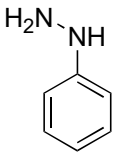
Enantioselective Total Synthesis of (+)-Flavisiamine F via Late-Stage Visible-Light-Induced Photochemical Cyclization

X. Tong, B . Shi , K . Liang, Q. Liu , C . Xia

Angew. Chem. Int. Ed. **2019**, *58*, 5443–5446.



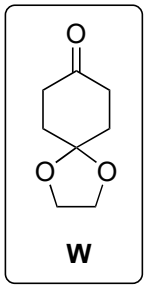
1-4

A

5-11

B

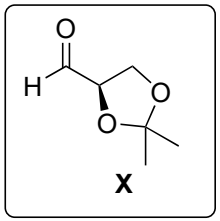
1) **W**
2)ethylene glycol 190°C
3) NaOH, TBAHS, $PhSO_2Cl$
4) *p*-TsOH•H_2O



W

Name of step 1 and 2? Mechanism?
Name three different general ways to access this class of compounds. What are the starting materials/conditions?

5) LHMDS, $PhNTf_2$
6) $CrCl_2$, $NiCl_2$ (cat.), **X**
7) IBX
8) $LiBHEt_3$
9) NaH, CCl_3CN
10)TMSOTf, DIPEA
11) K_2CO_3, PhCl, reflux, *then* 1N HCl

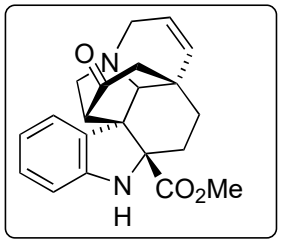


X

Name of step 6? Mechanism?

Name of step 9?

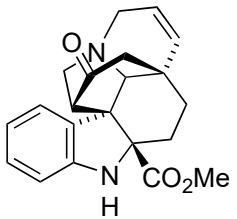
Name of step 11?



12-18

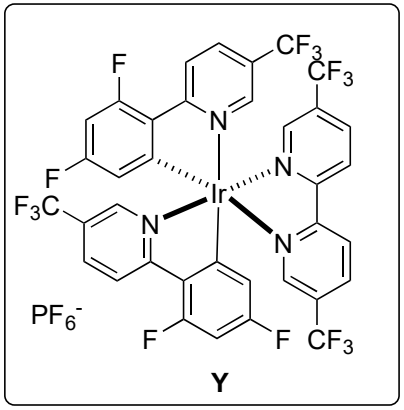
C

19-22



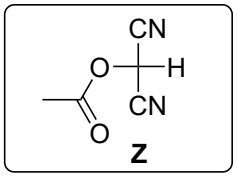
(+)-Flavisiamine F

12) Ag_2O, MeI
13) KHMDS, TBSCl
14) DIBAL
15) K_2CO_3, allyl bromide
16) aq. HCHO/EtOH, *then* 1N HCl
17) *p*-TsOH, Grubbs^{2nd} generation catalyst
18) LiHMDS, then I_2



Y

19) Et_3N, **Y** (5 mol%), air, blue LED, DMF
20) imH, **Z**
21) K_2CO_3, H_2O_2
22) HCl, MeOH, reflux



Z

Name of step 16)
Structure of Grubbs^{2nd} generation catalyst?