**Exercise 2023-02-16**

1. Please provide the plausible mechanism for the following transformation. (*J. Am. Chem. Soc*. **2002**, *124*, 12650–12651).



1. Please provide the plausible mechanism for the following transformation. (References: *Angew. Chem. Int. Ed*. **2019**, *58*, 14157–14161; *Org. Lett.* **2021**, 23, 1572−1576; *Science* **2023**, *379*, 484–488.)



1. Asymmetric Total Synthesis of (−)-Vinigrol. (*J. Am. Chem. Soc*. **2019**, *141*, 15773−15778). Please find the structures of the missing compounds (**A**-**L**), propose a mechanism for the formation of **I** from **G**, and the last step condition for the formation of (−)-Vinigrol.

