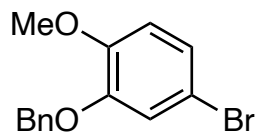


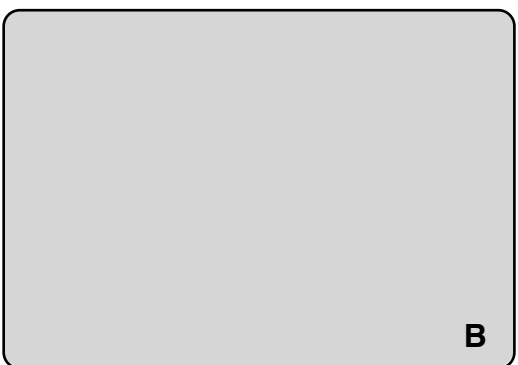
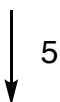
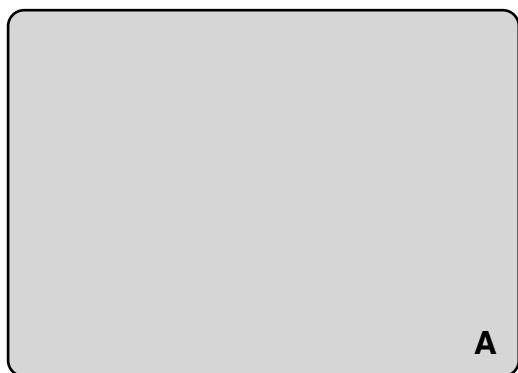
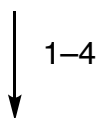
Deconstructive Asymmetric Total Synthesis of Morphine-Family Alkaloid (-)-Thebainone A

Hou, S.-H.; Prichina, A. Y.; Dong, G.

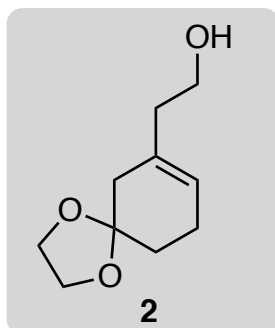
Angew. Chem. Int. Ed. **2021**, *60*, 13057–13064.



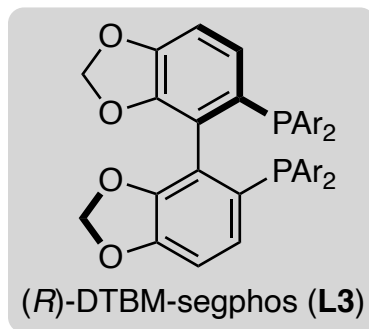
1



- 1) THF, *n*-BuLi, r.t., 16 h, *then 1*, *then* LiTMP
- 2) PCC
- 3) Pd(OH₂)/C, H₂
- 4) **2**, DEAD, PPh₃



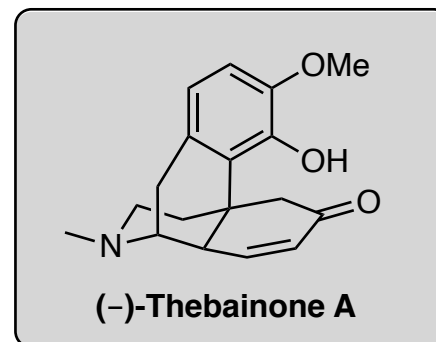
- 5) [Rh(COD)₂]NTf₂ (4 mol%), **L3** (4.8 mol%)
o-difluorobenzene, 130 °C, 48 h



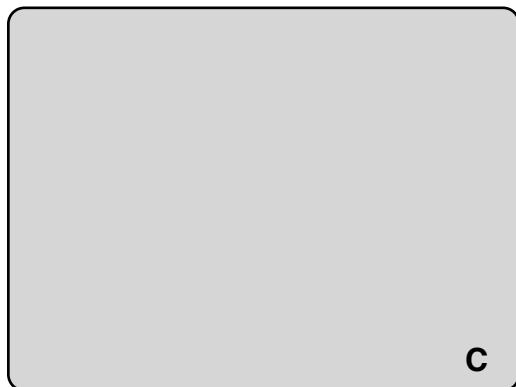
Please provide a mechanism for step 1.

Suggest a preparation for compound **2**.

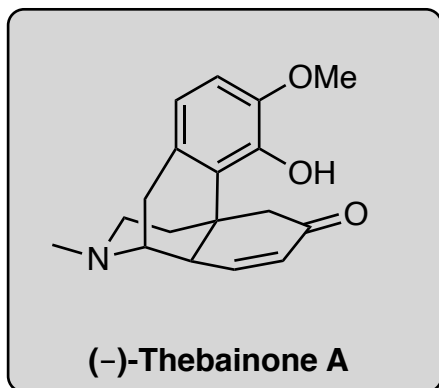
Provide a mechanism for step 5.
HINT: The product of this key step contains four 6-membered rings.



6–10



11–14



- 6) LiAlH_4
- 7) Ac_2O , then 2 M HCl
- 8) BBr_3
- 9) CH_2N_2 , MeOH
- 10) $\text{TMSOCH}_2\text{CH}_2\text{OTMS}$, TMSOTf
then py, TsNHMe, Cs_2CO_3 , then MeOH

- 11) Martin's sulfurane
- 12) sodium naphthalenide, then HCl
- 13) NaSEt
- 14) TFA, MeCN,
then $\text{Pd}(\text{TFA})_2$, DMSO, 80 °C

What is the pKa of TsNHMe?

Draw the structure of Martin's sulfurane?
Name 2 alternatives.

Suggest a synthetic transformation
toward codeine or morphine from an
appropriate intermediate.