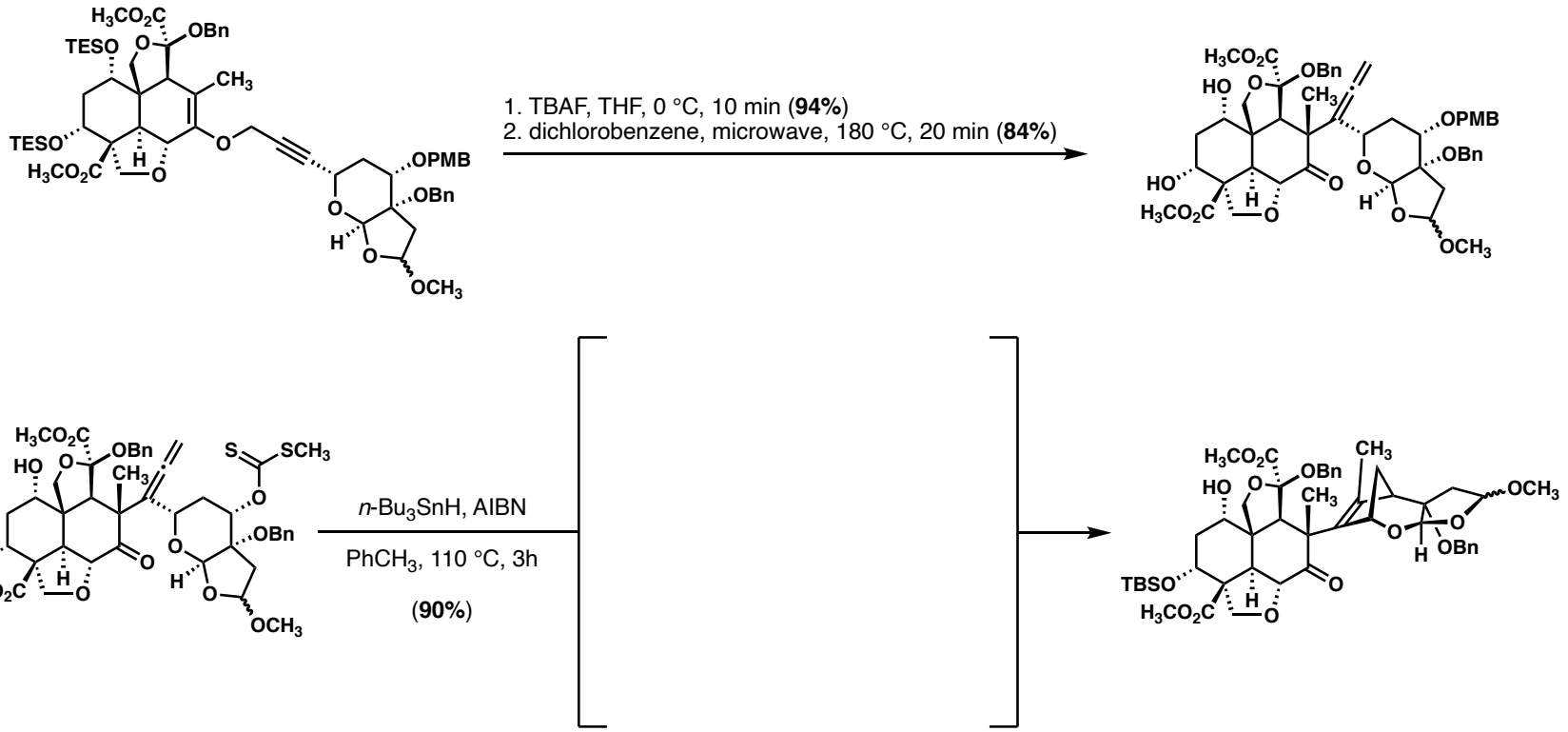
Dr. Marcel Achtenhagen and Ximing Li
Sorensen Problem Set Session
August 1, 2023

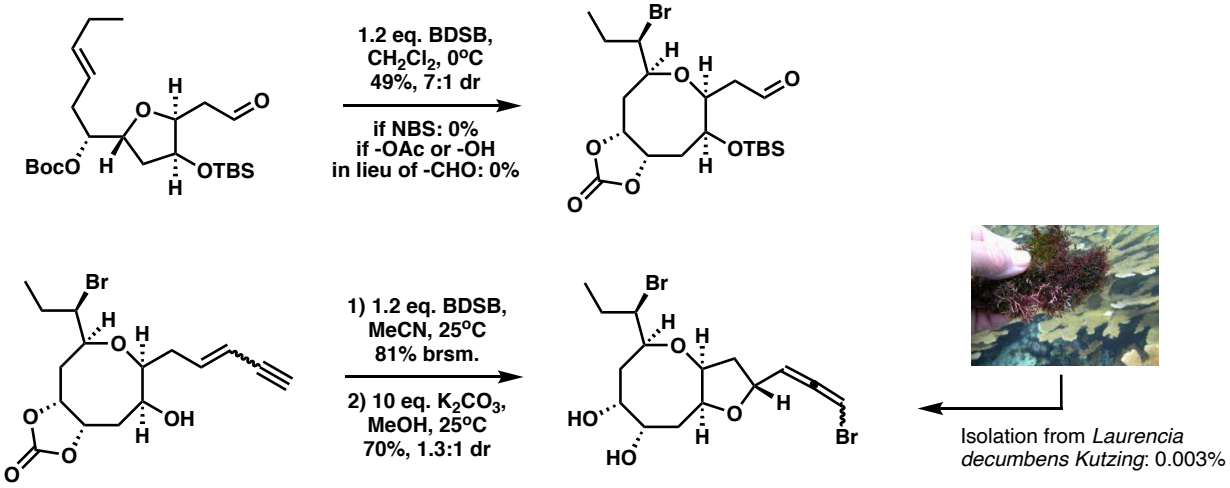
Problem Set

1. Provide reasonable mechanisms for each transformation shown below, if it is a named reaction please indicate. This example comes from the total synthesis of Azadirachtin from the Ley group in 2007. Angew. Chem. Int. Ed. **2007**, *46*, 7629.



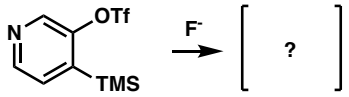
*2. Snyder group has synthesized varied members of Laurencia class of natural products featuring BDSD (Et_2S**Br**•$SbCl_5Br$) as essential reagent in generating much of the target's complexity.*

Try to explain the following transformation:

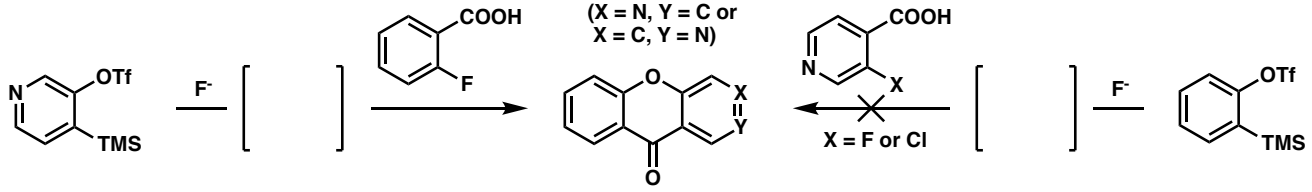


(The enantioselective total synthesis of laurendecumallene B. C. A. Taylor, Y.-A. Zhang, Scott. A. Snyder. Chem. Sci. ***2020****, 11,* 3036;
General Synthetic Approach for the Laurencia Family of Natural Products Empowered by a Potentially Biomimetic Ring Expansion. Y.-A. Zhang, N. Yaw, Scott. A. Snyder. JACS ***2019****, 141,* 7776*)*

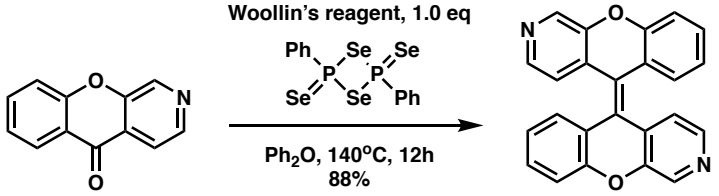
3. (for undergraduate) You've learnt in previous problem set that:



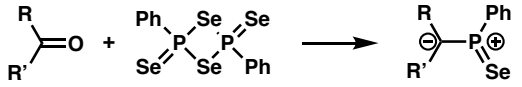
Now, try to explain:



and:



given a non-Lawesson type first step. (optional: why?)



(A Rapid Synthesis of Nuclear-Staining Small Fluorescent Molecules for Brain Imaging. S.-E. Suh et al. Cell. Reports. Phys. Sci. ***2020****, 1,* 100227*;*
Stereoselective Synthesis of Olefins by a Reductive Coupling Reaction. G. Hua et al. Dalton Trans. ***2007****,* 1477*;*
Why Nature Chose Selenium. H. Reich, R. Hondal, ACS Chem. Biol. ***2016****, 11,* 821*.)*