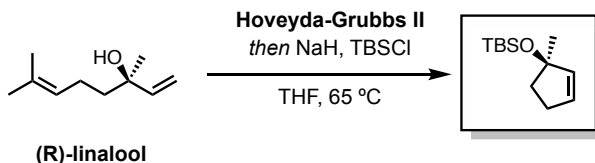
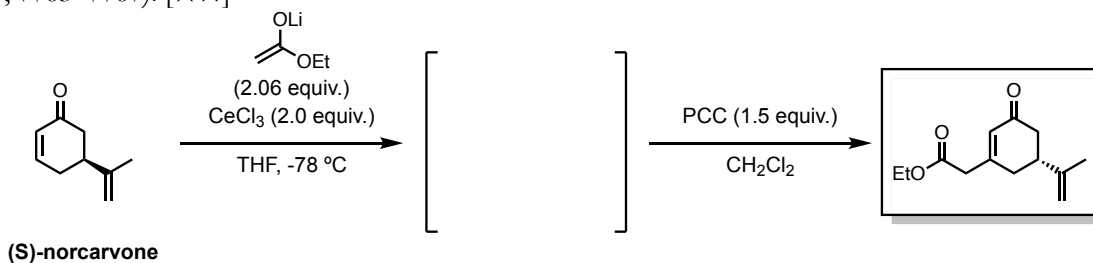


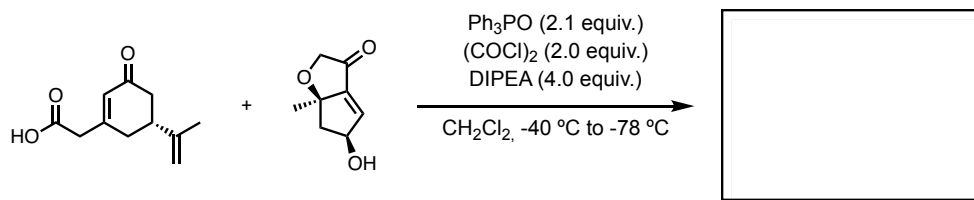
1. Propose and explain a plausible mechanism for the following catalytic cycle. Draw the structure of the catalyst employed. What is the name of this transformation? (*J. Am. Chem. Soc.* **2023**, *145*, 7763–7767). [★]



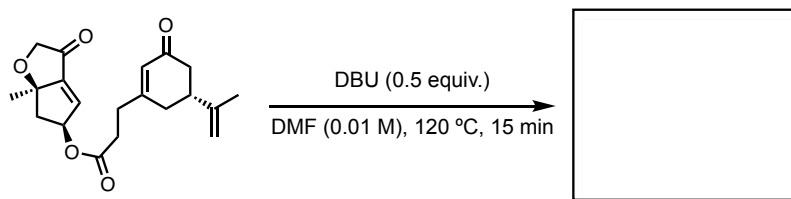
2. Draw the structure of the intermediate, and propose a plausible mechanism for the following transformation (*J. Am. Chem. Soc.* **2023**, *145*, 7763–7767). [★★]



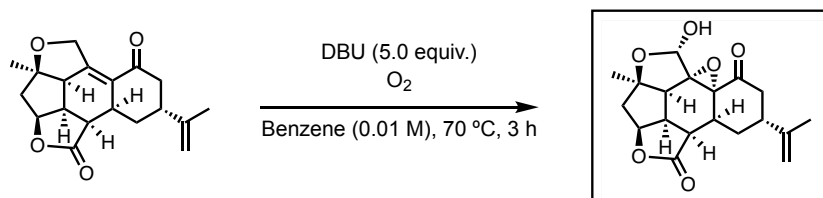
3. Identify the product and propose a plausible mechanism (*R. Soc. Open Sci.* **2018**, *5*, 171988). [★★]



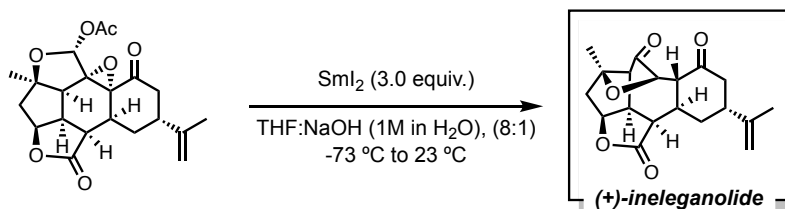
4. Identifying the product of the following transformation and propose a plausible mechanism. What is the role of DBU? Are you able to name the reactions involved? (*J. Am. Chem. Soc.* **2023**, *145*, 7763–7767). [★★★]



5. Propose a plausible mechanism for the following transformation. What is the role of oxygen in this reaction? (*J. Am. Chem. Soc.* **2023**, *145*, 7763–7767). [★★]



6. **(Endgame)** Propose a plausible mechanism for the final step in the Total Synthesis of this episode. What is the name of this transformation? (*J. Am. Chem. Soc.* **2023**, *145*, 7763–7767). [★★★]



- 6.1. **BONUS:** Now that you have identified the above transformation, draw the structure of the missing intermediate and propose a plausible for the second step. These steps have been extracted from the Total Synthesis of Isoedunol and β -Araneosene reported by Kingsbury and Corey in 2005. Rationalize why the Swern oxidation step is necessary to afford this product. (*J. Am. Chem. Soc.* **2005**, *127*, 13813–13815).

