Paths of analysis*

Analysis 3

Synthia

March 3, 2022

1 Analysis parameters

Analysis type: Automatic Retrosynthesis

Rules: none selected

Filters: FGI, FGI with protections

Max. paths returned: 5

Max. iterations: 300

Commercial:

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

Published:

1. Max. molecular weight - 1000 g/mol
2. Popularity - 10

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

Strategies: none selected

FGI 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: 313.21

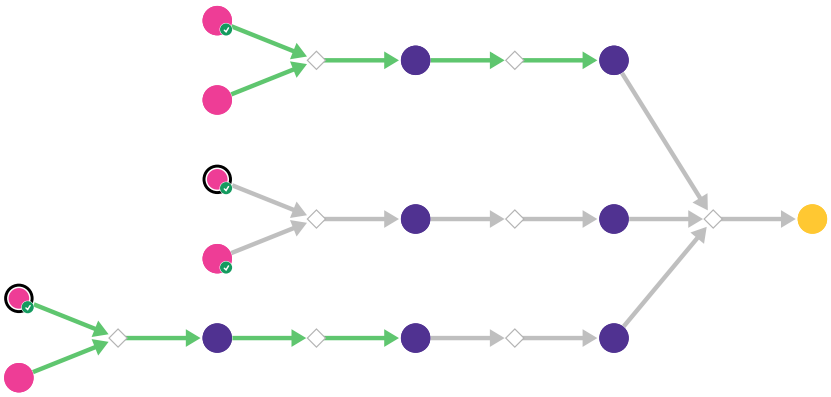
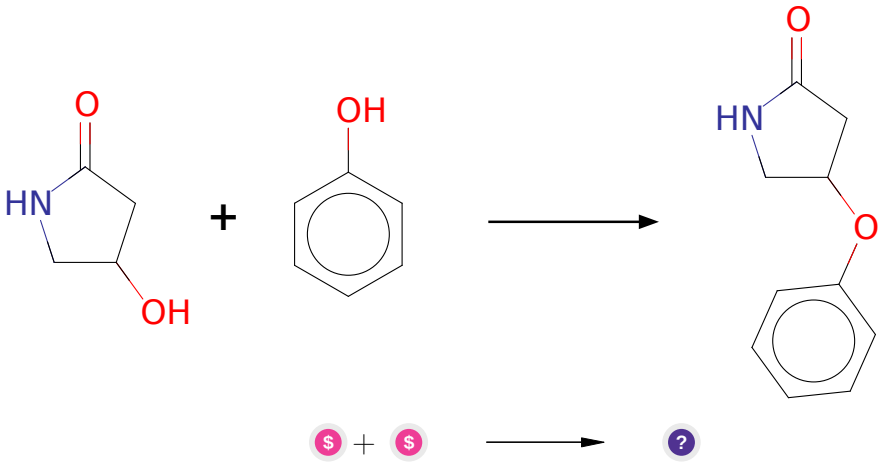


Figure 1: Outline of path 1

2.1.1 Mitsunobu reaction



Substrates:

1. C6H6O - *available at Sigma-Aldrich*
2. 4-hydroxypyrrolidin-2-one - *Combi-Blocks*

Products:

1. O=C1CC(Oc2ccccc2)CN1

Typical conditions: DEAD.or.DCAD.or.DIAD.PPh3

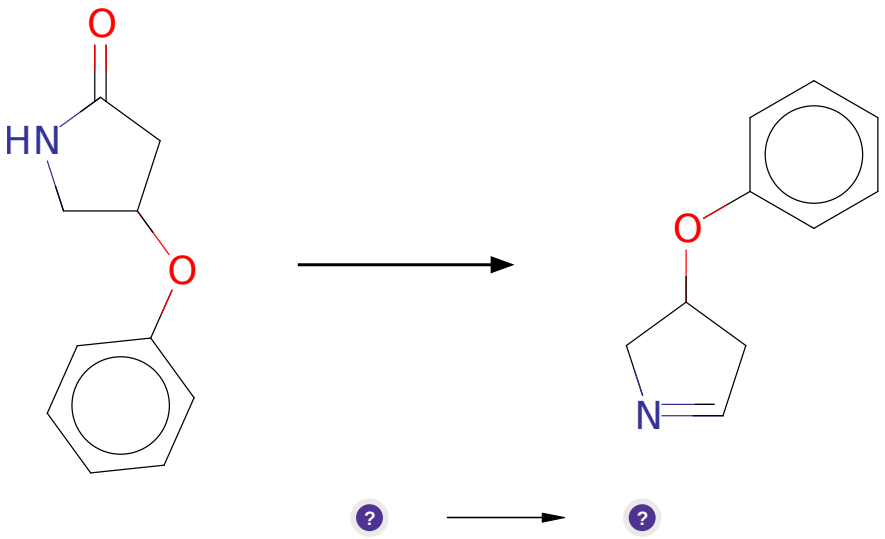
Protections: none

Yield: good

Reference: DOI: *10.1021/jo0345751* AND *10.1021/ol0618757*

Retrosynthesis ID: 7562

2.1.2 Mild reduction of secondary amides to imines



Substrates:

1. O=C1CC(Oc2ccccc2)CN1

Products:

1. C1=NCC(Oc2ccccc2)C1

Typical conditions: Tf2O.2-FPyr.Et3SiH.DCM

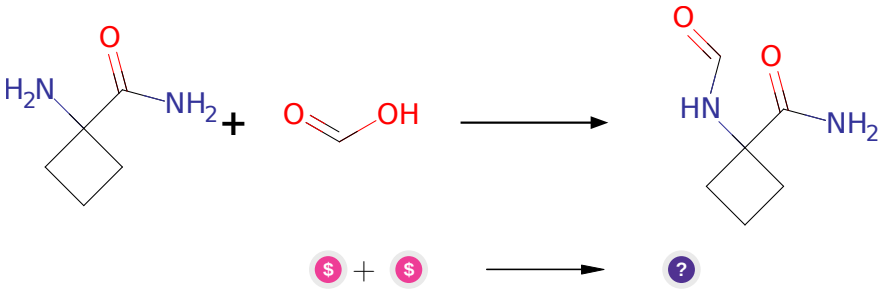
Protections: none

Yield: moderate

Reference: DOI: *10.1021/ja105194s*

Retrosynthesis ID: 1629

2.1.3 amine formylation



Substrates:

1. Formic acid - *available at Sigma-Aldrich*
2. 1-aminocyclobutane-1-carboxamide - *available at Sigma-Aldrich*

Products:

1. NC(=O)C1(NC=O)CCC1

Typical conditions: HEU(zeolite).RT.no solvent

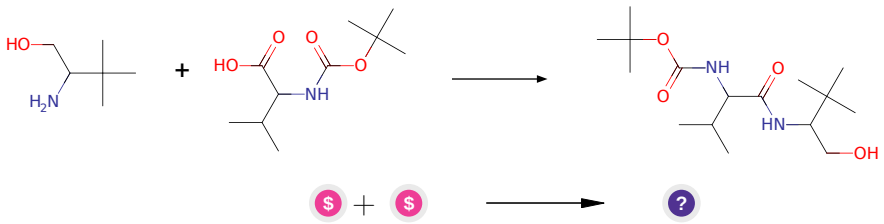
Protections: none

Yield: good

Reference: *10.5012/bkcs.2012.33.7.2251*

Retrosynthesis ID: 6000040

2.1.4 Amide coupling



Substrates:

1. Boc-DL-Val-OH - *available at Sigma-Aldrich*

2. 2-Amino-3,3-dimethyl-butan-1-ol - *Enamine*

Products:

1. CC(C)C(NC(=O)OC(C)(C)C)C(=O)NC(CO)C(C)(C)C

Typical conditions: DCC.DCM or EDC.DCM or SOCl2.DCM

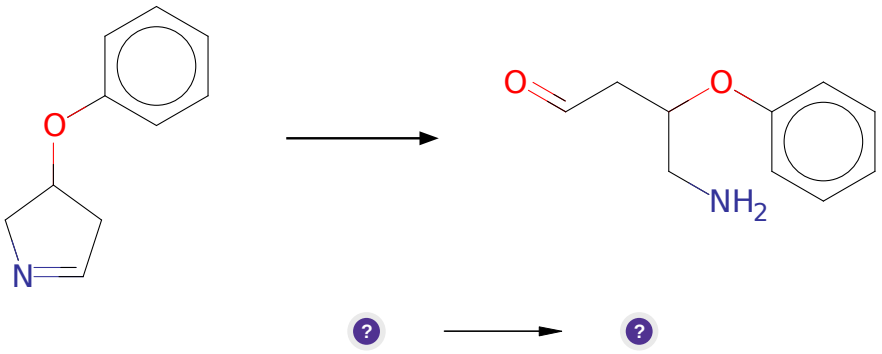
Protections: none

Yield: good

Reference: *10.1021/cr100048w* and *10.1039/B701677H* and *10.1039/C5RA24527C* and *10.3727/000000006783981206* and *10.1021/np060007f* and *10.1021/jo00012a058* and *10.1016/j.bmcl.2007.08.037* and *10.1039/C0OB00355G* and *10.1021/jm500031w* (p.3056) and *10.1016/j.tet.2011.03.046*

Retrosynthesis ID: 10087

2.1.5 Hydrolysis of cyclic imines



Substrates:

1. C1=NCC(Oc2ccccc2)C1

Products:

1. NCC(CC=O)Oc1ccccc1

Typical conditions: NaOH.H2O

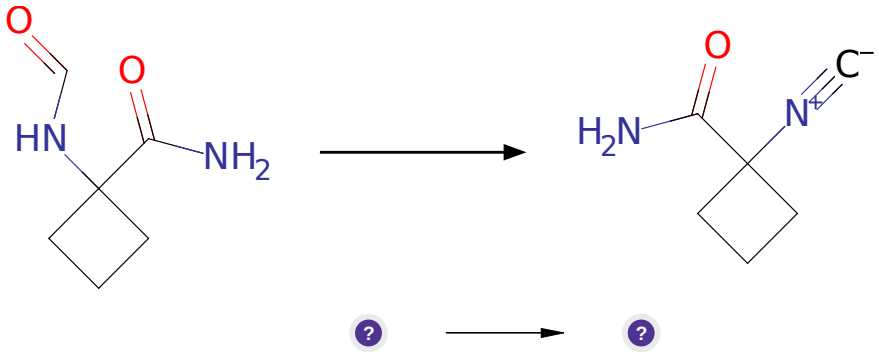
Protections: none

Yield: good

Reference: *10.1016/S0040-4020(96)00946-5* and *10.1002/ange.19891011019* and *10.1055/s-0028-1083183*

Retrosynthesis ID: 23678

2.1.6 Synthesis of isocyanides from formamides



Substrates:

1. NC(=O)C1(NC=O)CCC1

Products:

1. [C-]#[N+]C1(C(N)=O)CCC1

Typical conditions: TCT.DCM.TEA.MW.50-100C

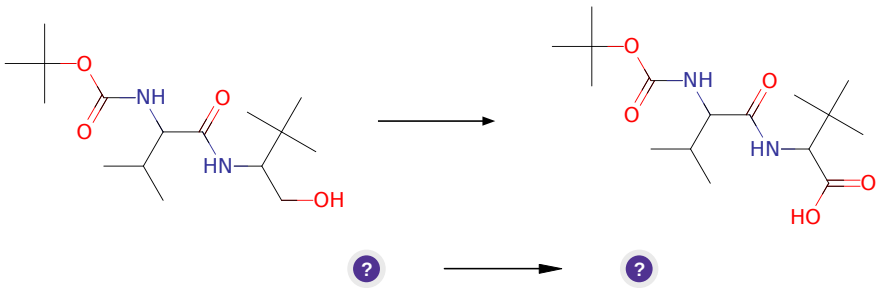
Protections: none

Yield: moderate

Reference: DOI: *10.1021/jo047924f*

Retrosynthesis ID: 245867

2.1.7 Jones Oxidation



Substrates:

1. CC(C)C(NC(=O)OC(C)(C)C)C(=O)NC(CO)C(C)(C)C

Products:

1. CC(C)C(NC(=O)OC(C)(C)C)C(=O)NC(C(=O)O)C(C)(C)C

Typical conditions: cromate.sulfate.H2O.acetone

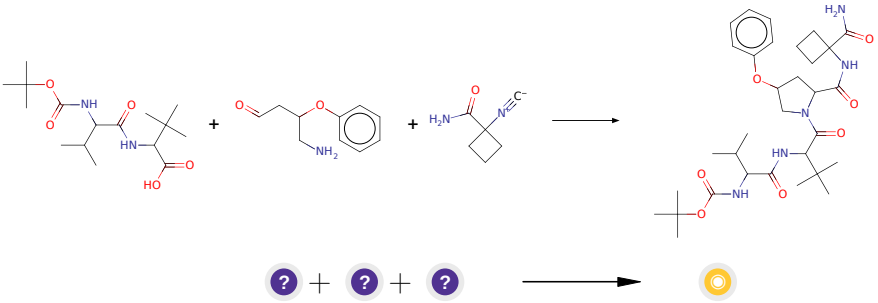
Protections: none

Yield: moderate

Reference: *10.1002/9780470638859.conrr349* and *10.1021/jm00270a004*

Retrosynthesis ID: 11160

2.1.8 Ugi reaction



Substrates:

1. NCC(CC=O)Oc1ccccc1
2. [C-]#[N+]C1(C(N)=O)CCC1
3. CC(C)C(NC(=O)OC(C)(C)C)C(=O)NC(C(=O)O)C(C)(C)C

Products:

1. CC(C)C(NC(=O)OC(C)(C)C)C(=O)NC(C(=O)N1CC(Oc2ccccc2)CC1C(=O)NC1(C(N)=O)CCC1)C(C

Typical conditions: MeOH

Protections: none

Yield: good

Reference: DOI: *10.1002/ange.19590711110*

Retrosynthesis ID: 222