Paths of analysis*

C133

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

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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: 105.41

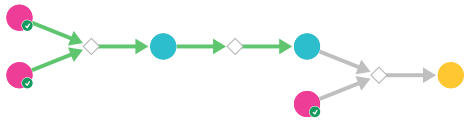
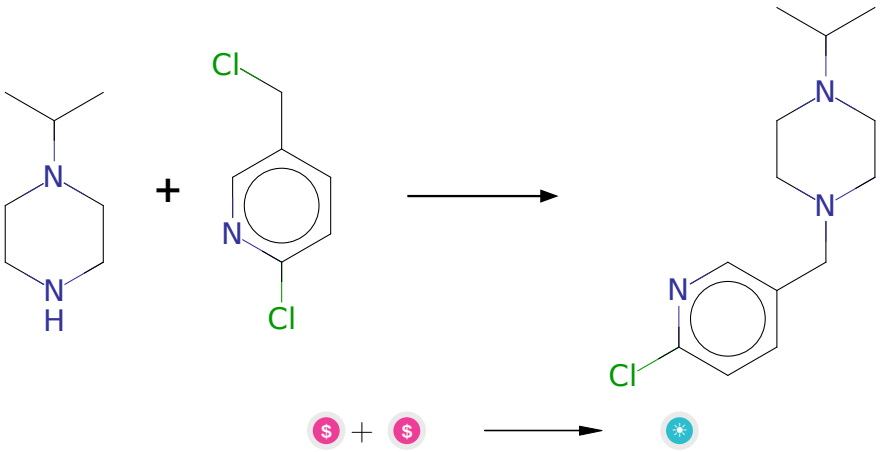


Figure 1: Outline of path 1

2.1.1 Alkylation of amines with alkyl chlorides



Substrates:

1. 2-Chloro-5-(chloromethyl)pyridine - *available at Sigma-Aldrich*
2. 1-Isopropylpiperazine - *available at Sigma-Aldrich*

Products:

1. C13H20ClN3

Typical conditions: KOH. toluene. PTC. catalyst or KI. base e.g. K2CO3

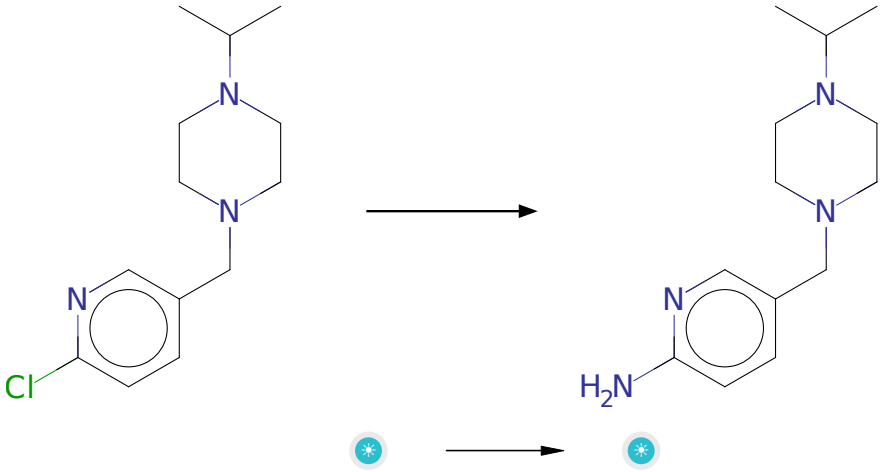
Protections: none

Yield: moderate

Reference: *10.1016/S0040-4020(01)00989-9* and *10.1021/acs.oprd.8b00074* and *10.1016/s0040-4039(00)74286-9* and *10.1080/00397911.2013.828077* and *10.1016/j.bmcl.2012.08.032*

Retrosynthesis ID: 4784

2.1.2 Nucleophilic aromatic substitution



Substrates:

1. C13H20ClN3

Products:

1. 5-[4-(propan-2-yl)piperazin-1-yl]methylpyridin-2-amine

Typical conditions: solvent. Heating or pressure

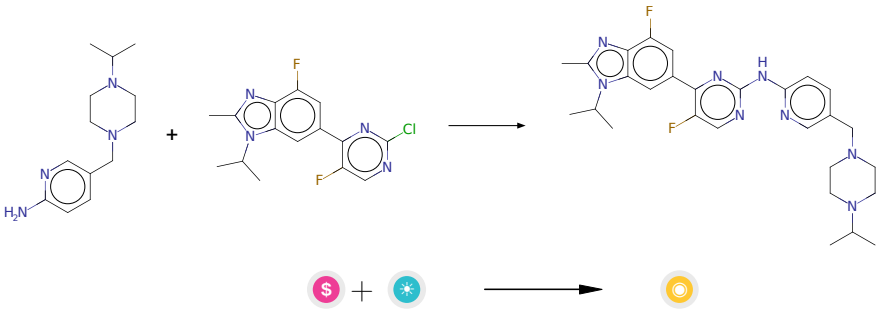
Protections: none

Yield: good

Reference: *10.1021/jm00040a009* or *10.1111/bph.12233* or *10.1246/cl.1987.1187*

Retrosynthesis ID: 5003

2.1.3 Buchwald-Hartwig amination



Substrates:

1. 6-(2-Chloro-5-fluoropyrimidin-4-yl)-4-fluoro-1-isopropyl-2-methyl-1H-benzo[d]imidazole - *available at Sigma-Aldrich*
2. 5-[4-(propan-2-yl)piperazin-1-yl]methylpyridin-2-amine

Products:

1. Cc1nc2c(F)cc(-c3nc(Nc4ccc(CN5CCN(C(C)C)CC5)cn4)ncc3F)cc2n1C(C)C

Typical conditions: PdCl2.NaOtBu.dioxane.heat

Protections: none

Yield: good

Reference: *10.1021/acs.oprd.9b00161* and *10.1002/anie.201904795* and *10.1021/acs.chemrev.6b00512*

Retrosynthesis ID: 10319