
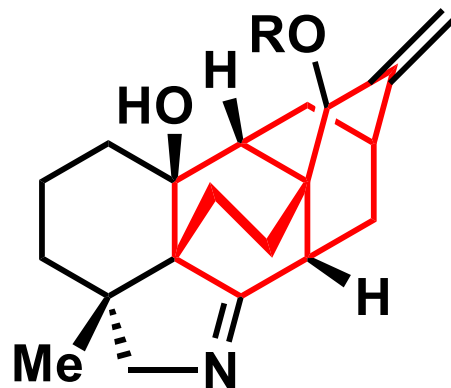


# Asymmetric Total Synthesis of Arcutinidine, Arcutinine, and Arcutine

Shupeng Zhou,<sup>†</sup> Kaifu Xia,<sup>†</sup> Xuebing Leng,<sup>‡</sup> and Ang Li<sup>\*,†</sup> 



- Discovered by Bessonova and co-workers nearly two decades ago.
- Interesting owing to its wide variation and complicated carbon skeleton.
- Contains two doubly fused bicyclo[2.2.2]octane moieties and a congested pyrroline motif.

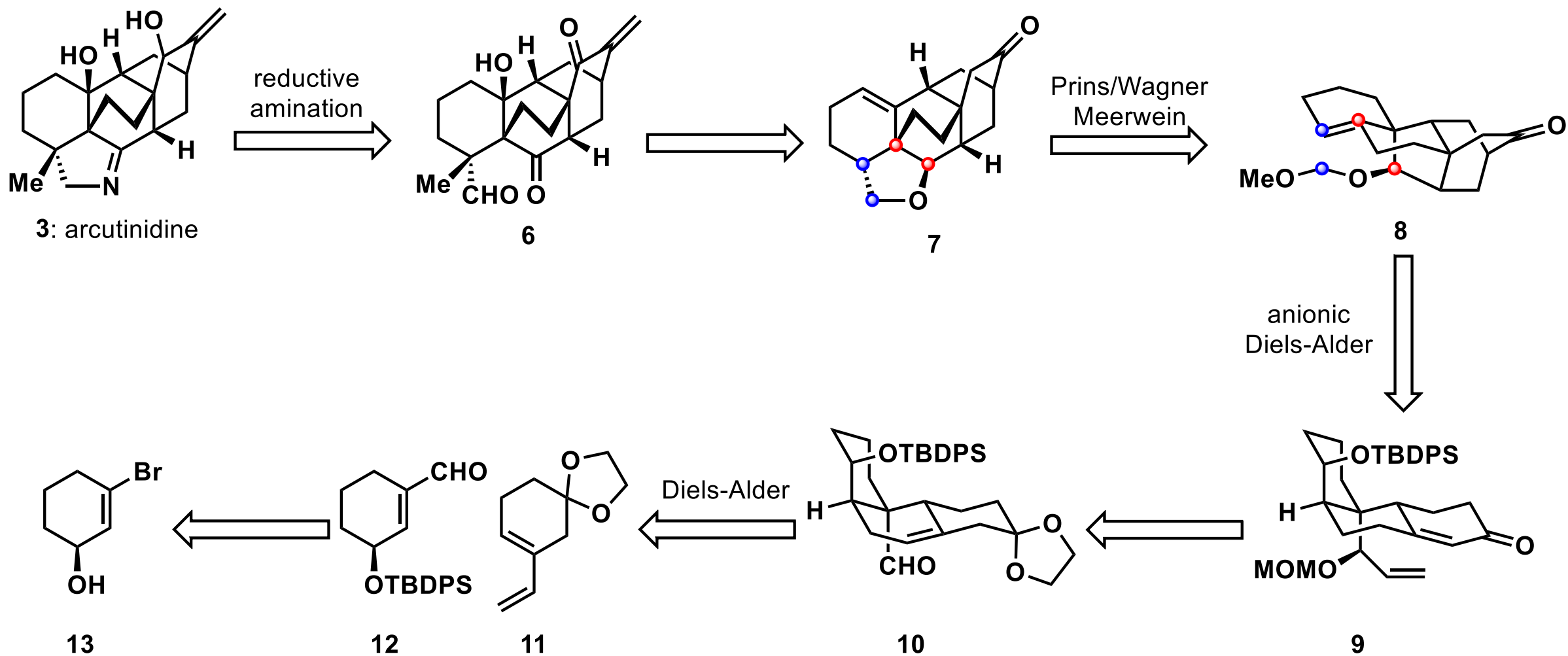
1: arcutine (R = (S)-s-BuCO)

