Total Synthesis of (+)-Hinckdentine A

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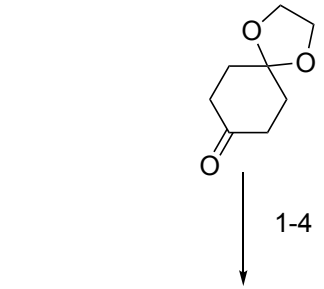
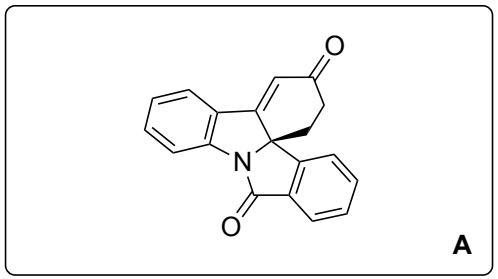
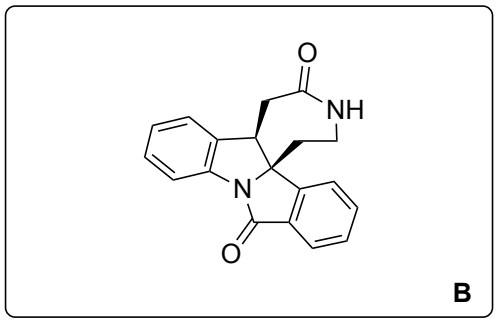


1-4



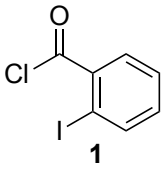
A

5-8



B

1) $PhNHNH_2$, EtOH, *then* $HOCH_2CH_2OH$, 210 °C
2) NaH, DMAP, **1**, DMF, 0 °C
3) *p*-TsOH•H_2O, CH_3CN, H_2O
4) $Pd_2(dba)_3$•$CHCl_3$, (*S*,*R*,*R*)-**2**, NaOAc, *t*-BuOH



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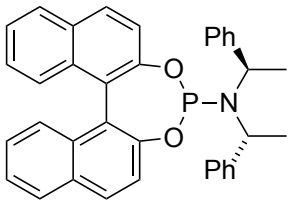


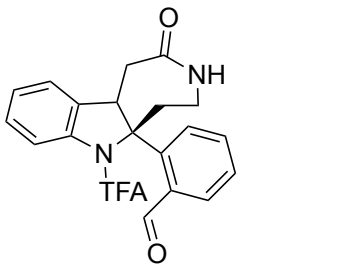
(*S*,*R*,*R*)-**2**

5) LiHMDS, TMSCl, *then* NOCl
6) $SOCl_2$, *then* CF_3CH_2OH
7) H_2 Pd/C, EtOAc
8) H_2, Raney Ni, TFA, *t*-BuOH, *then* $NaHCO_3$

Step 4: Propose a mechanism. Name the class of ligand and who invented them. The *R* product is made. See next page

Step 6: Name the reaction. Beckmann fragmentation
Step 7 *Hint*: The hydrogenation is highly selective and after washing with cold EtOH the product is isolated in >99:1 er.

9-11



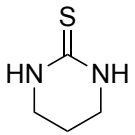
C

9) $NaBH_4$, MeOH, THF
10) TESCl, Pyridine, then TFAA
11) Jones reagent

Step 9 is a modified version of Soai's method. It is suggested in their paper that MeOH forms "Alkoxyhydroborate" which may have higher reducing power.
What is Jones reagent? CrO_3 and H_2SO_4

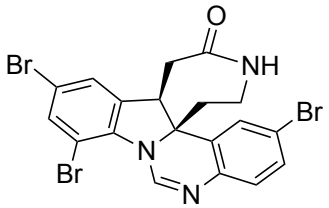
12-15

12) NH_2OH•HCl, NaOAc
13) NCS, *then* **3**, Et_3N
14) KSAc
15) Br_2, CH_3NO_2, *then* $HC(OCH_3)_3$, TFA



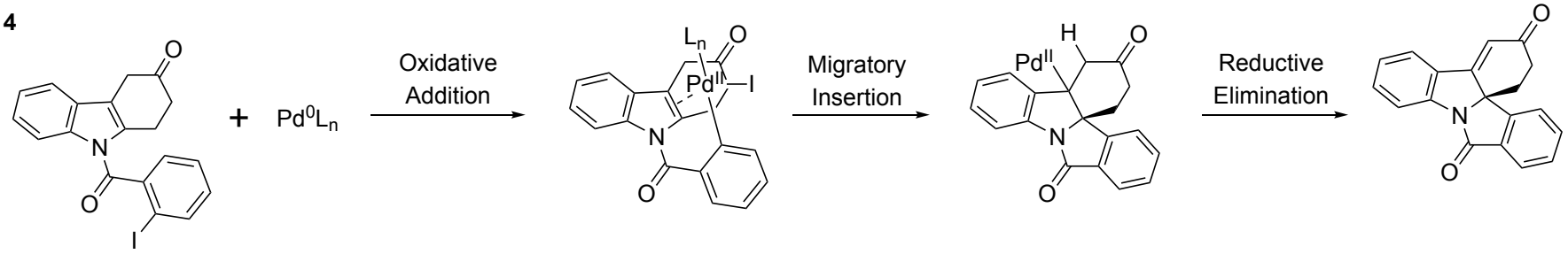
3

12) What is the name of the functional group formed?
Aldoxime
13) Propose a mechanism for step 13. *Hint*: an isothiocyanate is formed. See next page



(+)-Hinckdentine A

Step 4



Step 13