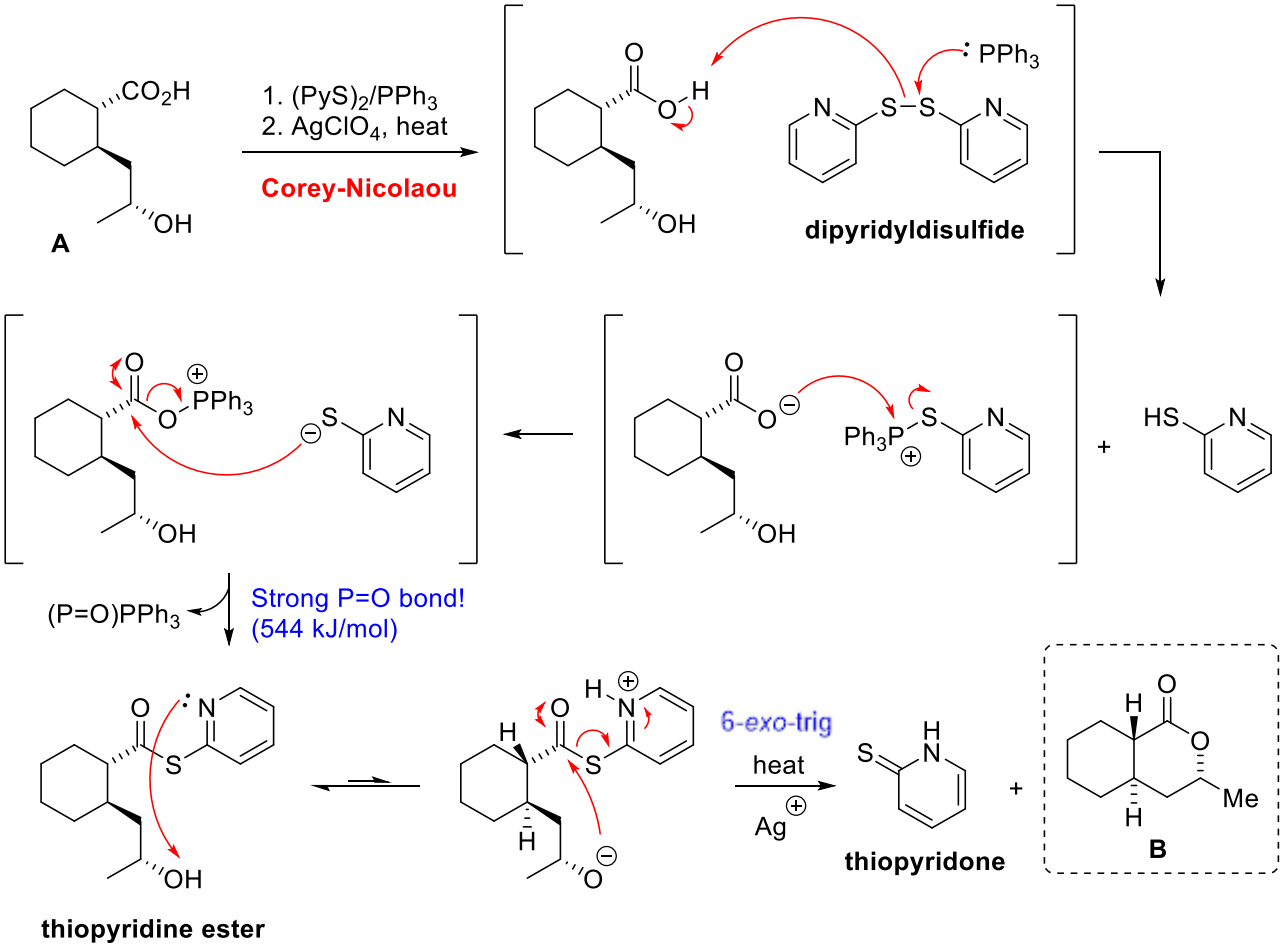
SR2024 POW5 – Solutions

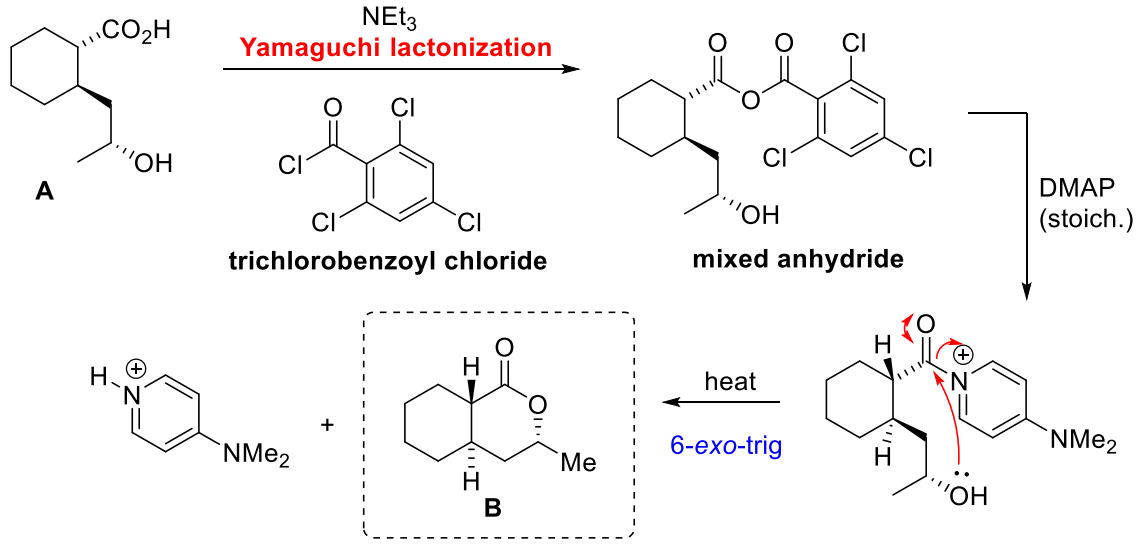
I)

