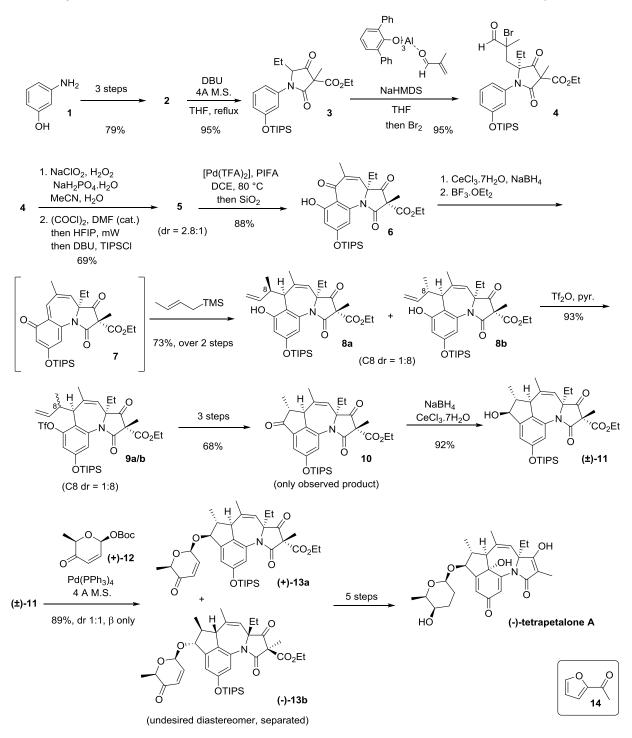
## Total Synthesis of (-)-Tetrapetalone A

## Submitted by Melinda



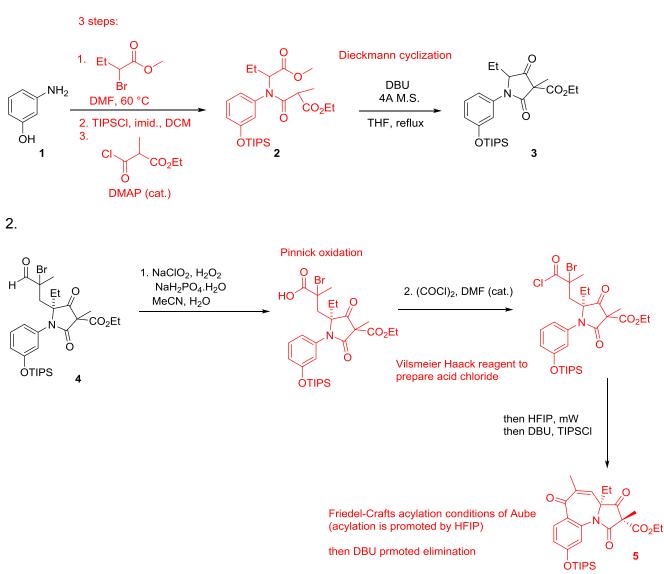
- 1. Give the missing structure 2 and the steps to get lactam 3 from 3-aminophenol (1)
- 2. Give the structure of compound **5** and the mechanism of its formation (HFIP = hexafluoro-isopropanol)
- 3. Propose mechanism to form compound 6 (PIFA = phenyl iodine bis(trifluoroacetate)
- 4. Propose steps to get tetracyclic ketone **10** from **9**
- 5. Explain the mechanism for the formation of diastereomers (+)-13a and (-)-13b. How would you synthetize pyranone 12 from acylfuran 14 (3 steps)?

## Total Synthesis of (-)-Tetrapetalone A – Solutions

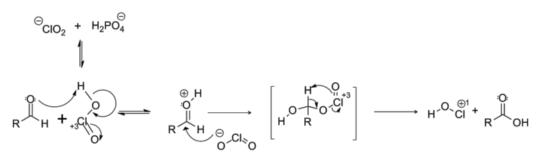
## Submitted by Melinda

Dhanjee, H. H.; Kobayashi, Y.; Buergler, J. F.; McMahon, T. C.; Haley, M. W.; Howell, J. M.; Fujiwara, K.; Wood, J. L. *J. Am. Chem. Soc.* **2017**, DOI: 10.1021/jacs.7b09358

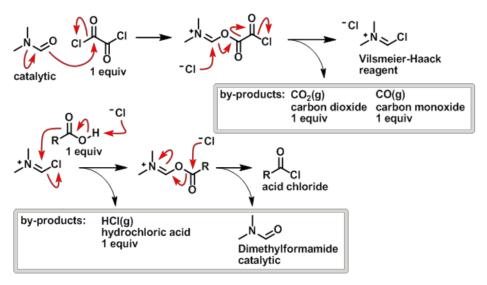




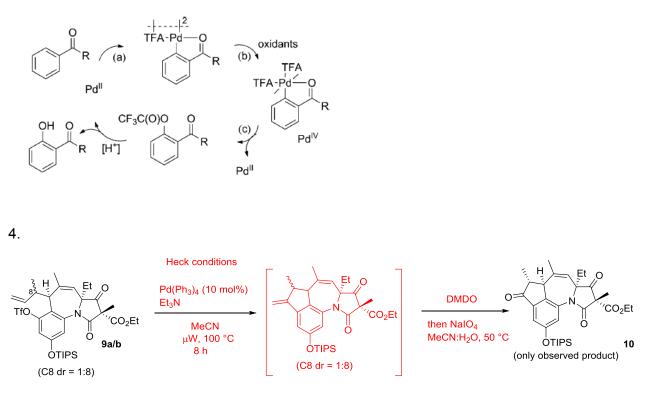
Pinnick oxidation:



Vilsmeier Haack reaction:

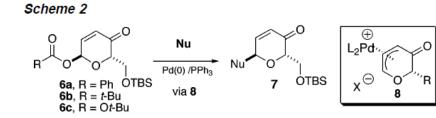


3. Shan, G.; Yang, X.; Ma, L.; Rao, Y. Angew. Chem. Int. Ed. 2012, 51, 13070.

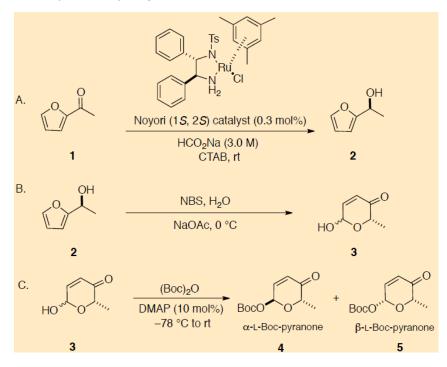


5.

a., The net overall retention in the palladium-mediated nucleophilic addition is attributed to retention of stereochemical integrity during both generation of the  $\pi$ -allyl-Pd intermediate and the subsequent addition of the nucleophile.



b., assymetric hydrogenation of the ketone-Achmatowicz reaction-hemiacetal protection



Achmatowicz reaction mechanism:

