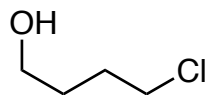
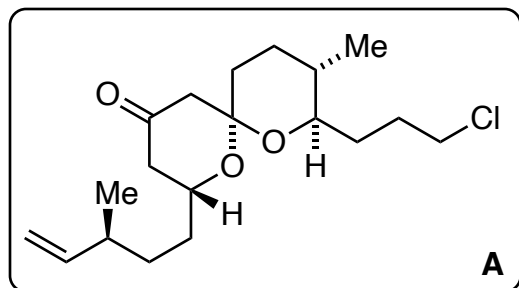


Spiroacetal Formation through Telescoped Cycloaddition and Carbon–Hydrogen Bond Functionalization: Total Synthesis of Bistramide A

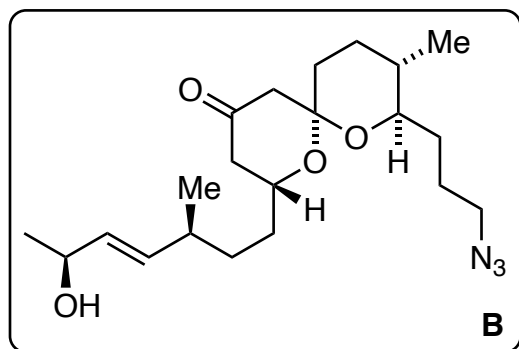
Han, X. and Floreancig, P. E.
Angew. Chem. Int. Ed. **2014**, *53*, 11075–11078.



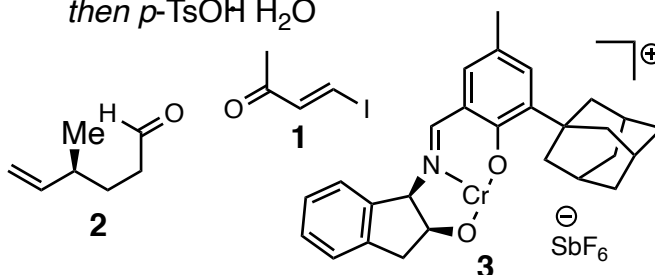
1-6



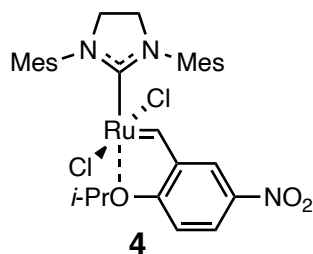
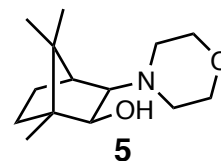
7-12



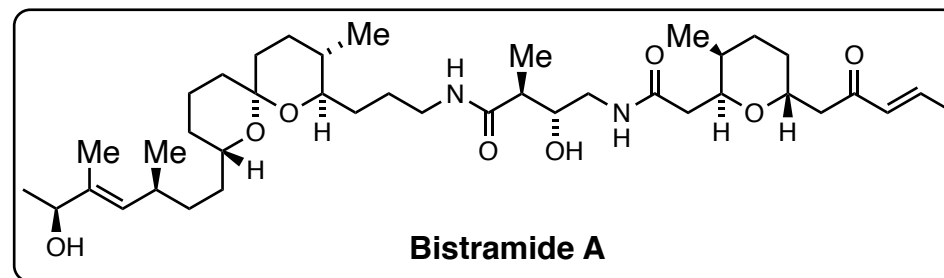
1. (COCl)₂, DMSO, Et₃N
2. *trans*-2-butene, *n*-BuLi, *t*-BuOK
 (–)-(Ipc)₂BOMe
 then BF₃ OEt₂ then product of step 1
 then NaOH, H₂O₂
3. TESCl, imidazole
4. (9-BBN)₂, then **1**, [Pd(dppf)Cl₂], K₃PO₄
5. TESOTf, Et₃N
6. **2**, **3** (cat.), 4 Å MS then DDQ
 then *p*-TsOH H₂O

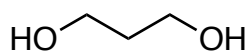


7. *p*-TsNHNH₂, MeOH
8. NaBH₃CN, MeOH pH > 4
9. NaOAc, EtOH, 75 °C
10. methacrolein, **4**
11. Me₂Zn, **5**
12. NaN₃, DMF, 60 °C



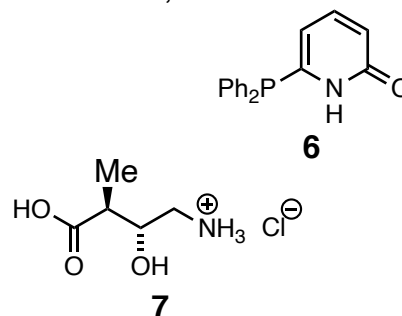
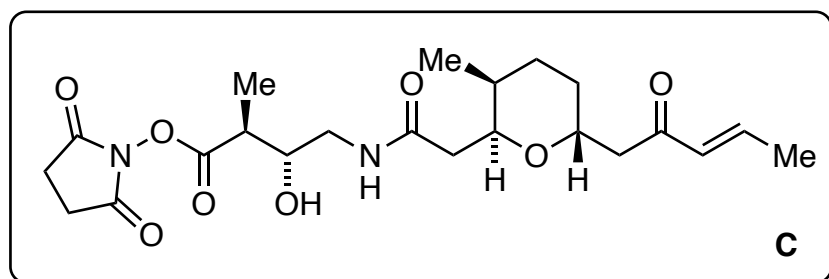
1. Name of the reaction?
Swern oxidation
2. Please name the reaction and explain the stereoselectivity of 90% *ee*.
Brown crotylation, J. Am. Chem. Soc. **1986**, *108*, 293. (see below)
*Hint: 3*S*,4*R* product obtained.*
6. What type of catalyst is this?
Derived from Jacobsen's catalyst
Angew Chem. Int. Ed. **1999**, *38*, 2398; Mechanism: *Tetrahedron* **2001**, *57*, 907.
7. Step 7-9 is one sequence, propose a mechanism and name the reaction.
Wolff-Kishner reduction





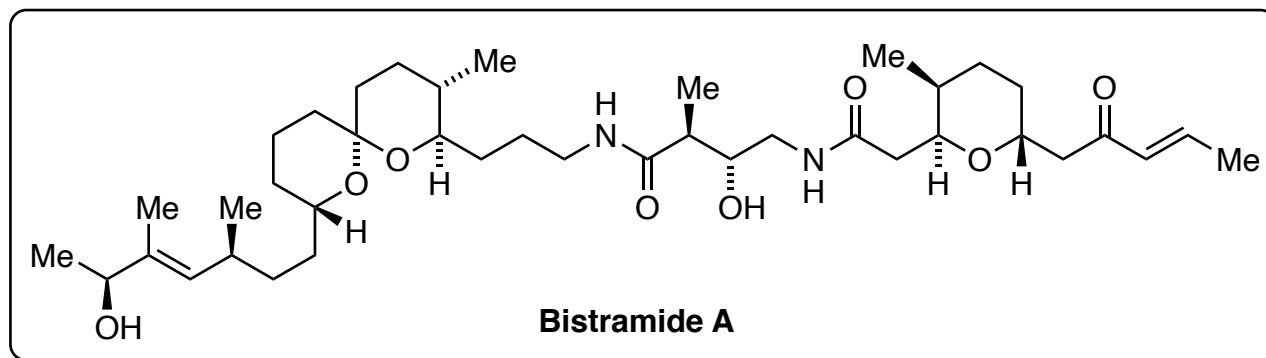
13-21

13. TBSCl, Imidazole
14. $\text{SO}_3 \cdot \text{Py}$, DMSO, Et_3N
15. *cis*-2-butene, *n*-BuLi, *t*-BuOK, (+)-(Ipc)₂BOMe then $\text{BF}_3 \cdot \text{OEt}_2$ then product of step 14 then NaOH, H_2O_2
16. $[\text{Rh}(\text{CO})_2\text{acac}]$, **6**, H_2/CO then Ac_2O DMAP, Et_3N
17. (*E*)-3-penten-2-one, TMSOTf, Et_3N then TMSOTf (1.25 equiv.)
18. H_5IO_6 , CrO_3
19. *N*-hydroxysuccinimide, DCC
20. **7**, *i*-Pr₂NEt
21. *N*-hydroxysuccinimide, DCC



22

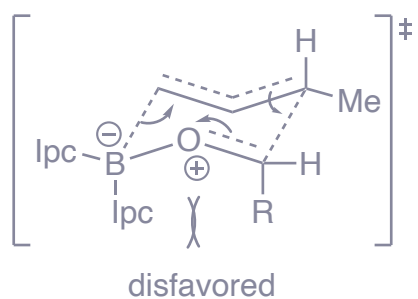
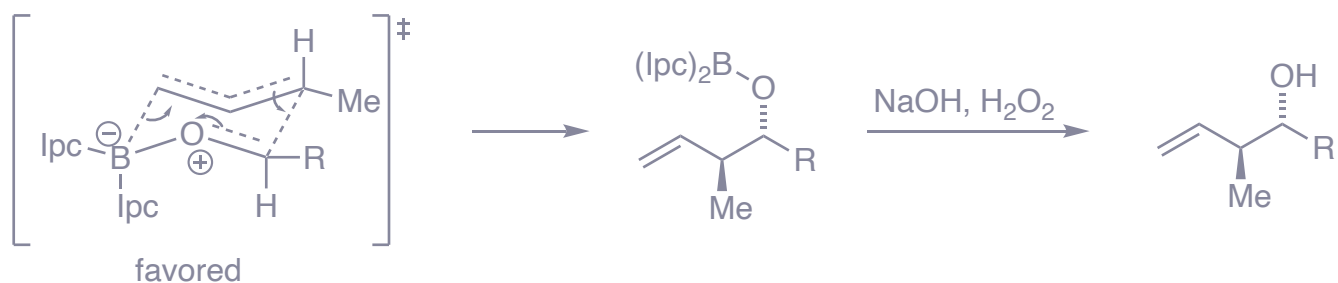
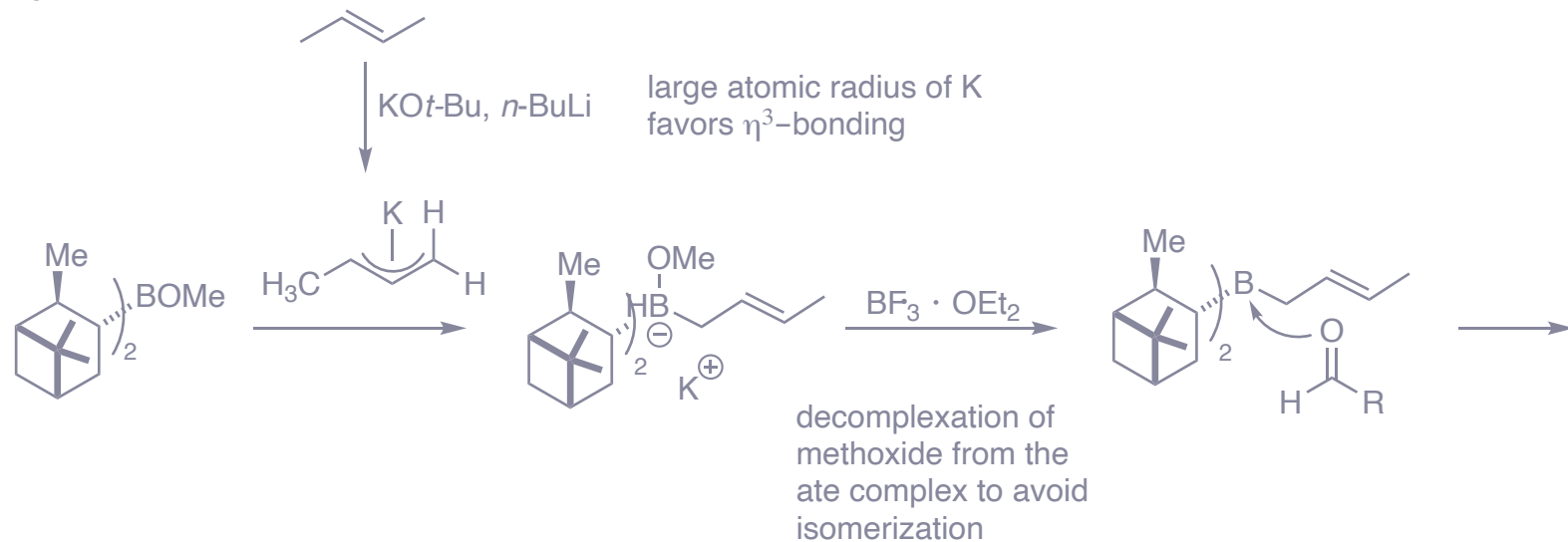
- 22) PMe_3 , H_2O
then **B**



13. *Hint*: Excess of diol
14. Please name the reaction.
Parikh-Doering oxidation
15. *Hint*: 3*S*,4*S* product obtained in 90%*ee*

22. Please name the reaction?
Staudinger reaction

step 2:



step 7-9:

