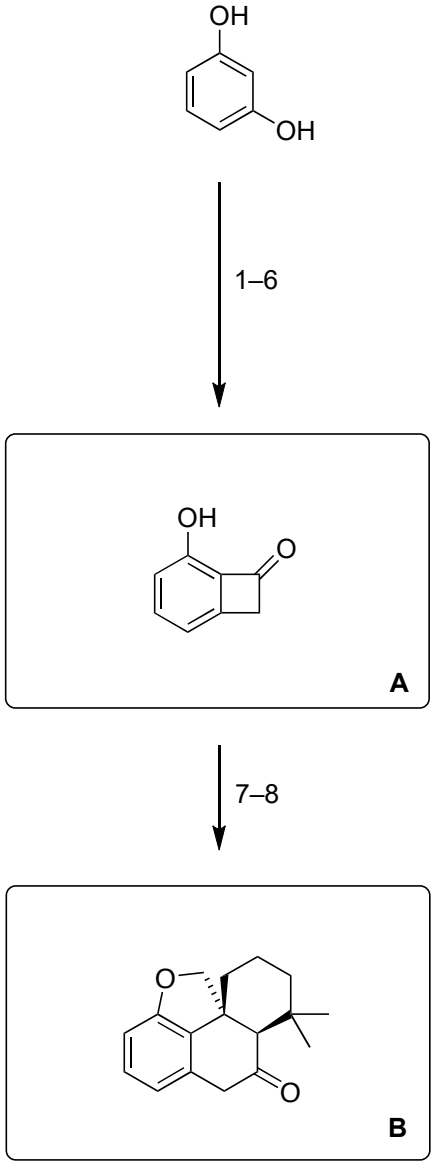
Total Synthesis of Cycloinumakiol

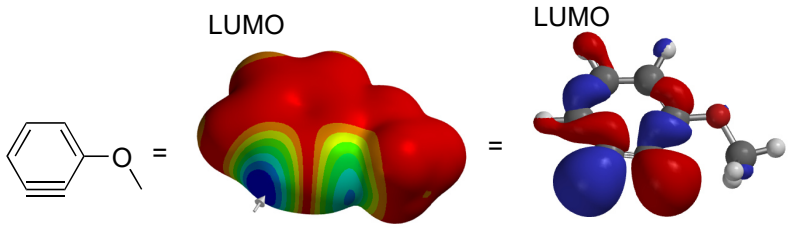
Tao Xu and Guangbin Dong

ACIE ***2014****, 53,* 10733–10736.

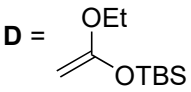


1) I_2
2) Tf_2O, DIPEA
3) Cs_2CO_3
4) TBSCl, ImH, DMAP
5) *n*-BuLi, **D**
6) HF (40%)

7) DIAD, PPh_3, **E**
8) $[Rh(CO)_2Cl]_2$, $P(C_6F_5)_3$, THF, 140 °C, 24 h, 64%



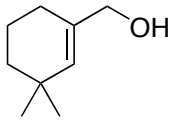
(DFT calculation)

D = 

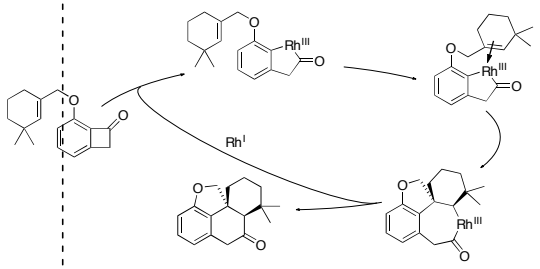
Step 5: Explain the selectivity! Draw the orbitals!

"A possible rationale is the
the enhanced electrophilicity at C-metha relative to C-ortho due to inductive electron withdrawal by the alkoxy group, rendering the C-metha position the preferred site for initial interaction with nucleophilic reaction partners"

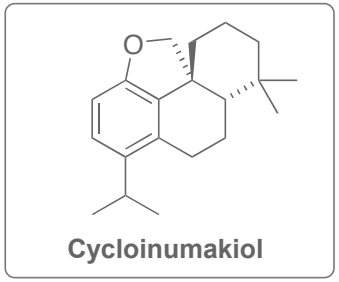
Org. Lett., Vol. 5, No. 20, 2003

E = 

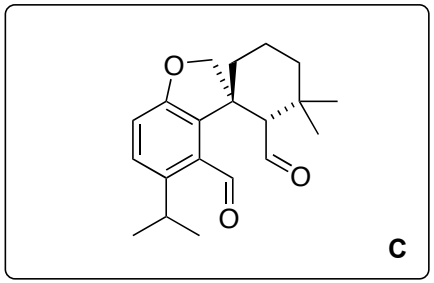
Step 8: Think of a mechanism!



Angew. Chem. Int. Ed. 2012, 51, 7567 –7571

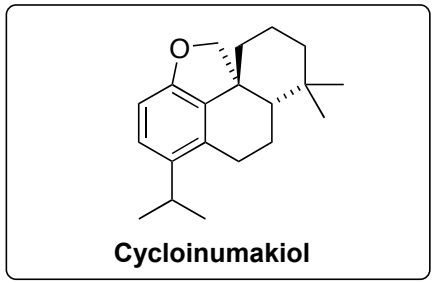


9–14



C

15–16



Cycloinumakiol

9) NBS, NH_4OAc (10%), Et_2O
10) $Pd(PPh_3)_4$, **F**
11) Pd/C, H_2
12) LAH, *then* Martin's sulfurane
13) O_3, PPh_3
14) DBU, 130 °C, 18 h

15) Zn, $TiCl_4$, pyr, THF, 90 °C
16) H_2, Pd/C

F = 

Step 9: What is the role of NH_4OAc ⇢ generation of HBr

$RNBr + NH_3 \longrightarrow Br_2 + N_2 + RNH$

$Br_2 + NH_3 \longrightarrow HBr + N_2$

Chem. Commun., 2004,0, 470-471