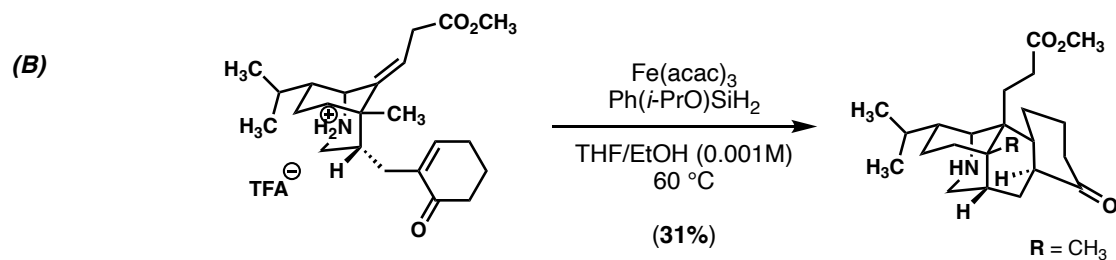
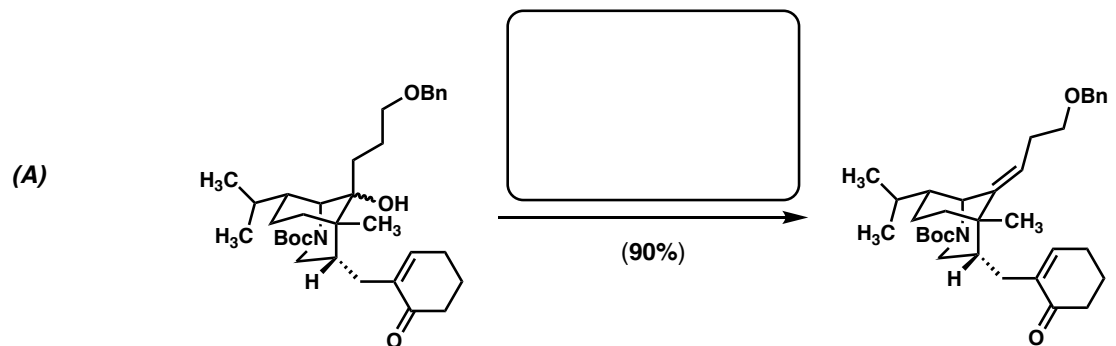


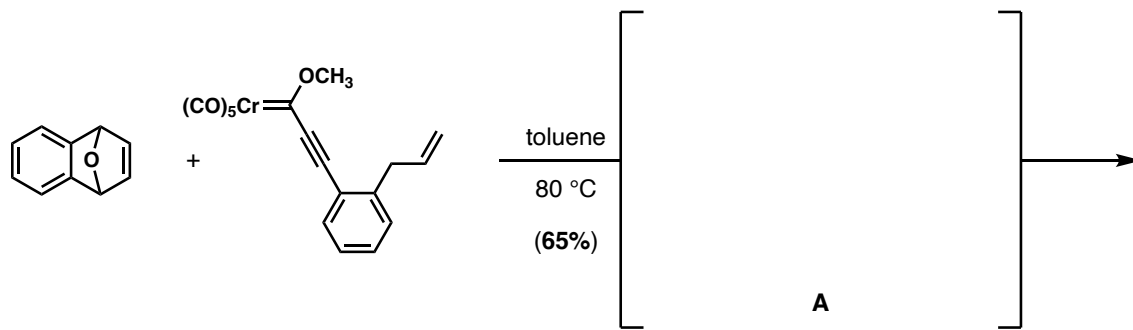
**Problem Set**

1. During their efforts towards a total synthesis of (-)-Daphnezomines A and B, Chao Li and coworkers utilized a rather challenging cyclization as well as a named protocol for dehydration. Provide both the named reaction as well as the mechanism for dehydration. Then also provide what type of cyclization according to Baldwin's rule is being used as well as the mechanism. Chao Li, *J. Am. Chem. Soc.*, 2020, **142**, 15240-15245. **Hint:** the dehydrating agent was invented at Georgia Tech in 1968.



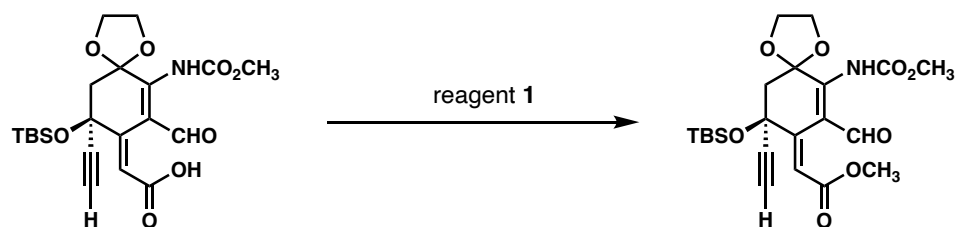
**Problem Set**

2. Using Cr as the work horse, Barluenga and coworkers showed some really interesting chemistry. Provide the intermediate **A**, the final product, as well as a reaction mechanism from the starting material to the product. *J. Am. Chem. Soc.* **2002**, 124, 10978-10979. **Hint:** intermediate **A** is a strained metallocycle.



**Problem Set**

3. During the total synthesis of ( $\pm$ )-Calicheamicinone by Meignan and coworkers, they required a protocol for the esterification of a sensitive aldehyde acid. The reagent they chose allowed them to generate diazomethane *in situ*. Provide a mechanism and name for the reagent used. What is the BDE of the reactive bond in reagent 1? *J. Am. Chem. Soc.*, **1998**, 120, 10332-10349.



Diazald 1

**Problem Set**

4. Provide the mechanism for the following transformation. *Adv. Synth. Catal.* **2018**, 360, 3460-3465.