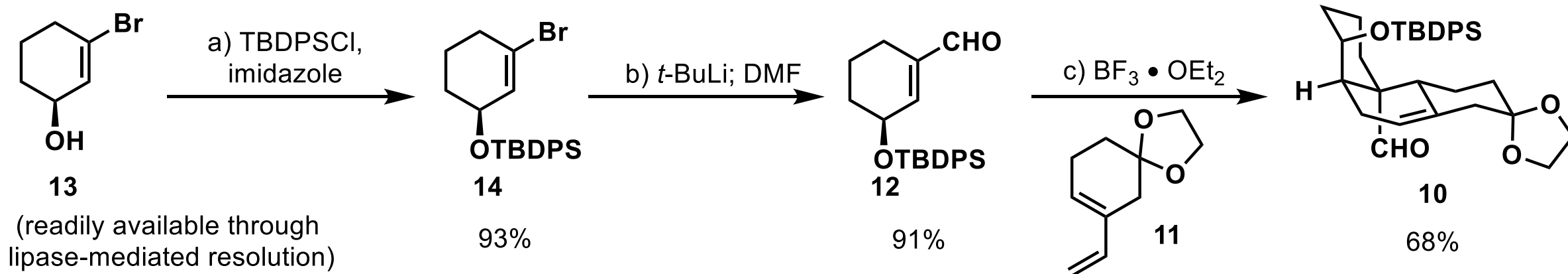
2: arcutinine (R = *i*PrCO)

3: arcutinidine (R = H)

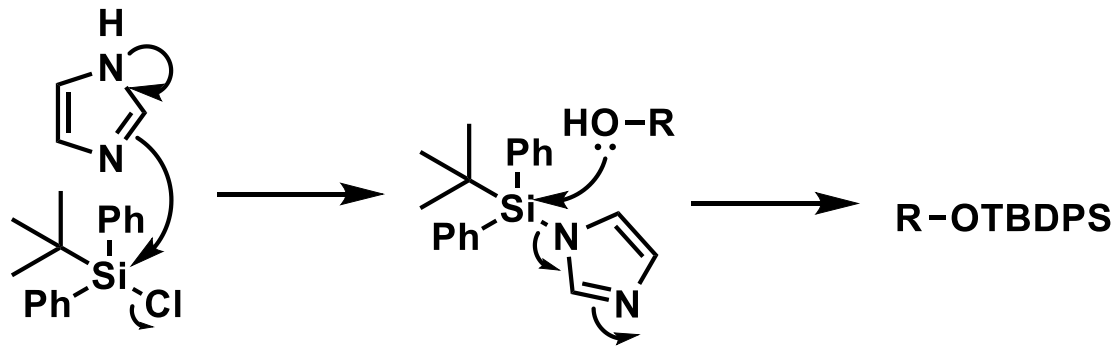
Ziyong Wang  
 Liu Research Group  
 Total synthesis presentation  
 10/31/2019

# Retrosynthetic Analysis:

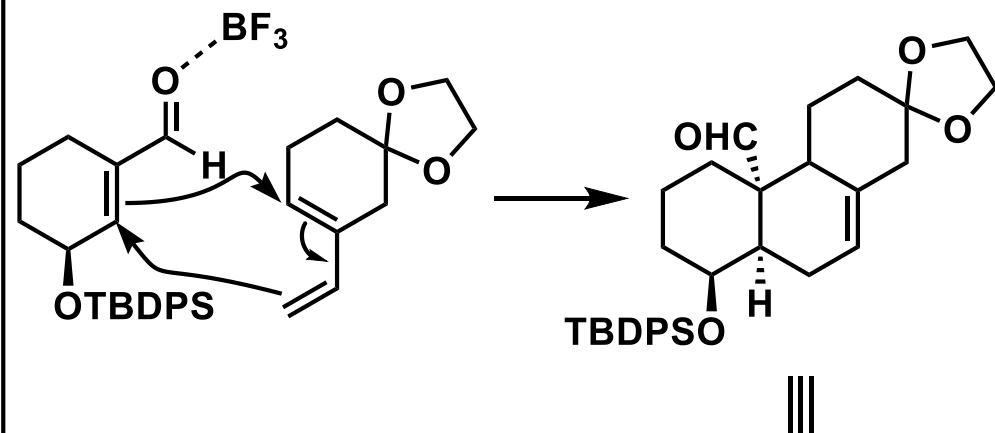




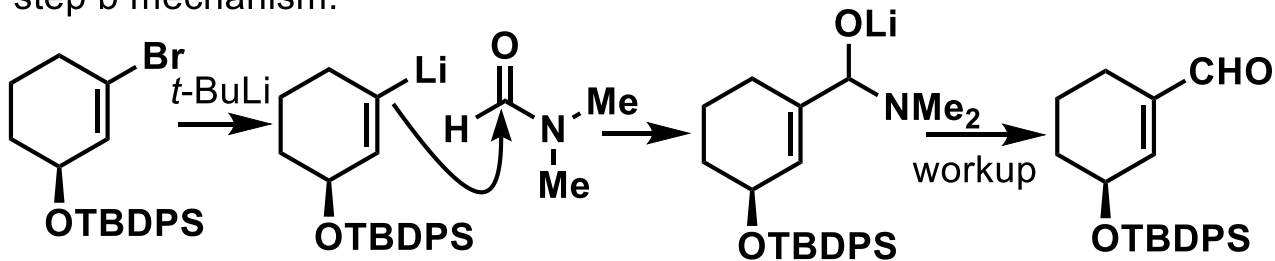
step a mechanism:

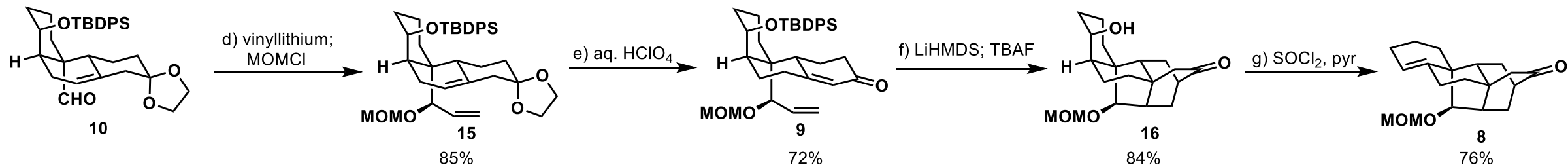


step c mechanism:

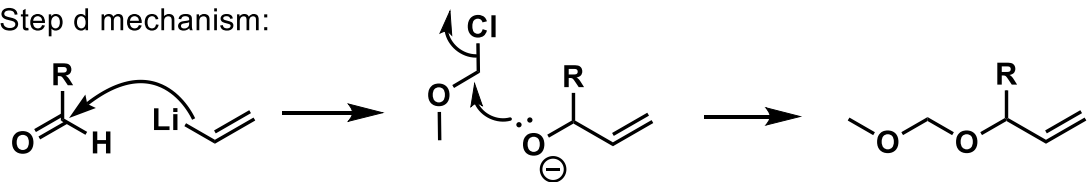


step b mechanism:

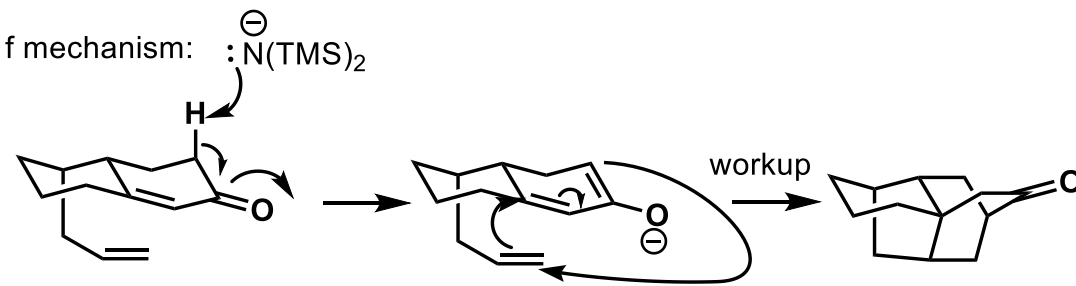




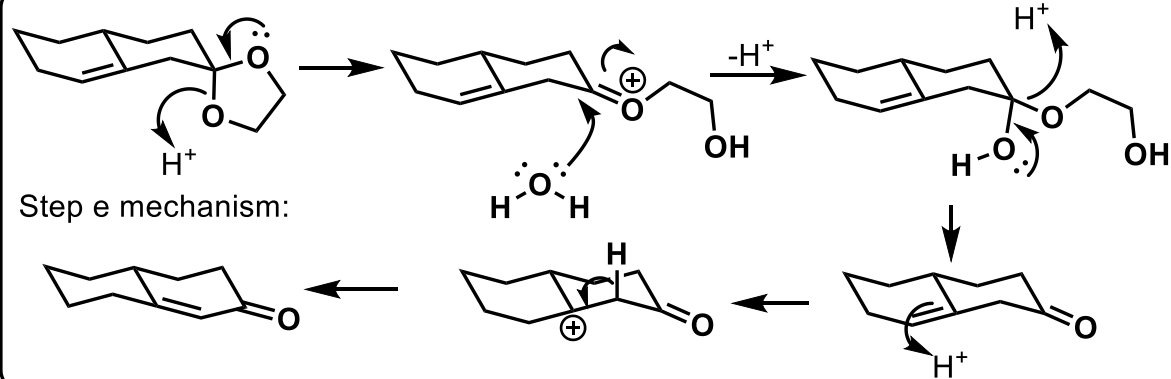
Step d mechanism:



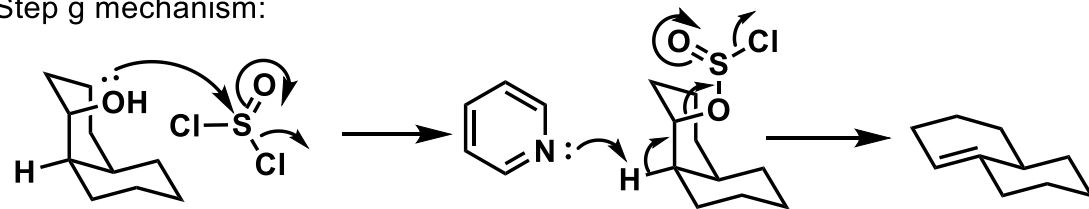
Step f mechanism:

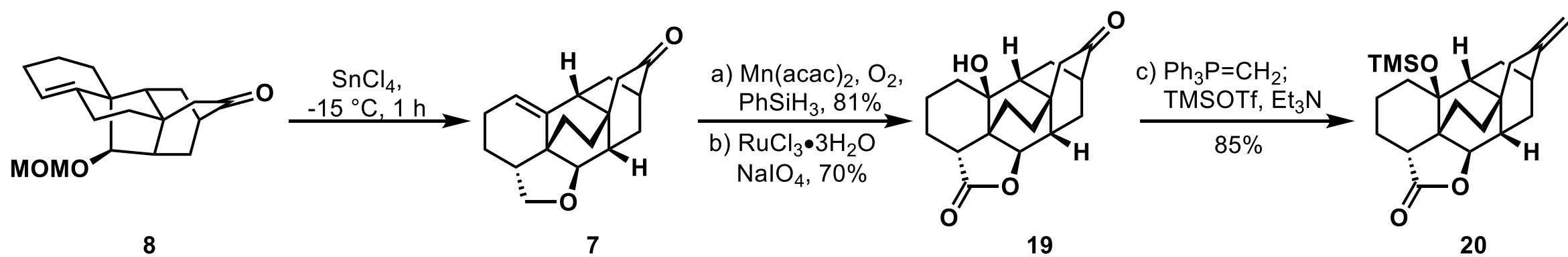


Step e mechanism:

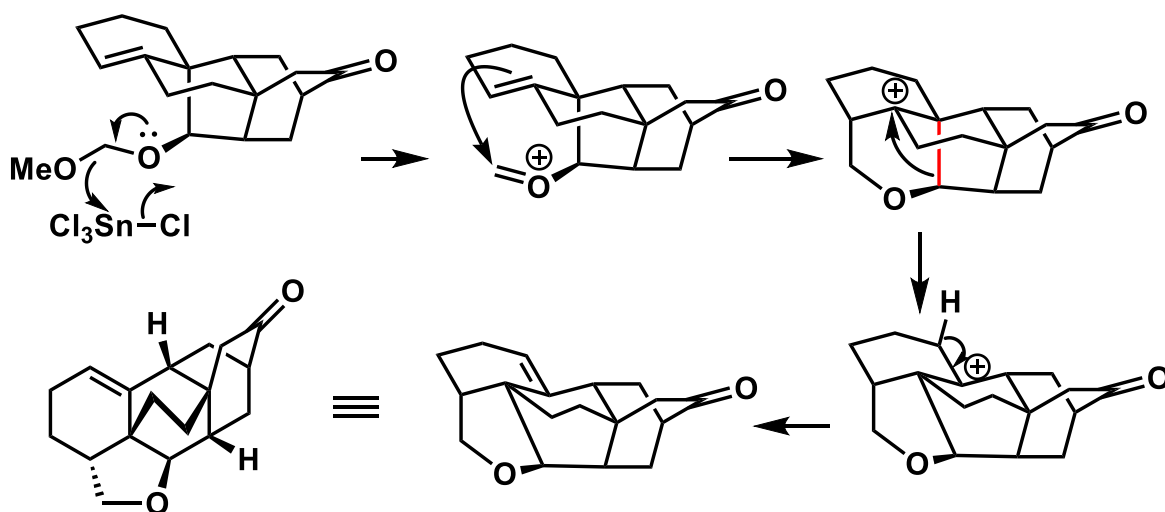


Step g mechanism:

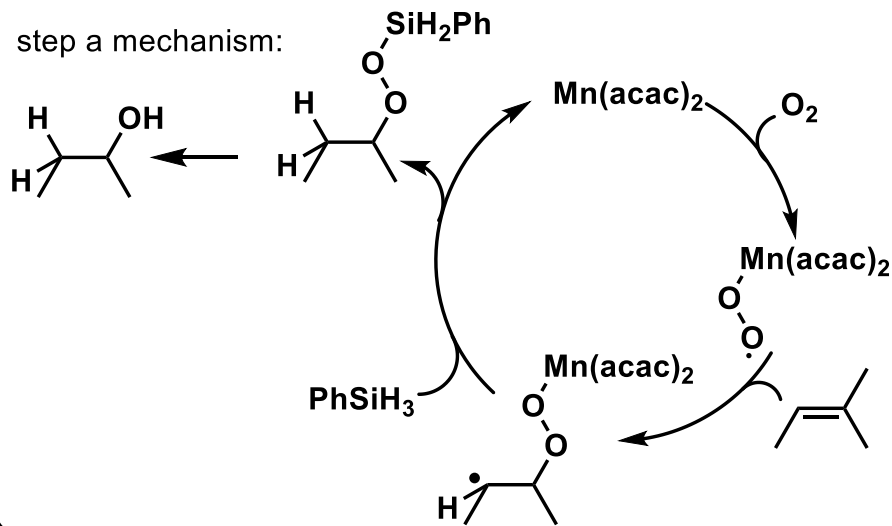




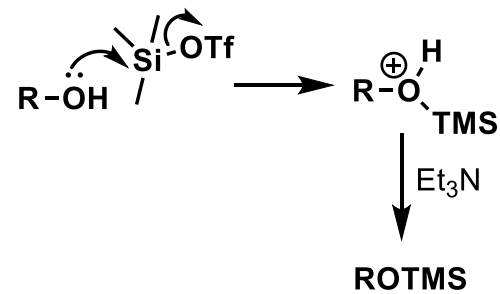
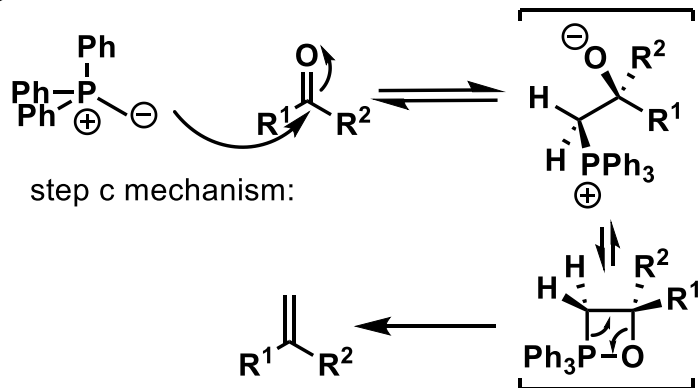
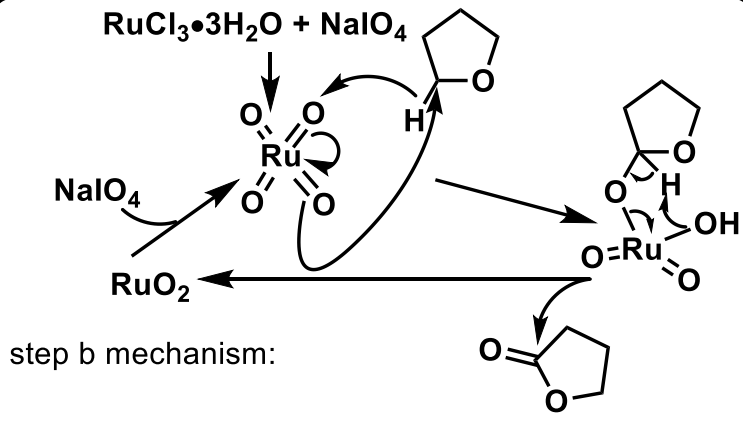
Mechanism from 8 to 7:

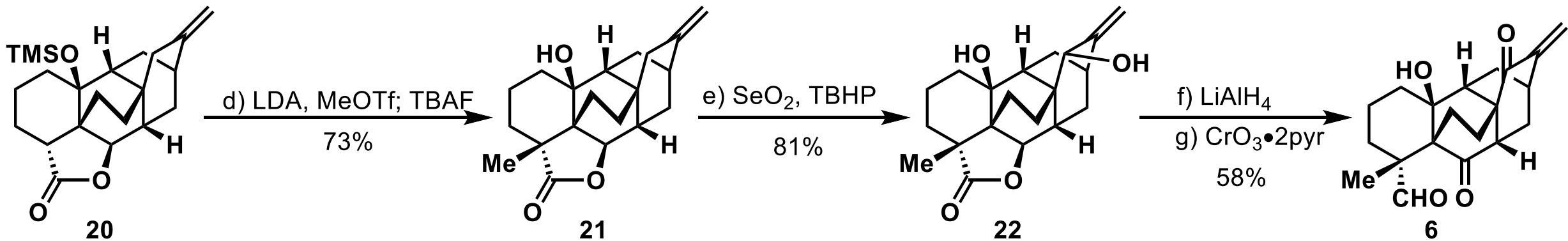


step a mechanism:

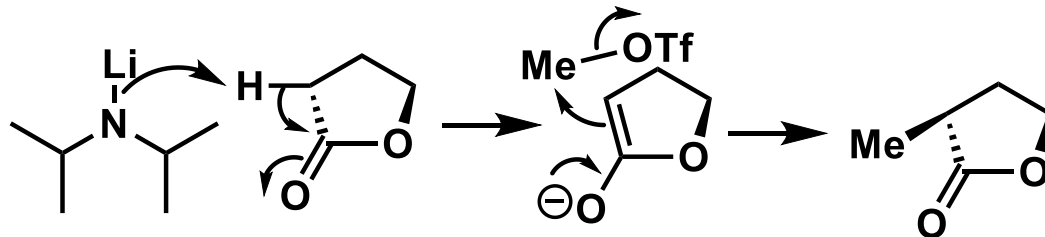


$\text{RuCl}_3 \cdot 3\text{H}_2\text{O} + \text{NaIO}_4$

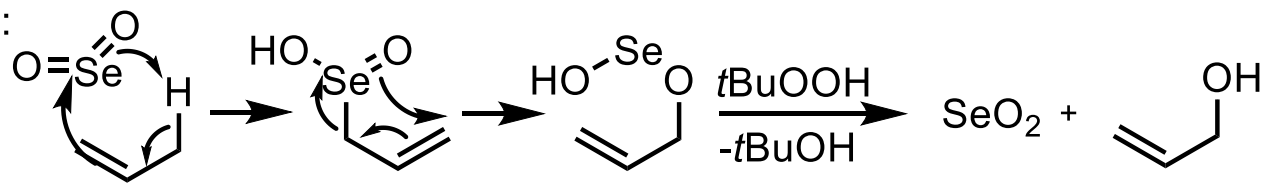




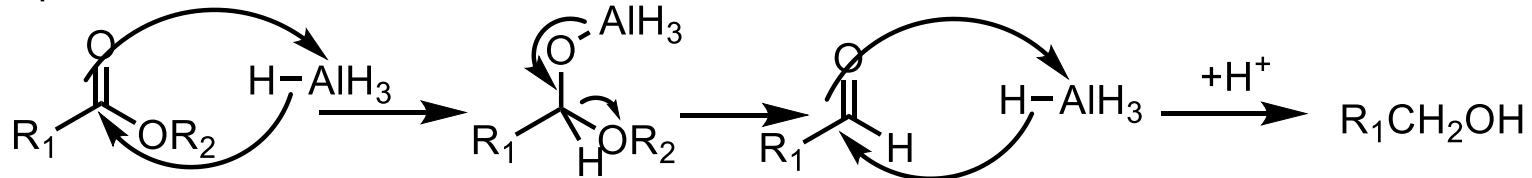
step d  
mechanism:



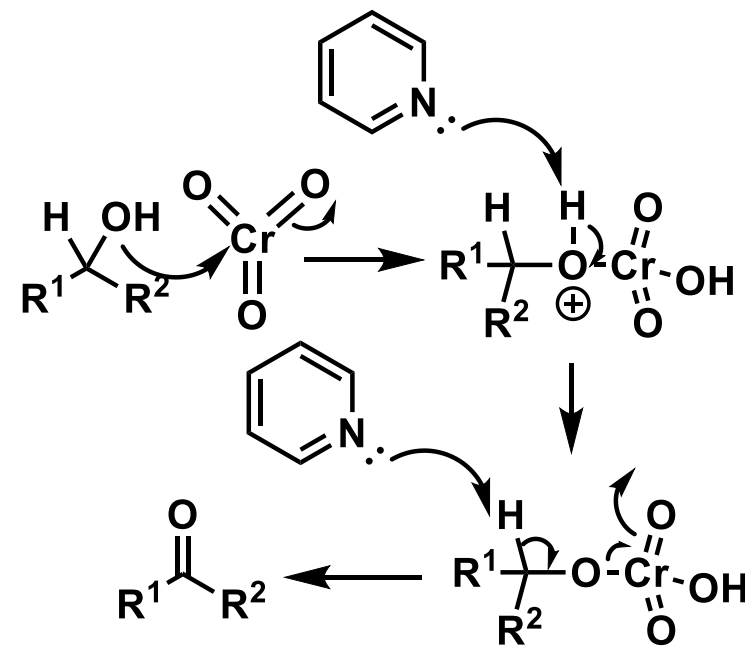
step e  
mechanism:

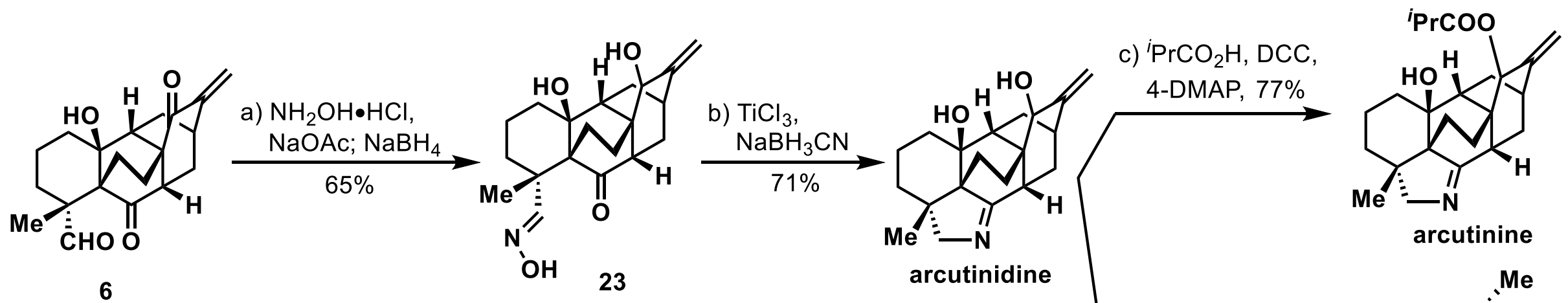


step f  
mechanism:

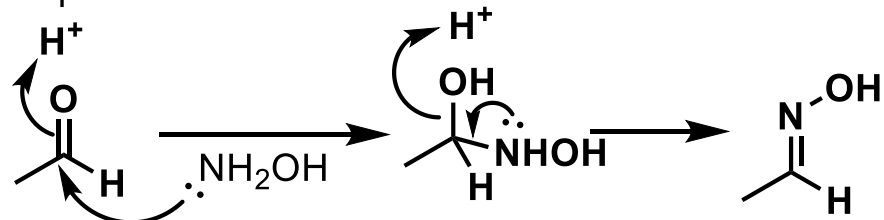


step g  
mechanism:

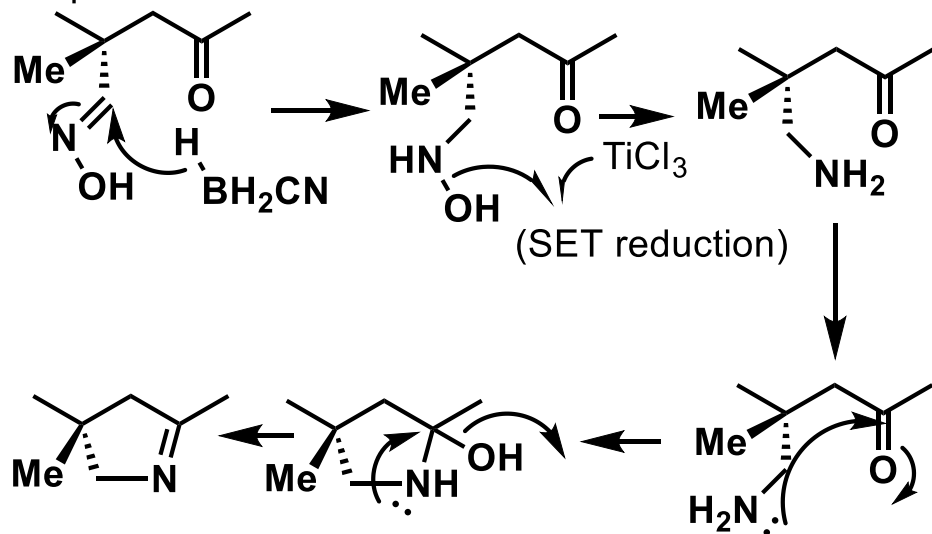




step a mechanism:



step b mechanism:



step c&d mechanism:

