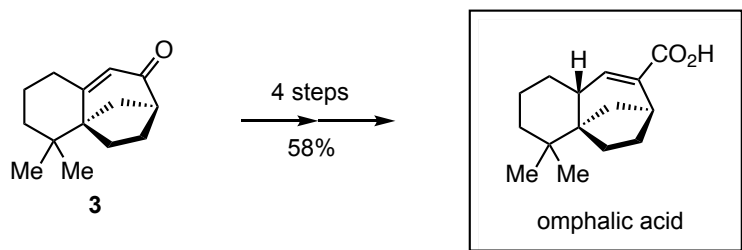
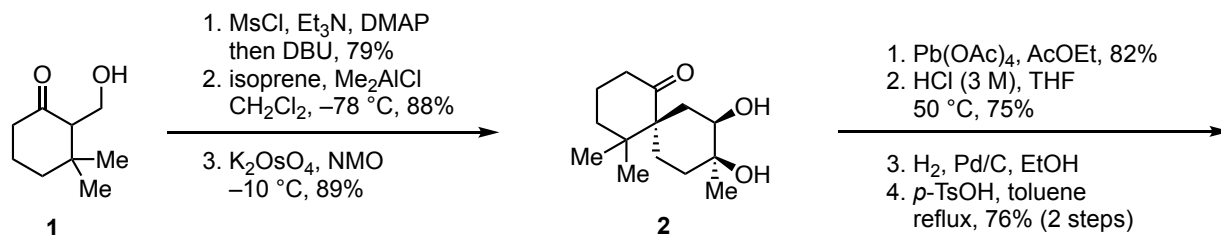
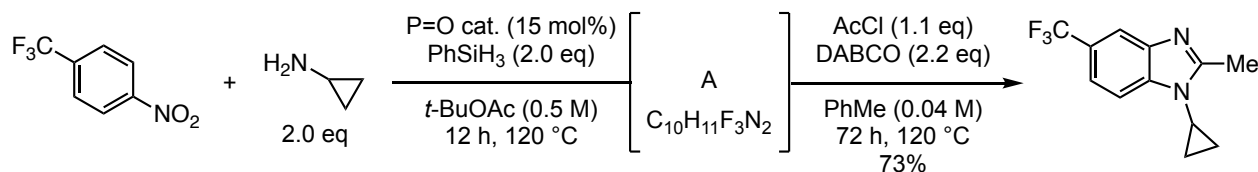


- Q1. (B3–M1) Propose a synthetic route from commercially available materials.
 Q2. (B3) Propose reasonable arrow-pushing mechanisms (**1** → **2** → **3**).



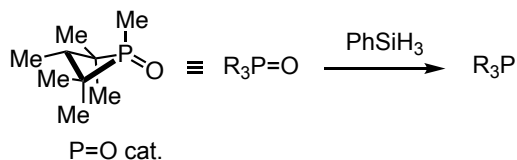
Zhang, Y. *et al. Org. Lett.* **2021**, *23*, 6972–6976.

- Q. (B4, M1,2) Propose reasonable intermediate A and mechanisms of the following transformations.



Hint

Initiation step



Gen Li, Marissa N. Lavagnino, Siraj Z. Ali, Shicheng Hu, and Alexander T. Radosevich*
J. Am. Chem. Soc. **2023**, *145*, 41–46.