in Reaxys</p>


 Rx-ID: 41491233 [View in Reaxys](#) 4/32

Yield	Conditions & References
71 %	Stage 1: With sodium hydride in N,N-dimethyl-formamide, Time= 0.75h, T= 0 °C Stage 2: in N,N-dimethyl-formamide, T= 0 - 20 °C DiPoto, Maria C.; Hughes, Russell P.; Wu, Jimmy; Journal of the American Chemical Society; vol. 137 ; nb. 47; (2015); p. 14861 - 14864 View in Reaxys


 Rx-ID: 11068656 [View in Reaxys](#) 5/32

Yield	Conditions & References
88 %	With sodium hydride in N,N-dimethyl-formamide, Time= 16h, T= 20 °C Ferrer, Catalina; Amijs, Catelijne H. M.; Echavarren, Antonio M.; Chemistry - A European Journal; vol. 13 ; nb. 5; (2007); p. 1358 - 1373 View in Reaxys


 Rx-ID: 28602419 [View in Reaxys](#) 6/32

Yield	Conditions & References
	14 :3-(2-Hydroxy-ethyl)-indole-1-carboxylic acid tert-butyl ester was prepared as follows: To a solution of tryptophol (200mg, 1.25mmol) in DCM (5ml) were added di- tert-butyldicarbonate (1.5equiv, 410mg) and dimethylaminopyridine (0.05equiv, 8mg) and the reaction mixture was stirred at room temperature overnight. DCM/brine extraction afforded 3-(2-hydroxy-ethyl)-indole-1-carboxylic acid tert-butyl ester as an oil (348mg). With 4-(N,N-dimethylamino)pyridine in dichloromethane, T= 20 °C Patent: F. HOFFMANN-LA ROCHE AG; GENENTECH, INC.; WO2009/66084; (2009); (A1) English View in Reaxys


 Rx-ID: 20295011 [View in Reaxys](#) 7/32

Yield	Conditions & References
	Reaction Steps: 3 1: 96 percent / pyridine / CH ₂ Cl ₂ / 2.5 h / kept in the dark 2: 75 percent / 4-(dimethylamino)pyridine / acetonitrile / 15 h / Ambient temperature

3: 77 percent / 20 percent methanol-acetonitrile / 0.08 h / Irradiation
With pyridine, methanol, dmap **in** dichloromethane, acetonitrile

Beck, Anthony L.; Mascal, Mark; Moody, Christopher J.; Coates, William J.; Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999); nb. 7; (1992); p. 813 - 822

[View in Reaxys](#)

Reaction Steps: 3

1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C

2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C

2.2: 20 °C

3.1: tetrabutyl ammonium fluoride / 24 h

With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride **in** tetrahydrofuran, N,N-dimethyl-formamide, mineral oil

Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; **vol. 50;** nb. 10; (2014); p. 1231 - 1233

[View in Reaxys](#)

Reaction Steps: 3

1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C / Inert atmosphere

2.1: sodium hydride / tetrahydrofuran / 1.25 h / 0 - 20 °C / Inert atmosphere

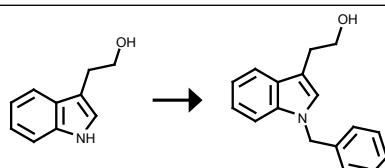
2.2: 0 - 20 °C

3.1: tetrabutyl ammonium fluoride / tetrahydrofuran / 24 h / 20 °C / Inert atmosphere

With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride **in** tetrahydrofuran, N,N-dimethyl-formamide

Xu, Jun; Tong, Rongbiao; Green Chemistry; **vol. 19;** nb. 13; (2017); p. 2952 - 2956

[View in Reaxys](#)

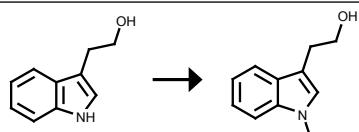


Rx-ID: 17878721 [View in Reaxys](#) 8/32

Yield	Conditions & References
	<p>Reaction Steps: 3</p> <p>1: 100 percent / pyridine, DMAP / CH_2Cl_2 / 24 h / Ambient temperature</p> <p>2: 50 percent / NaH / 1,2-dimethoxy-ethane / 1.) r.t., 30 min, 2.) 1 h</p> <p>3: 96 percent / NaOMe / methanol / 0.17 h / Ambient temperature; i18</p> <p>With pyridine, dmap, sodium methylate, sodium hydride in methanol, DME, dichloromethane</p> <p>Novak, Lajos; Hornyszky, Gabor; Rohaly, Janos; Kolanits, Pal; Szantay, Csaba; Liebigs Annalen; nb. 10; (1995); p. 1877 - 1884</p> <p>View in Reaxys</p>
	<p>Reaction Steps: 3</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>3.1: tetrabutyl ammonium fluoride / 24 h</p> <p>With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233</p> <p>View in Reaxys</p>
	<p>Reaction Steps: 3</p> <p>1: 1H-imidazole / N,N-dimethyl-formamide / 0 - 20 °C</p> <p>2: sodium hydride / N,N-dimethyl-formamide</p> <p>3: tetrabutyl ammonium fluoride / tetrahydrofuran</p>

With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride **in** tetrahydrofuran, N,N-dimethyl-formamide
Subba Reddy; Anji Babu; Jagan Mohan Reddy; Sridhar; Ramalinga Murthy; Pranathi; Kalivendi, Shasi V.; Prabhakar Rao; RSC Advances; **vol.** 5; nb. 35; (2015); p. 27476 - 27480
[View in Reaxys](#)

Reaction Steps: 3
 1.1: 1H-imidazole / N,N-dimethyl-formamide / 16 h / 25 °C / |Cooling
 2.1: sodium hydride / N,N-dimethyl-formamide / 0.5 h / 0 - 25 °C
 2.2: 0.75 h / 0 - 20 °C
 3.1: tetrabutyl ammonium fluoride / tetrahydrofuran / 24 h
With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride **in** tetrahydrofuran, N,N-dimethyl-formamide
Reddy, B.V. Subba; Kota, Kavya; Rao, B. Maheshwar; Sridhar; Mukkanti; Tetrahedron Letters; **vol.** 57; nb. 41; (2016); p. 4529 - 4532
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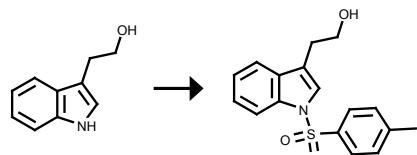
Rx-ID: 19442508 [View in Reaxys](#) 9/32

Yield	Conditions & References
	<p>Reaction Steps: 3 1: 55.3 g / AnalalR pyridine / 1 h / Ambient temperature 2: 58.2 g / sodium hydride / tetrahydrofuran / 1.) reflux, 5 min, 2.) room temperature, 0.5 h 3: 38.0 g / KOH, H₂O / methanol / 1 h With pyridine, potassium hydroxide, water, sodium hydride in tetrahydrofuran, methanol Leeson, Paul D.; Journal of the Chemical Society, Perkin Transactions 1: Organic and Bio-Organic Chemistry (1972-1999); (1984); p. 2125 - 2128 View in Reaxys</p>
	<p>Reaction Steps: 3 1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C / Inert atmosphere 2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C / Inert atmosphere 2.2: 0 - 20 °C / Inert atmosphere 3.1: hydrogenchloride; lithium hydroxide monohydrate / tetrahydrofuran; mineral oil / 0.5 h With 1H-imidazole, hydrogenchloride, lithium hydroxide monohydrate, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil Liu, Chuan; Zhang, Wei; Dai, Li-Xin; You, Shu-Li; Organic and Biomolecular Chemistry; vol. 10; nb. 35; (2012); p. 7177 - 7183 View in Reaxys</p>
	<p>Reaction Steps: 3 1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C 2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C 2.2: 20 °C 3.1: tetrabutyl ammonium fluoride / 24 h With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>
	<p>Reaction Steps: 3 1: 1H-imidazole; triethylamine / dichloromethane 2: sodium hydride / N,N-dimethyl-formamide / 2 h / 20 °C 3: tetrabutyl ammonium fluoride / tetrahydrofuran / 2 h / 20 °C</p>

With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride, triethylamine **in** tetrahydrofuran, dichloromethane, N,N-dimethyl-formamide

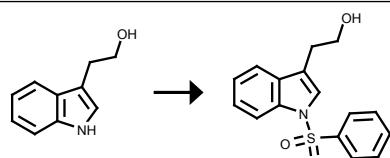
Cheng, Jianjun; Qin, Jihong; Guo, Sihua; Qiu, Hangdeng; Zhong, Yun; Bioorganic and Medicinal Chemistry Letters; **vol.** 24; nb. 19; (2014); p. 4768 - 4772

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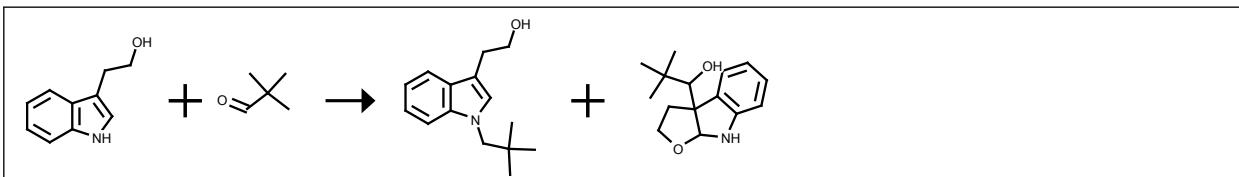
Rx-ID: 16387332 [View in Reaxys](#) 10/32

Yield	Conditions & References
	<p>Reaction Steps: 3</p> <p>1: 18 g / Et₃N, DMAP / CH₂Cl₂ / 12 h</p> <p>2: 9.5 g / n-Bu₄NHSO₄, NaOH / toluene / 18 h</p> <p>3: 6.2 g / n-Bu₄NF / tetrahydrofuran / 4 h / 0 °C</p> <p>With dmap, sodium hydroxide, tetrabutyl ammonium fluoride, tetra(n-butyl)ammonium hydrogensulfate, triethylamine in tetrahydrofuran, dichloromethane, toluene</p> <p>Bergmeier, Stephen C.; Seth, Punit P.; Journal of Organic Chemistry; vol. 64; nb. 9; (1999); p. 3237 - 3243 View in Reaxys</p>
	<p>Reaction Steps: 3</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C / Inert atmosphere</p> <p>2.1: sodium hydride / tetrahydrofuran / 1.25 h / 0 - 20 °C / Inert atmosphere</p> <p>2.2: 0 - 20 °C</p> <p>3.1: tetrabutyl ammonium fluoride / tetrahydrofuran / 24 h / 20 °C / Inert atmosphere</p> <p>With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide</p> <p>Xu, Jun; Tong, Rongbiao; Green Chemistry; vol. 19; nb. 13; (2017); p. 2952 - 2956 View in Reaxys</p>

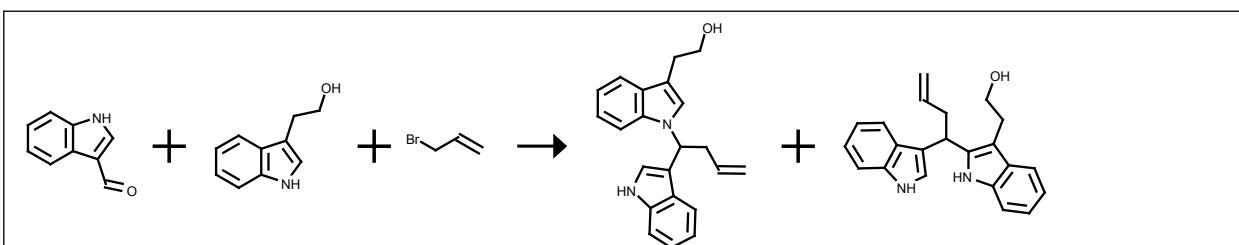


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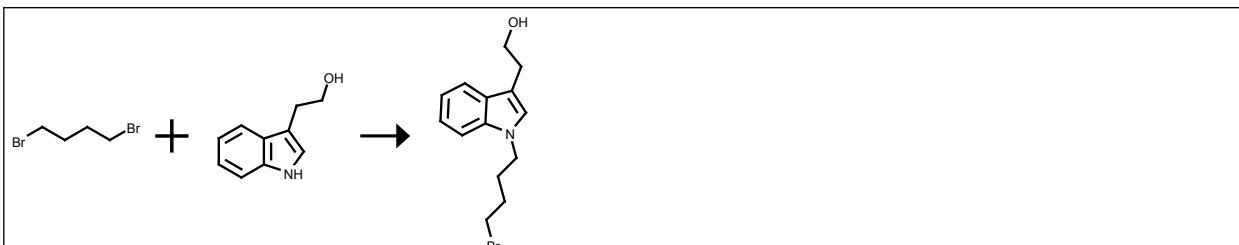
Yield	Conditions & References
	<p>Reaction Steps: 3</p> <p>1: 99 percent / imidazole / dimethylformamide / 16 h / Ambient temperature</p> <p>2: 1.) NaH / 1.) DMF, RT, 30 min, 2.) DMF, RT, 16 h</p> <p>3: 84 percent / tetrabutylammonium fluoride / tetrahydrofuran / 16 h / Ambient temperature</p> <p>With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide</p> <p>Hirschmann, Ralph; Nicolaou; Pietranico, Sherrie; Leahy, Ellen M.; Salvino, Joseph; Arison, Byron; Cichy, Maria A.; Grant Spoores; Shakespeare, William C.; Sprengeler, Paul A.; Hamley, Peter; Smith III, Amos B.; Reissine, Terry; Raynor, Karen; Maechler, Laurie; Donaldson, Cindy; Vale, Wylie; Freidinger, Roger M.; Cascieri, Margaret R.; Strader, Catherine D.; Journal of the American Chemical Society; vol. 115; nb. 26; (1993); p. 12550 - 12568 View in Reaxys</p>


Rx-ID: 9868922 [View in Reaxys](#) 12/32

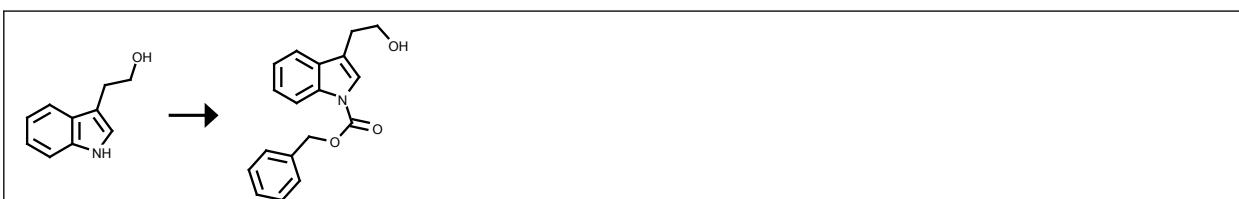
Yield	Conditions & References
22 %, 29 %	Stage 1: With toluene-4-sulfonic acid in benzene, Time= 0.166667h, T= 95 °C Stage 2: With Bromcresol green, sodium cyanoborohydride in methanol, Time= 2h, T= 20 °C Hirose, Tomoyasu; Sunazuka, Toshiaki; Yamamoto, Daisuke; Kojima, Naoto; Shirahata, Tatsuya; Harigaya, Yoshihiro; Kuwajima, Isao; Omura, Satoshi; Tetrahedron; vol. 61; nb. 25; (2005); p. 6015 - 6039 View in Reaxys


Rx-ID: 28201328 [View in Reaxys](#) 13/32

Yield	Conditions & References
40 %, 31 %	With indium in tetrahydrofuran, water, Time= 8h, T= 50 °C Colombo, Francesca; Cravotto, Giancarlo; Palmisano, Giovanni; Penoni, Andrea; Sisti, Massimo; European Journal of Organic Chemistry; nb. 16; (2008); p. 2801 - 2807 View in Reaxys


Rx-ID: 40271112 [View in Reaxys](#) 14/32

Yield	Conditions & References
19 %	With sodium hydride in N,N-dimethyl-formamide, T= 110 °C , Inert atmosphere Xie, Fang; Kniess, Torsten; Neuber, Christin; Deuther-Conrad, Winnie; Mamat, Constantin; Lieberman, Brian P.; Liu, Boli; Mach, Robert H.; Brust, Peter; Steinbach, Jörg; Pietzsch, Jens; Jia, Hongmei; MedChemComm; vol. 6; nb. 6; (2015); p. 1093 - 1103 View in Reaxys

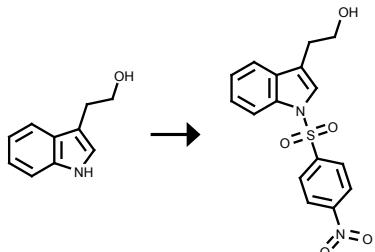

Rx-ID: 45794749 [View in Reaxys](#) 15/32

Yield	Conditions & References
	Reaction Steps: 3

1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C / Inert atmosphere
 2.1: sodium hydride / tetrahydrofuran / 1.25 h / 0 - 20 °C / Inert atmosphere
 2.2: 0 - 20 °C
 3.1: tetrabutyl ammonium fluoride / tetrahydrofuran / 24 h / 20 °C / Inert atmosphere
With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride **in** tetrahydrofuran, N,N-dimethyl-formamide

