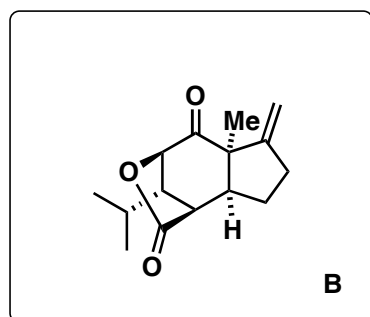
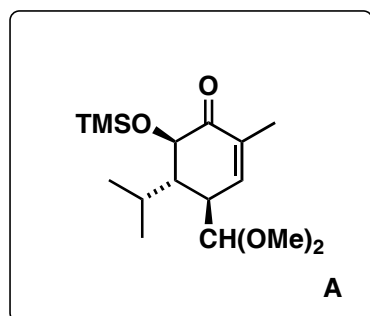
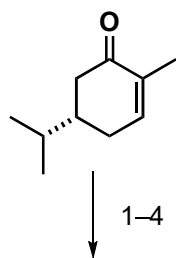


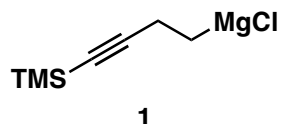
Total Synthesis of (-)-Dendrobine

C.-K. Sha, R.-T. Chiu, C.-F. Yang, N.-T. Yao, W.-H. Tseng, F.-L. Liao, S.-L. Wang.
J. Am. Chem. Soc. **1997**, *119*, 4130–4135.



- 1) MeMgCl, FeCl₃, TMSCl, NEt₃
- 2) CH(OMe)₃, BF₃·OEt₂
- 3) LDA, TMSCl
- 4) *m*-CPBA, NaHCO₃

- 5) PTSA
- 6) **1**, CuI, *then* TMSCl, NEt₃
- 7) NaI, *m*-CPBA
- 8) Bu₃SnH, AIBN
- 9) TFA



Hint step 1: No 1,2- or 1,4-addition occurs.

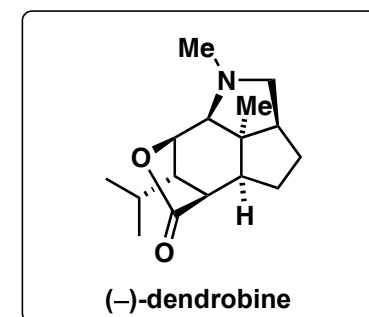
Step 3 and 4: Please name the reaction.
 What are alternatives for this transformation?

Rubottom oxidation

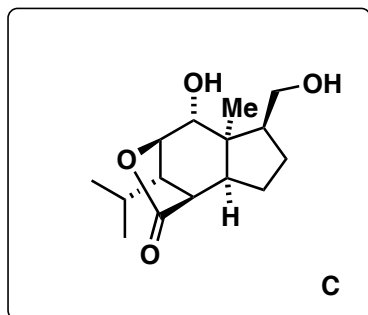
alternatives: Davis oxaziridine, MoOPh, base + O₂, ...

For step 7 the author proposed "I⁺" is generated from
m-CPBA and NaI.

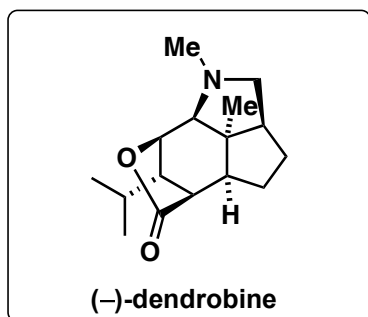
C.-K. Sha et. al. *J. Org. Chem.* **1987**, *52*, 3919–3920.



10–12



13–18



- 10) *m*-CPBA, $\text{BF}_3 \cdot \text{OEt}_2$
- 11) DBU
- 12) $\text{BH}_3 \cdot \text{DMS}$, then H_2O_2 , NaOH

- 13) MsCl, NEt_3
- 14) NaN_3 , 18-crown-6
- 15) CrO_3 , H_2SO_4 , acetone, H_2O
- 16) PPh_3
- 17) NaBH_3CN , HOAc
- 18) $(\text{HCHO})_n$, H_2O , HCOOH

Step 11: Please name the reaction.

[Kornblum–DeLaMare](#)

Step 12: Please provide a mechanism.

Related reference for step 10 and 11:

One-step conversion of protected lactols into lactones

P. A. Grieco et. al. *Tetrahedron Lett.* **1978**, *19*, 419–420.

Step 15: Please name the reaction.

[Jones oxidation](#)

Step 16: Please name the reaction.

[Staudinger reduction](#)