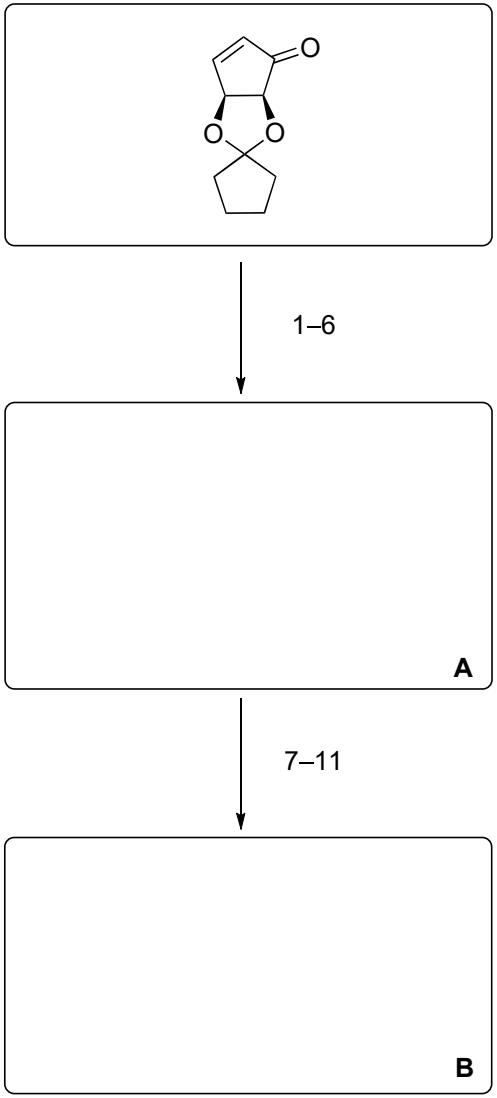
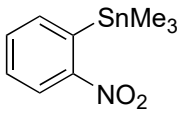
Formal Syntheses of (–)- and (+)-Phalarine by a hypervalent iodine mediated oxidative double cyclization

Hanfeng Ding and David Y.-K. Chen

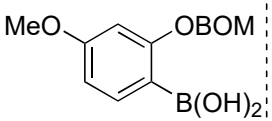
Angew. Chem. Int. Ed. **2011,** 50, 676
J. Am. Chem. Soc. ***2010,*** *132, 8506-8512*



1) I_2, pyridine, DMAP ,
2) **1**, $PdCl_2(PhCN)_2$, CuI
3) K-selectride
4) NaH, $PhNTf_2$
5) **2**, $[Pd(PPh_3)_4]$
6) H_2, Pd/C



1



2

7) TsCl, pyridine
8) H_2, $Pd(OH)_2$
9) $AcOH/H_2O$ (4:1)
10) PIFA
11) $Pb(OAc)_4$, $MeNH_2$, $NaBH(OAc)_3$

Step 2: Reaction name

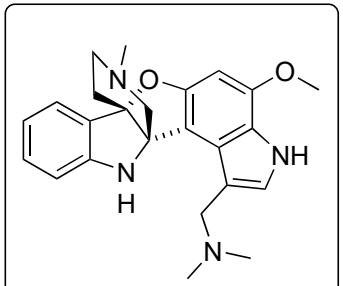
Step 3: Structure of K-selectride

Step 5: Structure of BOM, reaction name

Step 10 (hint): (+)(–)-Diastereomers are formed

Step 10: Structure of PIFA, propose a mechanism

Step 11: Name the transformation



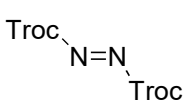
(–)-Phalarine

B

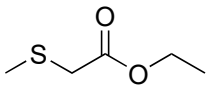
12-18

(–)-Phalarine

12) **3**, TFA
13) Zn, AcOH
14) **4**, SO_2Cl_2, *then* NEt_3
15) BH_3
16) RaNi



3



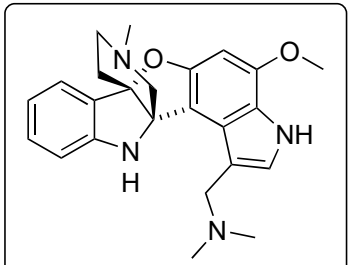
4

17) **5**, AcOH
18) Na(Hg), Na_2HPO_4, MeOH

5

Step 12: Structure of Troc

Step 14: Reaction name, propose a mechanism and classify the key step, name 3 other accesses to this class of heterocycle



(–)-Phalarine