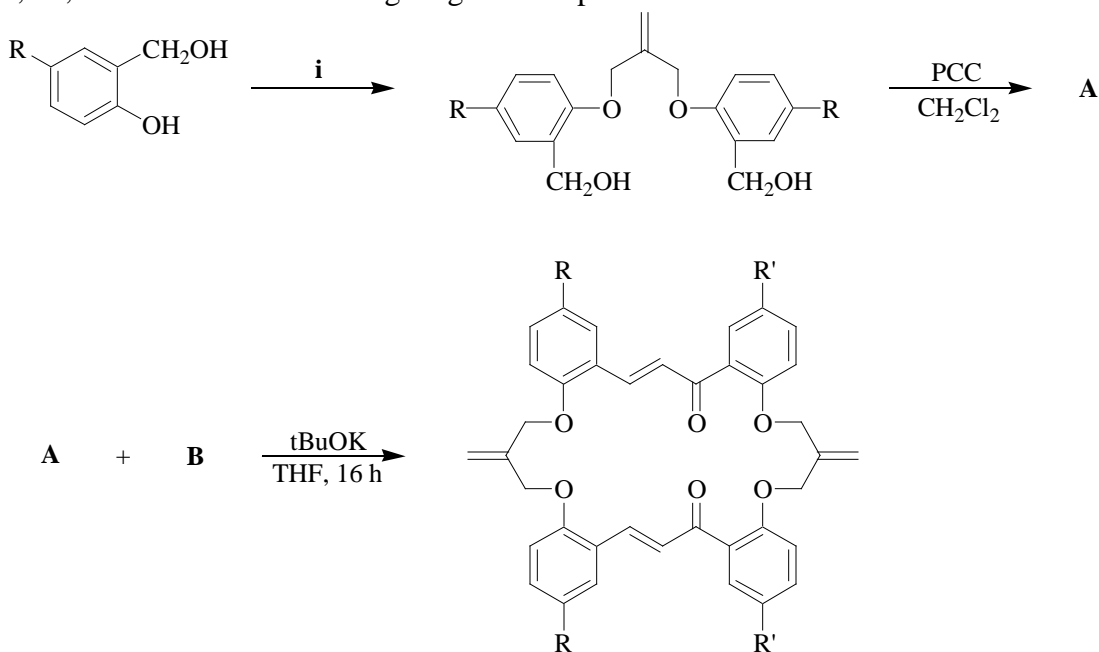


## Problem Set #10

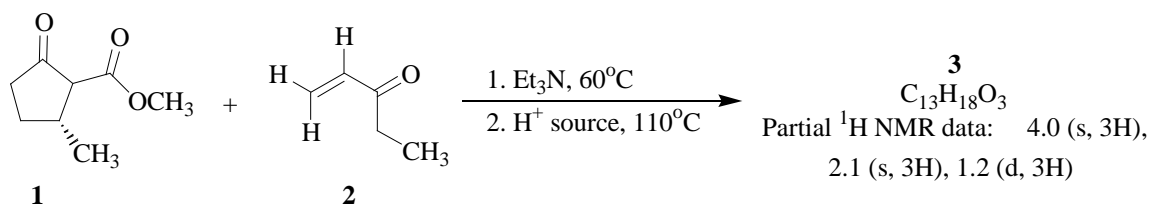
Chemistry 3231

November 7, 2001

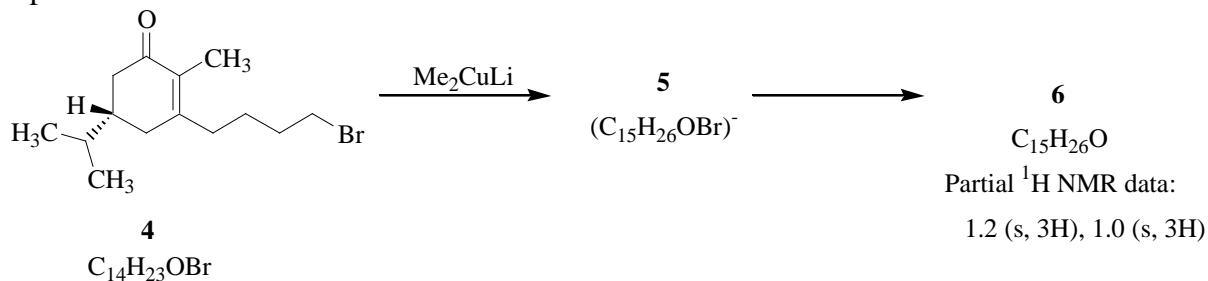
1. The following synthesis is taken from a recent paper: Rao, M. L. N., et al. *Tetrahedron Lett.* **2001**, 42, 8351. Fill in the missing reagents and products.



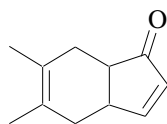
2.  $\alpha$ -Ketoester **1** is treated with a base (triethylamine) and reacted with ethyl vinyl ketone (**2**). The product of this Michael addition was heated in the presence of acid, giving product **3**. Propose a structure for compound **3**. Partial NMR data is given for the product. (Ref: Overman, et al. *J. Am. Chem. Soc.* **1998**, 119, 4039.)



3. Treatment of enone **4** with dimethylcuprate leads efficiently to a single product, **6**. What are the structures of intermediate **5** and the final product **6**? Partial  $^1\text{H}$  NMR data of **6** is provided.

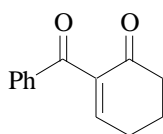


4. Use both the Diels-Alder and aldol reactions to propose an efficient synthetic sequence for the preparation of **7**. You may use compounds of six or less carbons.

**7**

5. Show the synthetic strategy (retrosynthetic analysis) for the preparation of the following compounds (it is not necessary to show the actual reagents).

(a)



(b)

