Paths of analysis*

Y7A

Synthia

October 10, 2022

1 Analysis parameters

Analysis type: Automatic Retrosynthesis

Rules: none selected

Filters: Exclude Diastereoselecitve reactions, Tunnels, FGI, FGI with protections

Max. paths returned: 50

Max. iterations: 2000

Commercial:

1. Max. molecular weight - 1000 g/mol
2. Max. price - 1500 $/g

Published:

1. Max. molecular weight - 1000 g/mol
2. Popularity - 5

My Stockroom:

1. Max. molecular weight - 1000 g/mol

Reaction scoring formula: TUNNEL_COEF*FGI_COEF*STEP*20+1000000*(CONFLICT+NON_SELECTIVITY+FILTERS+PROTECT)

Chemical scoring formula: SMALLER^ 3,SMALLER^ 1.5

Min. search width: 400

Max. reactions per product: 60

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Strategies: none selected

FGI Coeff: 0

Tunnels Coeff: 0

JSON Parameters: {}

2 Paths

1 path found. *Paths are sorted by score. Reactions are sorted in appearance order for each path.*

2.1 Path 1

Score: `1000212.97`

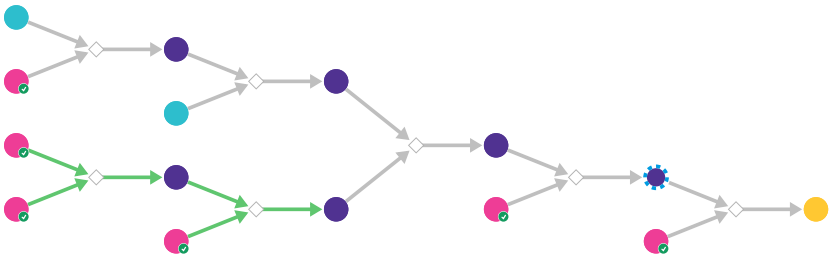
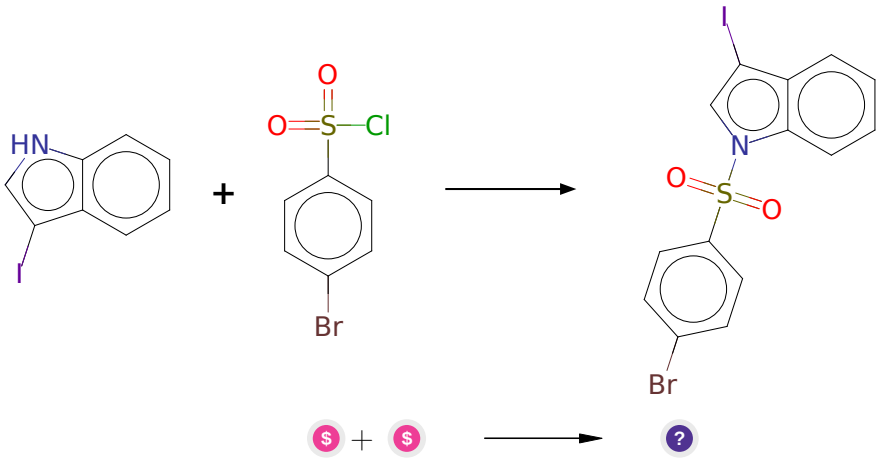


Figure 1: Outline of path 1

2.1.1 Sulfonylation of N-Heterocycles



Substrates:

1. 3-jod-indol - *available at Sigma-Aldrich*
2. 4-Bromobenzenesulfonyl chloride - *available at Sigma-Aldrich*

Products:

1. O=S(=O)(c1ccc(Br)cc1)n1cc(I)c2ccccc21

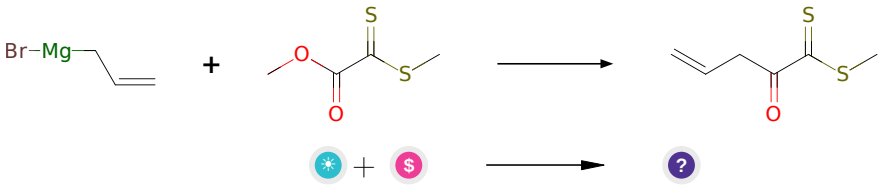
Typical conditions: NaH.DMF

Protections: none

Reference: *10.1021/ol0478133* (SI) AND *10.1002/anie.200352634* AND *10.1021/ja973656+*

Retrosynthesis ID: 14719

2.1.2 Synthesis of ketones from esters via Grignard addition



Substrates:

1. dimethyl-1,1-dithiooxalat
2. Allylmagnesium bromide solution - *available at Sigma-Aldrich*

Products:

1. C=CCC(=O)C(=S)SC

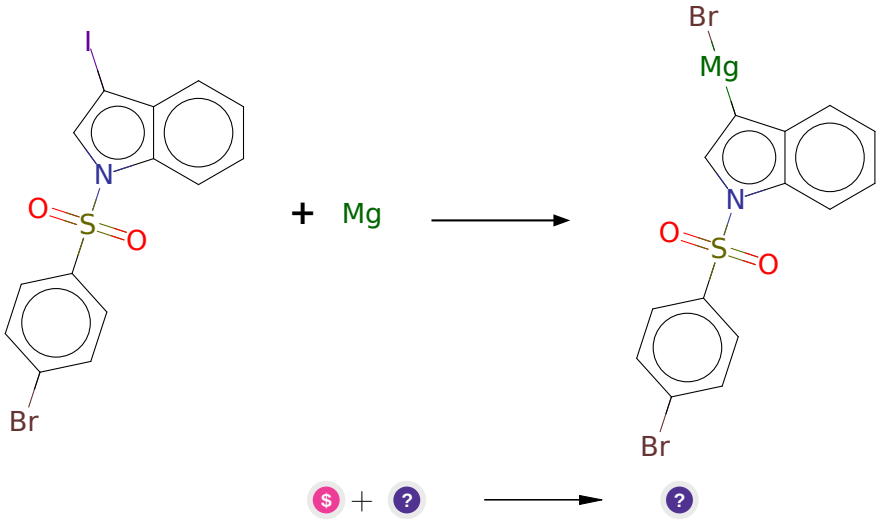
Typical conditions: THF. Low temp

Protections: none

Reference: *10.1021/jm800136b* and *10.1021/ol402802g*

Retrosynthesis ID: 10011836

2.1.3 Synthesis of aryl Grignard reagents



Substrates:

1. Magnesium - *available at Sigma-Aldrich*
2. O=S(=O)(c1ccc(Br)cc1)n1cc(I)c2ccccc21

Products:

1. O=S(=O)(c1ccc(Br)cc1)n1cc([Mg]Br)c2ccccc21

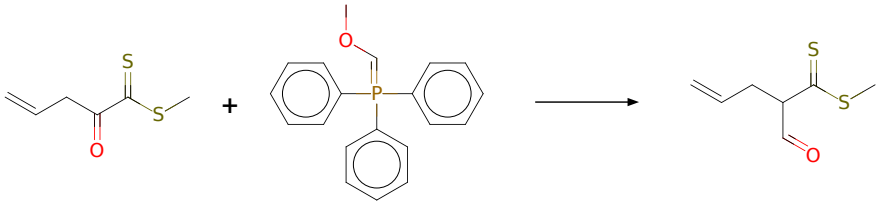
Typical conditions: iPrMgCl.LiCl.THF or other conditions Mg.THF or tBuLi.MgBr2

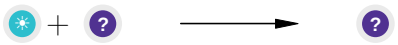
Protections: none

Reference: DOI: *10.1016/S0040-4039(99)01404-5* and *10.1021/jo0000574* and WO2014123793 p.137 and *10.1021/jm400491x* and *10.3762/bjoc.12.36*

Retrosynthesis ID: 10011460

2.1.4 Olefination of ketones followed by hydrolysis





Substrates:

1. triphenylphosphonium methoxymethylide
2. C=CCC(=O)C(=S)SC

Products:

1. C=CCC(C=O)C(=S)SC

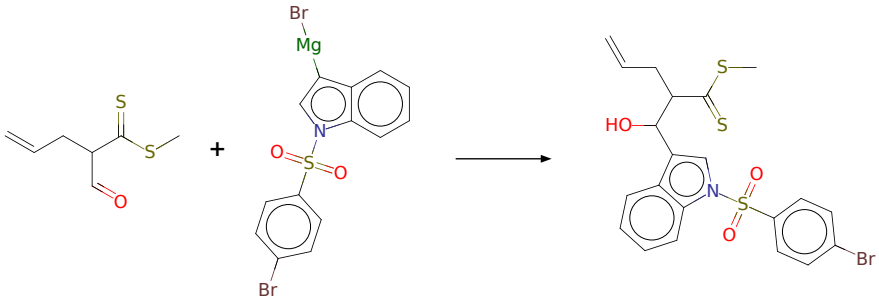
Typical conditions: KHMDS.THF hydrolysis: pTsOH.water.acetone

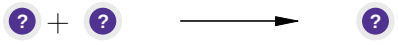
Protections: none

Reference: *10.1002/anie.201811403* and *10.1002/anie.201809130* and *10.1002/anie.201705809* and *10.1002/anie.201409038* and *10.1021/ol3028994* (SI)

Retrosynthesis ID: 31014861

2.1.5 Grignard-Type Reaction





Substrates:

1. C=CCC(C=O)C(=S)SC
2. O=S(=O)(c1ccc(Br)cc1)n1cc([Mg]Br)c2ccccc21

Products:

1. C=CCC(C(=S)SC)C(O)c1cn(S(=O)(=O)c2ccc(Br)cc2)c2ccccc12

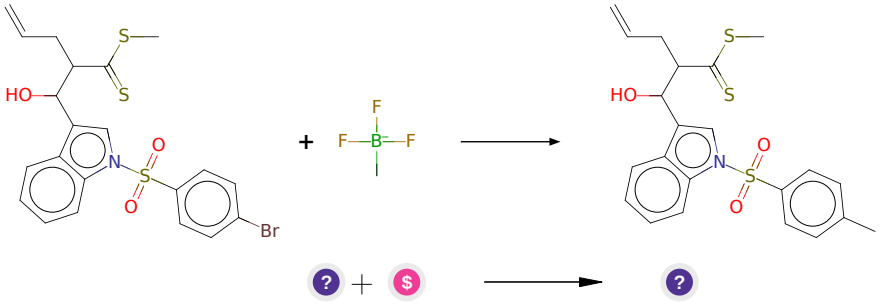
Typical conditions: Mg or Li.ether

Protections: none

Reference: *10.1055/s-0030-1260809* or *10.1021/jm061429p* or *10.1021/jo0621423* or *10.1021/ja00373a036* or *10.1016/S0040-4020(01)00457-4*

Retrosynthesis ID: 25123

2.1.6 Suzuki Coupling of arylbromides and methyltrifluoroborates



Substrates:

1. C=CCC(C(=S)SC)C(O)c1cn(S(=O)(=O)c2ccc(Br)cc2)c2ccccc12
2. Potassium methyltrifluoroborate - *available at Sigma-Aldrich*

Products:

1. C=CCC(C(=S)SC)C(O)c1cn(S(=O)(=O)c2ccc(C)cc2)c2ccccc12

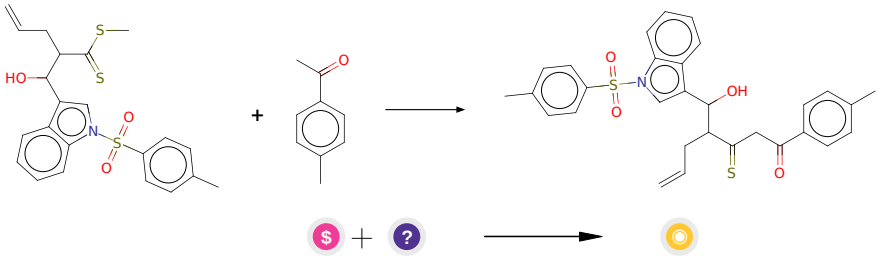
Typical conditions: Pd(dppf)2Cl2.Cs2CO3.THF/H2O.110C

Protections: none

Reference: *10.1021/jo0343331* and US2010168094 and WO201769980A1 p.00383-00384 and *10.1002/ejoc.201100119* and WO200816669 col.55

Retrosynthesis ID: 10033480

2.1.7 Condensation of ketones with dithioesters



Substrates:

1. Methyl p-tolyl ketone - *available at Sigma-Aldrich*
2. C=CCC(C(=S)SC)C(O)c1cn(S(=O)(=O)c2ccc(C)cc2)c2ccccc12

Products:

1. C=CCC(C(=S)CC(=O)c1ccc(C)cc1)C(O)c1cn(S(=O)(=O)c2ccc(C)cc2)c2ccccc12

Typical conditions: NaH.DMF

Protections:

Functional group SMARTS	Classification	Protecting groups
[#6][CH]([#6])[OH]	alcohols	Methoxymethyl Ether (MOM) 2-Methoxyethoxymethyl Ether (MEM) Tetrahydropyranyl Ether (THP) Benzyl Ether (PMB) t-Butyldimethylsilyl Ether (TBDMS) Methyl Ether

Reference: *10.1021/jo400599e* and *10.1002/ejoc.201301667*

Retrosynthesis ID: 9996413