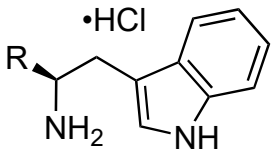
Total Synthesis of (+)-Arborisidine

Z. Zhou, A. X. Gao, S. A. Snyder *J. Am. Chem. Soc.* **2019**, *141,* 7715-7720



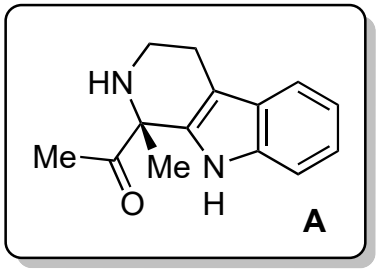
R = CO_2Me

1-3

1) 2,3-butadione, MeOH, 65 °C
2) NH_3, MeOH *then* TFAA, Et_3N
3) $NaBH_3CN$, 4-$CF_3C_6H_4CHO$, MeOH/THF

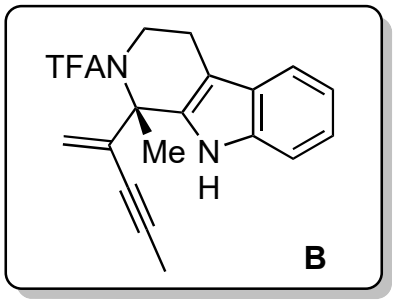
Please provide the name of the reaction in step 1.
Pictet-Spengler

Please propose a mechanism for step 3.
See below

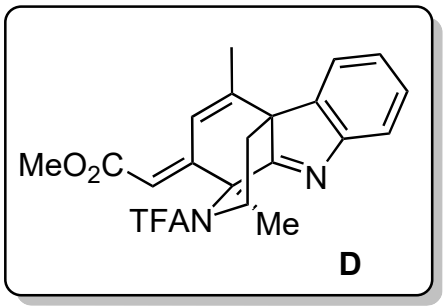


6,7

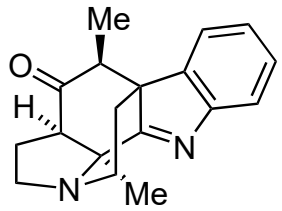
6) 1-propynyllithium, THF, – 78 °C
7) TFAA, pyridine, – 78 °C to 23 °C



8,9

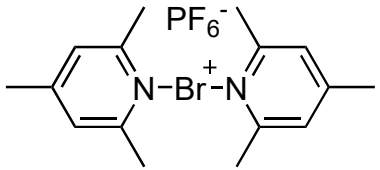


10-14

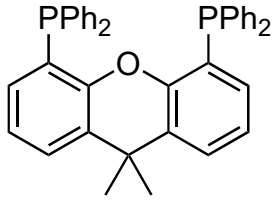


arborisidine

8) Ph_3PAuCl, $AgBF_4$, MeOH, 40 °C
9) $Br(coll)_2PF_6$, CH_2Cl_2, – 78 °C to r.t.
then $Pd(OAc)_2$, Xantphos, CO (balloon), dioxane/MeOH/Et_3N, 70 °C



$Br(coll)_2PF_6$

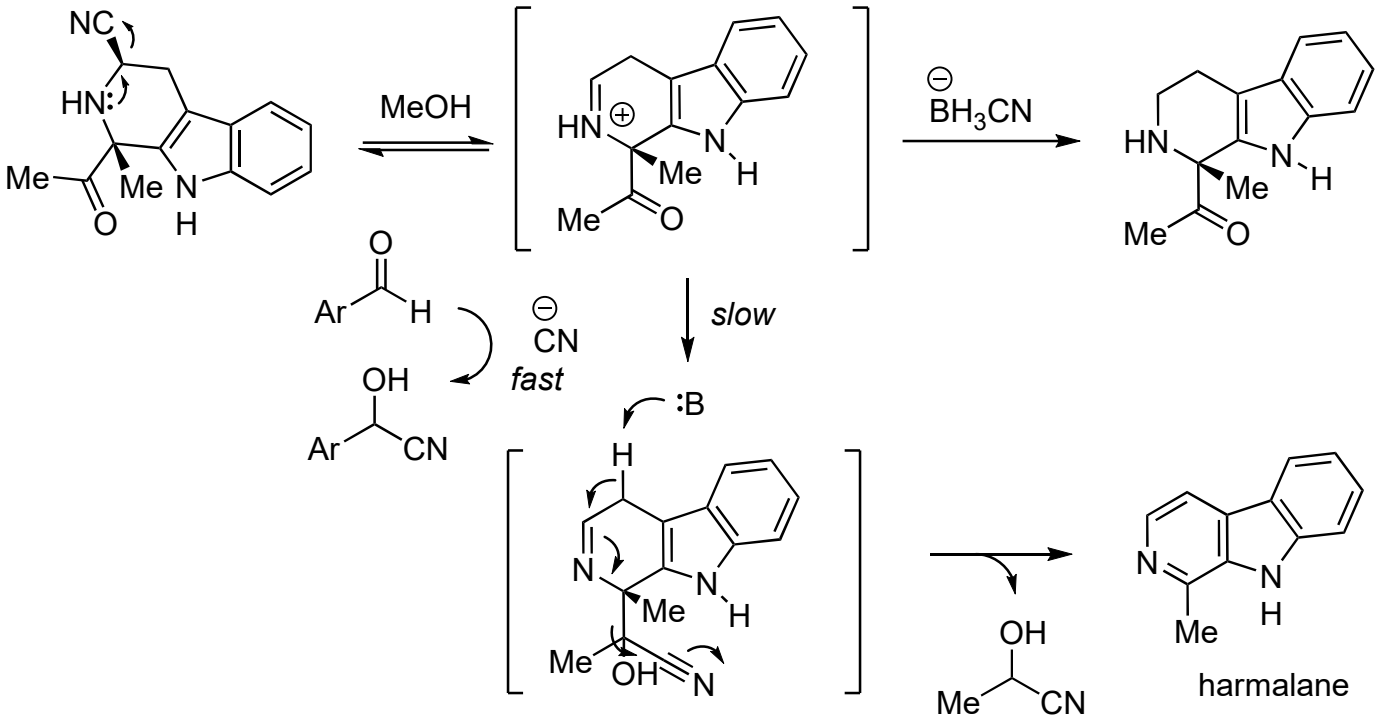


Xantphos

10) $Mn(dpm)_3$, $PhSiH_3$, *i*-PrOH/$(CH_2Cl)_2$
11) $NaBH_4$, MeOH, 23 °C to 100 °C
12) BH_3•THF, *then* H_2O, Me_3NO
13) PhIO, CH_2Cl_2
14) DMP, CH_2Cl_2

Please propose a mechanism for step 8
See below

Proposed mechanism for the reductive decyanation



Step 8