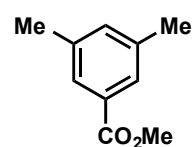


Totalsynthese und stereochemische Strukturbereinigung von Indoxamycin B,

Angew. Chem. 2012, 124, 3531 - 3534, O. F. Jekerm E. M. Carreira



1) Li (2.2 eq.), *t*BuOH (1.05 eq.),
NH₃/THF, -78 °C, then 1 (1 eq.)
2) LAH (1.5 eq.), THF, 0 °C

3) TsOH (10 mol%), Me₂C(OMe)₂
96 % over 3 Steps
4) Pd/C, *t*BuOOH (1.5 eq.), K₂CO₃
(0.25 eq.), CH₂Cl₂, 0 °C, 69 %

A

4) [Cp₂TiCl₂] (3 eq.), *n*BuLi (6 eq.),
2 (1.5 eq.), THF -78 to rt
then A, -40 to 10 °C, 62 %

B

5) *t*BuOK, (3 eq.),
[18]-crown-6 (3 eq.), THF,
-78 to -40 °C, then
Et₃SiCl (3 eq.),
-78 °C, 70 %

6) Pd(OAc)₂ (10 mol%),
O₂ atmosphere, Me₂SO,
45 °C, 74 %

C

tricycle D

7) HCl (aq. 1M, 2.9 eq.), THF, rt, quant.
8) [VO(acac)₂] (5 mol%), *t*BuOOH (3 eq.),
3 (2.5 mol%), 4-A MS, CH₂Cl₂, 40 °C, 75 %

tricycle E

9) TBSCl (1.2 eq.), NEt₃ (2 eq.),
DMAP (0.2 eq.), CH₂Cl₂, 0 °C to rt, 88%
10) DMP (1.5 eq.), CH₂Cl₂, 0 °C to rt, 95 %

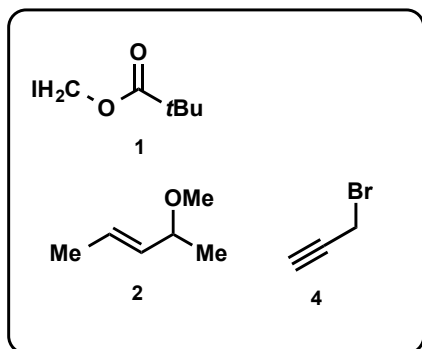
Monoprotection

F

11) KH (1.1 eq.), THF, RT,
then [18]-crown-6 (1.5 eq.),
4 (1.2 eq.), 0 °C, 87 %

G

12) [(Ph₃PAu)₃O]BF₄ (1 mol%),
1,2 dichlorethane, 75 °C, 84 %



H

13) LiBHET₃ (1.1 eq.), THF, -78 °C, 80 %
14) Chlor[2-(di-*tert*-butyl-phosphanyl)
biphenyl]gold (I) (10 mol%), AgOTs (10 mol%),
PhMe, 60 °C, 72 %

Monoreduction

I

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14) $[\text{Mn}(\text{dpm})_3]$ (10 mol%),
 PhSiH_3 (2.5 eq.),
 O_2 -Atmo., EtOH, 73%

15) DMP (1.5 eq.), CH_2Cl_2 ,
0 °C to rt, 72 %

J

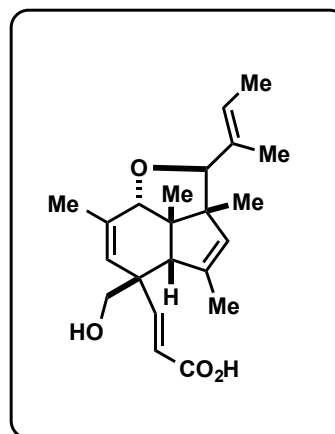
16) Ph_3PEtBr (6 eq.),
 $\text{KN}(\text{SiMe}_3)_2$ (5 eq.),
THF/HMPA (10:1) rt,
-78 °C, then -30 °C, 80 %

K

17) SmI_2 (1 eq.), THF/MeOH (7:3), rt, 99%,
18) DMP (1.25 eq.), CH_2Cl_2 , 0 °C to rt. quant.
19) Mehtyldiethylphosphonoacetat (5 eq.),
NaH (5 eq.), THF, rt, 99 %
20) $\text{BH}_3^*t\text{BuNH}_2$ (2 eq), CH_2Cl_2 , 40 °C, 79%
21) Burgess reagent (2 eq.), PhMe, 110°C, 69 %

L

22) LiOH (10 eq.), then HCl (1M, 29 eq.),
THF/MeOH/ H_2O rt, 96 %



Indoxamycin B