Product **B** arises from cyclization with <u>retention</u> of the configuration of the hydroxyl group -> the carboxylic acid must be activated, for example with the ***Corey-Nicolaou*** method (via the thiopyridine ester) or the ***Yamaguchi*** lactonization (with trichlorobenzoyl chloride).

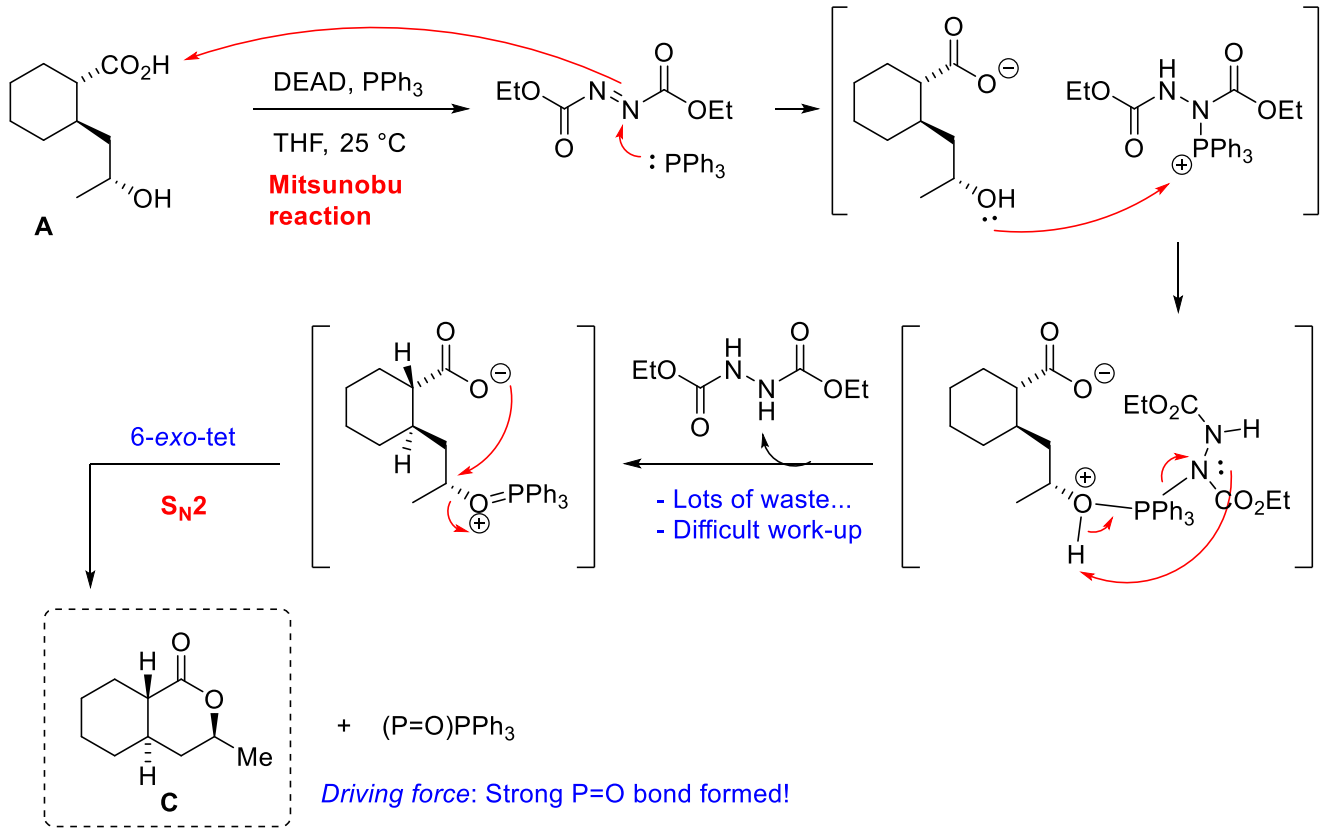


The cyclization reaction needs high temperature, but adding siver salts can result in a dramatic acceleration (by activating the thiopyridine ester --> even more elctrophilic).