Xu, Jun; Tong, Rongbiao; Green Chemistry; **vol.** 19; **nb.** 13; (2017); p. 2952 - 2956

[View in Reaxys](#)

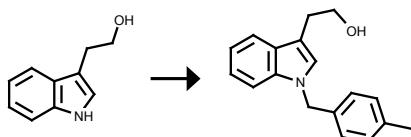


Rx-ID: 45794750 [View in Reaxys](#) 16/32

Yield	Conditions & References
	Reaction Steps: 3 1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C / Inert atmosphere 2.1: sodium hydride / tetrahydrofuran / 1.25 h / 0 - 20 °C / Inert atmosphere 2.2: 0 - 20 °C 3.1: tetrabutyl ammonium fluoride / tetrahydrofuran / 24 h / 20 °C / Inert atmosphere With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide

Xu, Jun; Tong, Rongbiao; Green Chemistry; **vol.** 19; **nb.** 13; (2017); p. 2952 - 2956

[View in Reaxys](#)

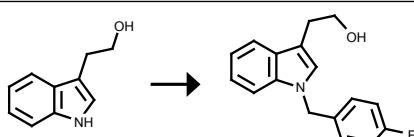


Rx-ID: 37078218 [View in Reaxys](#) 17/32

Yield	Conditions & References
	Reaction Steps: 2 1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C 2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C 2.2: 20 °C With 1H-imidazole, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil

Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; **vol.** 50; **nb.** 10; (2014); p. 1231 - 1233

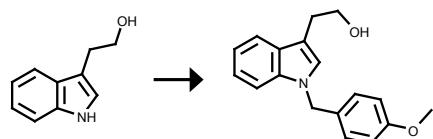
[View in Reaxys](#)



Rx-ID: 37078219 [View in Reaxys](#) 18/32

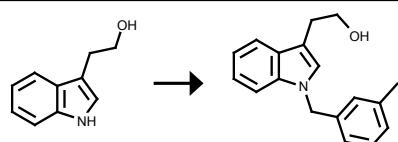
Yield	Conditions & References
	Reaction Steps: 2 1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C 2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C 2.2: 20 °C With 1H-imidazole, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil

Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233
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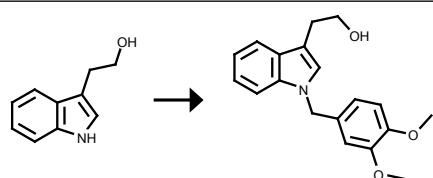
Rx-ID: 37078220 [View in Reaxys](#) 19/32

Yield	Conditions & References
	<p>Reaction Steps: 2</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>With 1H-imidazole, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>



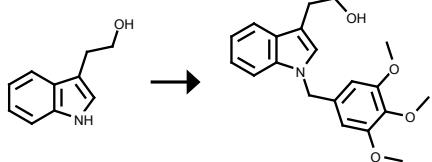
Rx-ID: 37078221 [View in Reaxys](#) 20/32

Yield	Conditions & References
	<p>Reaction Steps: 2</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>With 1H-imidazole, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>



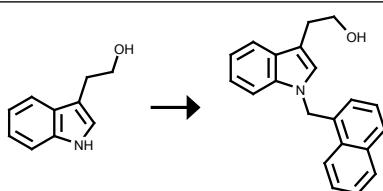
Rx-ID: 37078222 [View in Reaxys](#) 21/32

Yield	Conditions & References
	<p>Reaction Steps: 2</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>With 1H-imidazole, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>



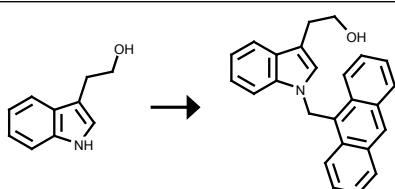
Rx-ID: 37078223 [View in Reaxys](#) 22/32

Yield	Conditions & References
	<p>Reaction Steps: 2</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>With 1H-imidazole, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>



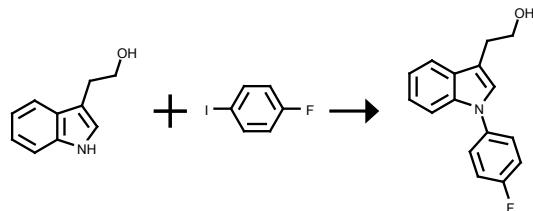
Rx-ID: 37078227 [View in Reaxys](#) 23/32

Yield	Conditions & References
	<p>Reaction Steps: 3</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>3.1: tetrabutyl ammonium fluoride / 24 h</p> <p>With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>



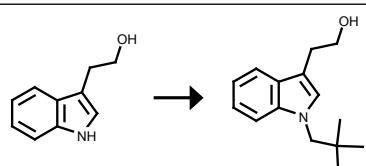
Rx-ID: 37078230 [View in Reaxys](#) 24/32

Yield	Conditions & References
	<p>Reaction Steps: 3</p> <p>1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C</p> <p>2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C</p> <p>2.2: 20 °C</p> <p>3.1: tetrabutyl ammonium fluoride / 24 h</p> <p>With 1H-imidazole, tetrabutyl ammonium fluoride, sodium hydride in tetrahydrofuran, N,N-dimethyl-formamide, mineral oil</p> <p>Han, Long; Liu, Chuan; Zhang, Wei; Shi, Xiao-Xin; You, Shu-Li; Chemical Communications; vol. 50; nb. 10; (2014); p. 1231 - 1233 View in Reaxys</p>



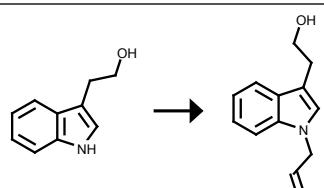
Rx-ID: 4245446 [View in Reaxys](#) 25/32

Yield	Conditions & References
	With 1-methyl-pyrrolidin-2-one, copper(I) iodide, potassium carbonate, zinc oxide, Time= 6h, T= 155 °C Perregaard; Moltzen; Meier; Sanchez; Journal of Medicinal Chemistry; vol. 38; nb. 11; (1995); p. 1998 - 2008 View in Reaxys



Rx-ID: 13167248 [View in Reaxys](#) 26/32

Yield	Conditions & References
	Reaction Steps: 2 1: 55 percent / Ti(O-i-Pr)4; t-BuOOH; (+)-diisopropyl tartrate / CH ₂ Cl ₂ ; decane / 1.5 h / -40 °C 2: 80 percent / AcONa; AcOH; NaBH ₃ CN / ethanol / 0.83 h / 0 °C With titanium(IV) isopropylate, tert.-butylhydroperoxide, L-(+)-DIPT, sodium acetate, sodium cyanoborohydride, acetic acid in decane, ethanol, dichloromethane, 1: Sharpless epoxidation Hirose, Tomoyasu; Sunazuka, Toshiaki; Yamamoto, Daisuke; Kojima, Naoto; Shirahata, Tatsuya; Harigaya, Yoshihiro; Kuwajima, Isao; Omura, Satoshi; Tetrahedron; vol. 61; nb. 25; (2005); p. 6015 - 6039 View in Reaxys
	Reaction Steps: 3 1.1: 100 percent / NaBH ₃ CN; acetic acid / 3.5 h / 0 - 20 °C 2.1: TiCl ₄ ; PPh ₃ / benzene; toluene / 1 h / 0 °C 2.2: 89 percent / NaBH ₃ CN / methanol; benzene; toluene / 1 h 3.1: 99 percent / MnO ₂ / CH ₂ Cl ₂ / 2 h / 20 °C / sonicating With manganese(IV) oxide, titanium tetrachloride, sodium cyanoborohydride, acetic acid, triphenylphosphine in dichloromethane, toluene, benzene Hirose, Tomoyasu; Sunazuka, Toshiaki; Yamamoto, Daisuke; Kojima, Naoto; Shirahata, Tatsuya; Harigaya, Yoshihiro; Kuwajima, Isao; Omura, Satoshi; Tetrahedron; vol. 61; nb. 25; (2005); p. 6015 - 6039 View in Reaxys



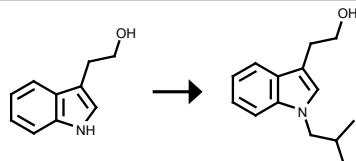
Rx-ID: 33844607 [View in Reaxys](#) 27/32

Yield	Conditions & References
	Reaction Steps: 3 1.1: 1H-imidazole / N,N-dimethyl-formamide / 3 h / 0 - 20 °C / Inert atmosphere 2.1: sodium hydride / tetrahydrofuran; mineral oil / 1.25 h / 0 - 20 °C / Inert atmosphere 2.2: 0 - 20 °C / Inert atmosphere 3.1: hydrogenchloride; lithium hydroxide monohydrate / tetrahydrofuran; mineral oil / 0.5 h

With 1H-imidazole, hydrogenchloride, lithium hydroxide monohydrate, sodium hydride **in** tetrahydrofuran, N,N-di-methyl-formamide, mineral oil

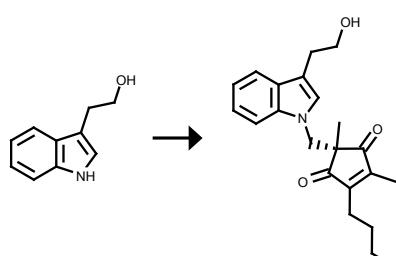
Liu, Chuan; Zhang, Wei; Dai, Li-Xin; You, Shu-Li; Organic and Biomolecular Chemistry; **vol.** 10; nb. 35; (2012); p. 7177 - 7183

[View in Reaxys](#)



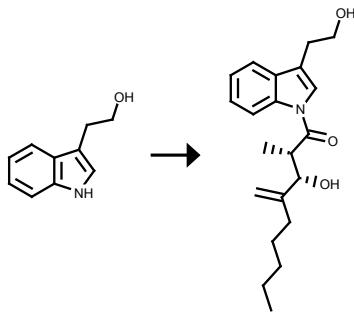
Rx-ID: 13167246 [View in Reaxys](#) 28/32

Yield	Conditions & References
	<p>Reaction Steps: 2</p> <p>1: 55 percent / Ti(O-i-Pr)4; t-BuOOH; (+)-diisopropyl tartrate / CH₂Cl₂; decane / 1.5 h / -40 °C</p> <p>2: 26 percent / AcONa; AcOH; NaBH₃CN / ethanol / 0.83 h / 0 °C</p> <p>With titanium(IV) isopropylate, tert.-butylhydroperoxide, L-(+)-DIPT, sodium acetate, sodium cyanoborohydride, acetic acid in decane, ethanol, dichloromethane, 1: Sharpless epoxidation</p> <p>Hirose, Tomoyasu; Sunazuka, Toshiaki; Yamamoto, Daisuke; Kojima, Naoto; Shirahata, Tatsuya; Harigaya, Yoshihiro; Kuwajima, Isao; Omura, Satoshi; Tetrahedron; vol. 61; nb. 25; (2005); p. 6015 - 6039</p> <p>View in Reaxys</p>

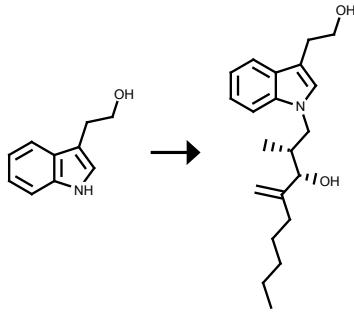


Rx-ID: 13167258 [View in Reaxys](#) 29/32

Yield	Conditions & References
	<p>Reaction Steps: 7</p> <p>1.1: 100 percent / NaBH₃CN; acetic acid / 3.5 h / 0 - 20 °C</p> <p>2.1: 89 percent / DMAP; triethylamine / CH₂Cl₂ / 2.33 h</p> <p>3.1: TiCl₄ / benzene; toluene / 0.25 h / 20 °C</p> <p>3.2: 51.7 mg / NaBH₃CN / benzene; toluene; methanol / 0.17 h / 20 °C</p> <p>4.1: 100 percent / tetra-n-butylammonium fluoride / tetrahydrofuran / 4 h / 60 °C</p> <p>5.1: 78 percent / DMAP; Et₃N / CH₂Cl₂ / 2.5 h / 20 °C</p> <p>6.1: MnO₂ / CH₂Cl₂ / 32 h / 20 °C / sonication</p> <p>7.1: 62.8 mg / HCl / ethanol / 0.08 h / 0 °C</p> <p>With hydrogenchloride, 4-(N,N-dimethylamino)pyridine, manganese(IV) oxide, tetrabutyl ammonium fluoride, titanium tetrachloride, sodium cyanoborohydride, acetic acid, triethylamine in tetrahydrofuran, ethanol, dichloromethane, toluene, benzene</p> <p>Hirose, Tomoyasu; Sunazuka, Toshiaki; Yamamoto, Daisuke; Kojima, Naoto; Shirahata, Tatsuya; Harigaya, Yoshihiro; Kuwajima, Isao; Omura, Satoshi; Tetrahedron; vol. 61; nb. 25; (2005); p. 6015 - 6039</p> <p>View in Reaxys</p>


Rx-ID: 42198942 [View in Reaxys](#) 30/32

Yield	Conditions & References
	<p>Reaction Steps: 5</p> <p>1.1: acetic acid; sodium cyanoborohydride / 3.5 h / 0 - 20 °C / Inert atmosphere</p> <p>2.1: 1H-imidazole / dichloromethane / 0.17 h / 0 °C / Inert atmosphere</p> <p>2.2: 3 h / 20 °C / Inert atmosphere</p> <p>3.1: N-ethyl-N,N-diisopropylamine; N-[(dimethylamino)-3-oxo-1H-1,2,3-triazolo[4,5-b]pyridin-1-yl-methylene]-N-methylmethanaminium hexafluorophosphate / N,N-dimethyl-formamide / 20 °C / Inert atmosphere</p> <p>4.1: 2,3-dicyano-5,6-dichloro-p-benzoquinone / benzene / 20 °C / Inert atmosphere; Reflux</p> <p>5.1: toluene-4-sulfonic acid / methanol / 2 h / 20 °C / Inert atmosphere</p> <p>With 1H-imidazole, sodium cyanoborohydride, toluene-4-sulfonic acid, acetic acid, N-ethyl-N,N-diisopropylamine, 2,3-dicyano-5,6-dichloro-p-benzoquinone, N-[(dimethylamino)-3-oxo-1H-1,2,3-triazolo[4,5-b]pyridin-1-yl-methylene]-N-methylmethanaminium hexafluorophosphate in methanol, dichloromethane, N,N-dimethyl-formamide, benzene</p> <p>Singh, Sarbjit; Gajulapati, Veeraswamy; Gajulapati, Kondaji; Goo, Ja-II; Park, Yeon-Hwa; Jung, Hwa Young; Lee, Sung Yoon; Choi, Jung Ho; Kim, Young Kook; Lee, Kyeong; Heo, Tae-Hwe; Choi, Yongseok; Bioorganic and Medicinal Chemistry Letters; vol. 26; nb. 4; (2016); p. 1282 - 1286</p> <p>View in Reaxys</p>


Rx-ID: 42198945 [View in Reaxys](#) 31/32

Yield	Conditions & References
	<p>Reaction Steps: 6</p> <p>1.1: acetic acid; sodium cyanoborohydride / 3.5 h / 0 - 20 °C / Inert atmosphere</p> <p>2.1: 1H-imidazole / dichloromethane / 0.17 h / 0 °C / Inert atmosphere</p> <p>2.2: 3 h / 20 °C / Inert atmosphere</p> <p>3.1: N-ethyl-N,N-diisopropylamine; N-[(dimethylamino)-3-oxo-1H-1,2,3-triazolo[4,5-b]pyridin-1-yl-methylene]-N-methylmethanaminium hexafluorophosphate / N,N-dimethyl-formamide / 20 °C / Inert atmosphere</p> <p>4.1: dimethylsulfide borane complex / tetrahydrofuran / 2 h / 0 - 20 °C / Inert atmosphere</p> <p>5.1: 2,3-dicyano-5,6-dichloro-p-benzoquinone / benzene / 20 °C / Inert atmosphere; Reflux</p> <p>6.1: tetrabutyl ammonium fluoride / tetrahydrofuran / 2 h / 0 - 20 °C / Inert atmosphere</p> <p>With 1H-imidazole, dimethylsulfide borane complex, tetrabutyl ammonium fluoride, sodium cyanoborohydride, acetic acid, N-ethyl-N,N-diisopropylamine, 2,3-dicyano-5,6-dichloro-p-benzoquinone, N-[(dimethylamino)-3-oxo-1H-1,2,3-triazolo[4,5-b]pyridin-1-yl-methylene]-N-methylmethanaminium hexafluorophosphate in tetrahydrofuran, dichloromethane, N,N-dimethyl-formamide, benzene</p>

Singh, Sarbjit; Gajulapati, Veeraswamy; Gajulapati, Kondaji; Goo, Ja-II; Park, Yeon-Hwa; Jung, Hwa Young; Lee, Sung Yoon; Choi, Jung Ho; Kim, Young Kook; Lee, Kyeong; Heo, Tae-Hwe; Choi, Yongseok; Bioorganic and Medicinal Chemistry Letters; vol. 26; nb. 4; (2016); p. 1282 - 1286
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