

Paths of analysis*

Analysis 5

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: $\text{TUNNEL_COEF} * \text{FGI_COEF} * \text{STEP} * 20 + 1000000 * (\text{CONFLICT} + \text{NON_SELECTIVITY} + \text{FILTERS} + \text{PROTECT})$

Chemical scoring formula: $\text{SMALLER}^3, \text{SMALLER}^{1.5}$

Min. search width: 400

Max. reactions per product: 60

Strategies: none selected

*The results stated herein were generated using the proprietary platform owned and maintained by Grzybowski Scientific Inventions, Inc., a subsidiary of Merck KGaA, Darmstadt Germany. The results are provided on an as is basis, and shall be used solely in connection with the rights afforded in the license agreement and for no other purpose.

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: 122.50

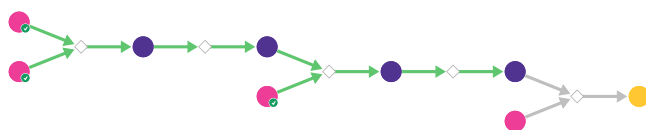
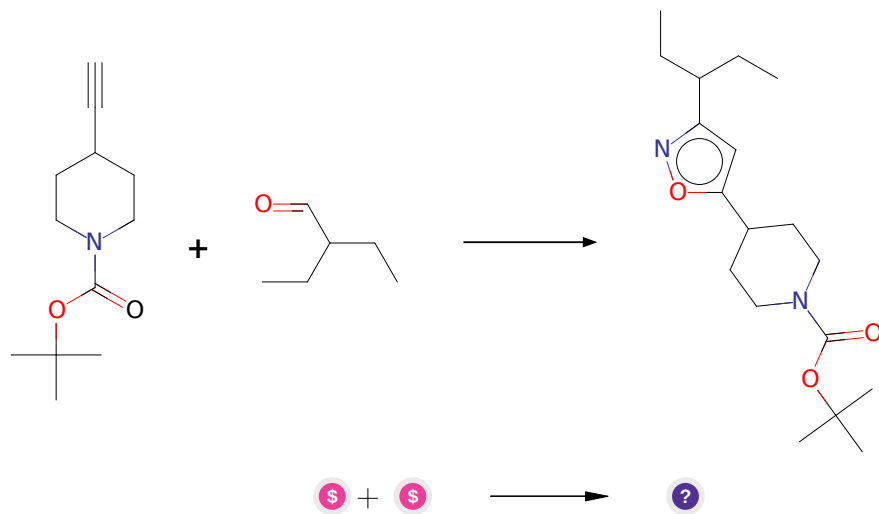


Figure 1: Outline of path 1

2.1.1 Synthesis of isoxazoles from aldehydes and hydrazines



Substrates:

1. 2-Ethylbutanal - *available at Sigma-Aldrich*
2. 4-Ethynylpiperidine-1-carboxylic acid tert-butyl ester - *available at Sigma-Aldrich*

Products:

1. CCC(CC)c1cc(C2CCN(C(=O)OC(C)(C)C)CC2)on1

Typical conditions: 1. nBuLi 2. I2.K2CO3

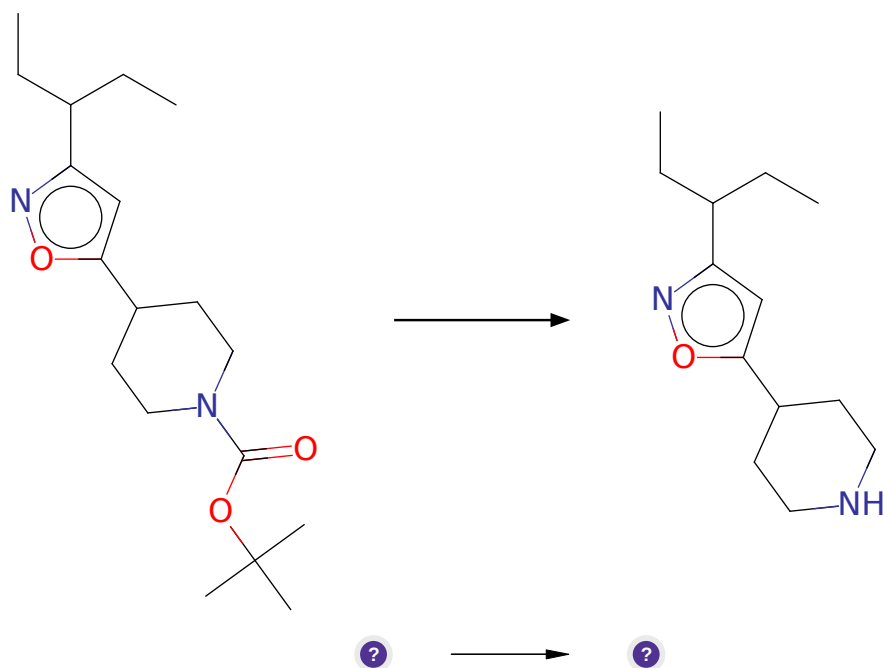
Protections: none

Yield: moderate

Reference: DOI: [10.1021/jo4027116](https://doi.org/10.1021/jo4027116)

Retrosynthesis ID: 49545

2.1.2 Boc removal



Substrates:

1. CCC(CC)c1cc(C2CCN(C(=O)OC(C)(C)C)CC2)on1

Products:

1. CCC(CC)c1cc(C2CCNCC2)on1

Typical conditions: TFA.DCM or HCl.EtOH

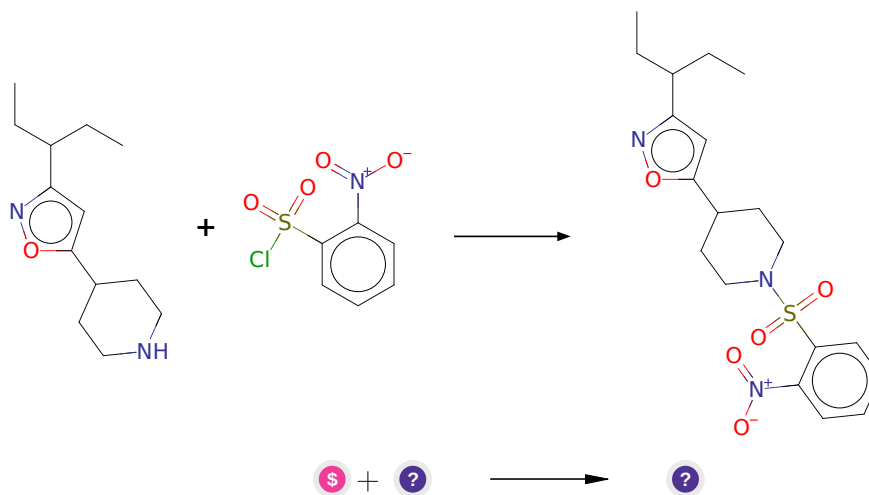
Protections: none

Yield: good

Reference: [10.1021/jm070794t](https://doi.org/10.1021/jm070794t) and [10.1021/jm020598g](https://doi.org/10.1021/jm020598g) and [10.1021/acs.oprd.5b00144](https://doi.org/10.1021/acs.oprd.5b00144) and [10.1016/j.bmc.2003.08.022](https://doi.org/10.1016/j.bmc.2003.08.022)

Retrosynthesis ID: 10025810

2.1.3 Synthesis of sulfonamides from sulfonyl chlorides



Substrates:

1. 2-Nitrobenzenesulfonyl chloride - *available at Sigma-Aldrich*
2. CCC(CC)c1cc(C2CCNCC2)on1

Products:

1. CCC(CC)c1cc(C2CCN(S(=O)(=O)c3ccccc3[N+](=O)[O-])CC2)on1

Typical conditions: Et₃N

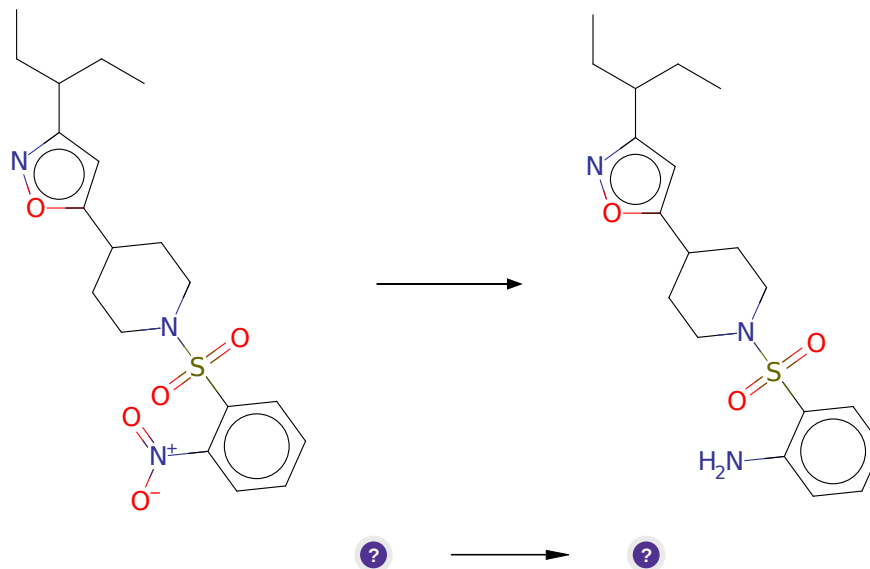
Protections: none

Yield: good

Reference: [10.1021/jm00395a010](https://doi.org/10.1021/jm00395a010) and [10.1002/047084289X.rn00099](https://doi.org/10.1002/047084289X.rn00099) and [10.1016/j.jfluchem.2013.01.009](https://doi.org/10.1016/j.jfluchem.2013.01.009)

Retrosynthesis ID: 247

2.1.4 Reduction of nitro group



Substrates:

1. CCC(CC)c1cc(C2CCN(S(=O)(=O)c3ccccc3[N+](=O)[O-])CC2)on1

Products:

1. CCC(CC)c1cc(C2CCN(S(=O)(=O)c3ccccc3N)CC2)on1

Typical conditions: Zn. aq NH₄. EtOH // Zn.Hcl

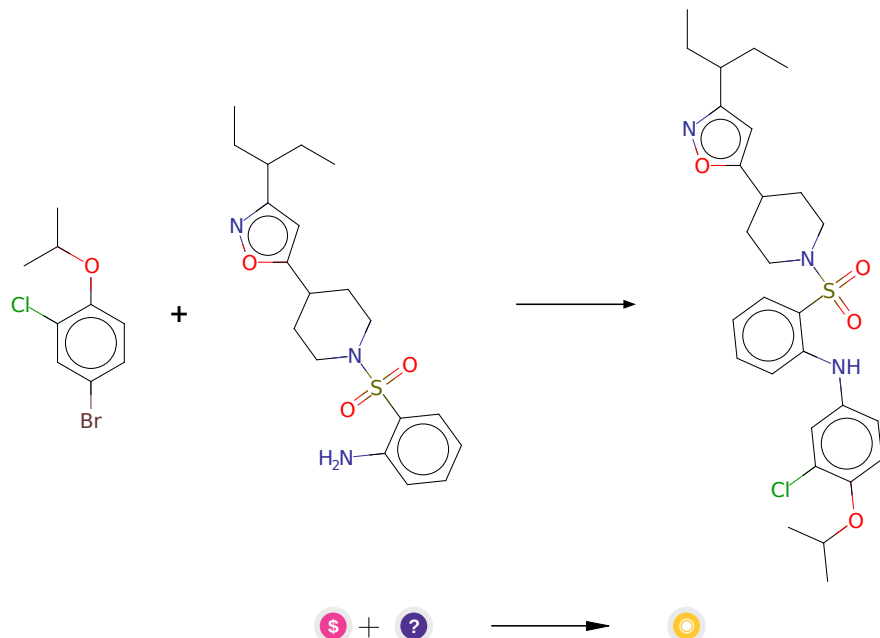
Protections: none

Yield: good

Reference: DOI: [10.1002/anie.201512005](https://doi.org/10.1002/anie.201512005) and [10.1002/anie.201104681](https://doi.org/10.1002/anie.201104681) and [10.3390/molecules17055497](https://doi.org/10.3390/molecules17055497) and [10.3390/molecules19022655](https://doi.org/10.3390/molecules19022655) and [10.1021/ol5033464](https://doi.org/10.1021/ol5033464) (SI,page 3) and [10.5012/bkcs.2013.34.4.1275](https://doi.org/10.5012/bkcs.2013.34.4.1275)

Retrosynthesis ID: 6145

2.1.5 Amination of aryl bromides



Substrates:

1. 4-Bromo-2-chloro-1-isopropoxybenzene - *AOBChem*
2. CCC(CC)c1cc(C2CCN(S(=O)(=O)c3ccccc3N)CC2)on1

Products:

1. CCC(CC)c1cc(C2CCN(S(=O)(=O)c3ccccc3Nc3ccc(OC(C)C)c(Cl)c3)CC2)on1

Typical conditions: Pd.ligand.base or CuI.ligand.base

Protections: none

Yield: good

Reference: [10.1021/ja903049z](#) and [10.1021/jo060945k](#) and [10.1021/jo060190h](#) and [10.1039/B923255A](#) and [10.1021/jm8003625](#) and [10.1021/jo9006738](#)

Retrosynthesis ID: 28544