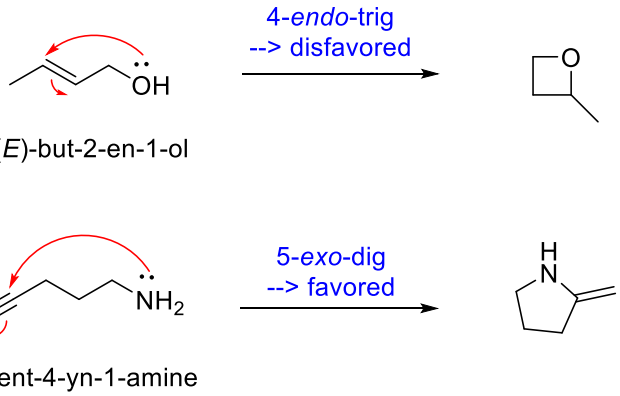
Option 2 for retention during lactonization (via acid activation):



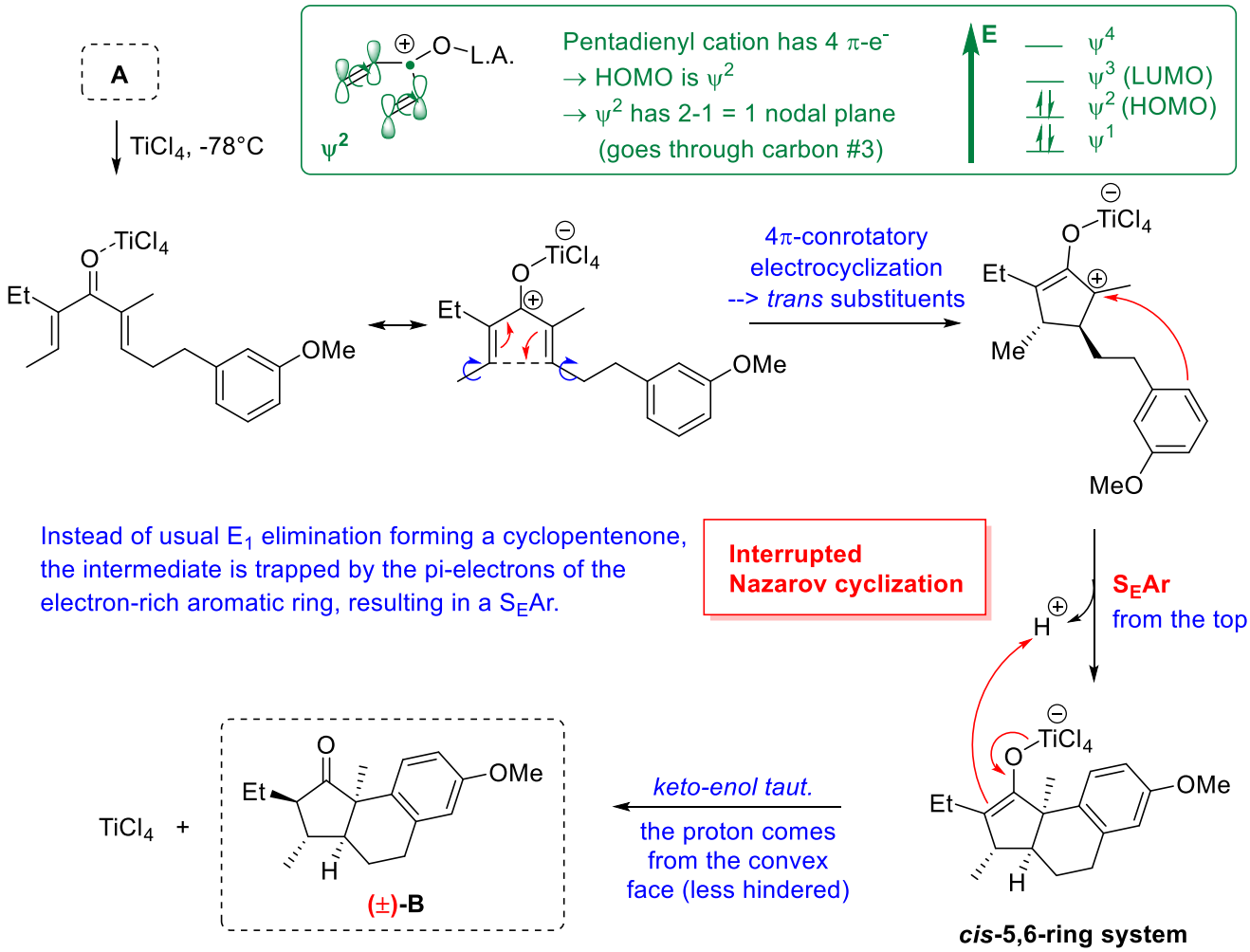
Product **C** arises from cyclization with inversion of the configuration of the hydroxyl group -> the hydroxyl group must be activated for the reaction to proceed under a clean S_N2 - mechanism, using the ***Mitsunobu*** reaction:



II)



III)



The conrotatory process can proceed in two ways
→ we end up with a racemate!