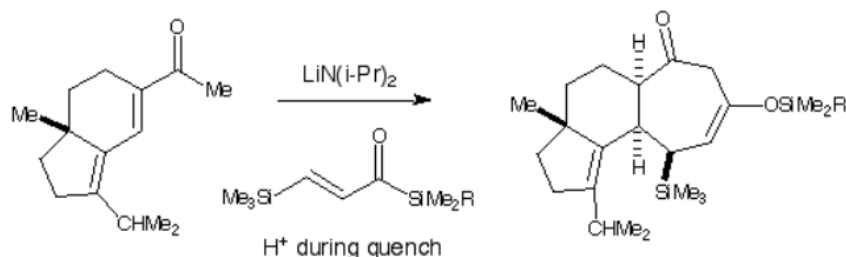


**Dr. Andrea Group Meeting – Fun Problem Set ☺**  
**(Credit: Dr. Evans CCB Problem Sets)**

**Problem 1**

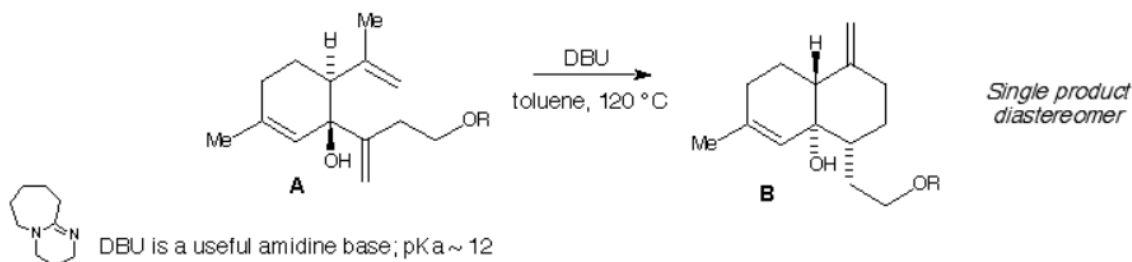
Takeda and co-workers have recently reported the mechanistically interesting ring extension reaction illustrated below (*Org. Lett.* **2000**, 2, 1903).



Provide a plausible mechanism for this transformation in the space below.  
 Ignore the stereochemical aspect of this transformation.

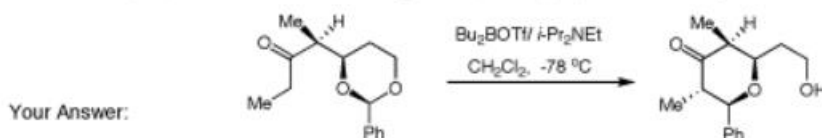
**Problem 2**

The following transformation was recently reported by Barriault and Dean in conjunction with their synthesis of arteannuin M (*Org. Lett.* **2001**, 3, 1925-1927). Provide a mechanism for the illustrated thermal rearrangement(s) of **A** to **B**. Where stereochemical issues are at stake, provide clear three dimensional drawings to support your answer.



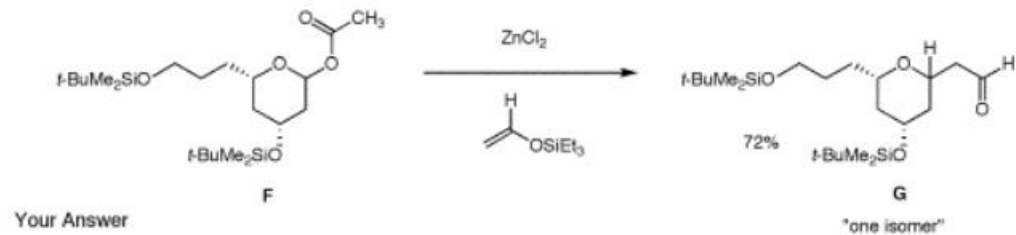
**Problem 3**

Please provide a rationale for the stereoselective synthesis of cyclic ethers in a single step shown by Sinha and coworkers (*Org. Lett.* **2004**, 6, 123). Be sure to provide clear 3D drawing to account for the observed stereoselectivity. (Note: An excess of  $\text{Bu}_2\text{BOTf}$  (> 2 equiv) is necessary for the reaction to proceed.)



## Problem 4

In Amos Smith's synthesis of the natural product, phorbaxazole, (*J. Am. Chem. Soc.* **2001**, 123, 10942) the following acetate **F** was treated with  $\text{ZnCl}_2$  and an enolsilane to afford pyran **G**. Provide a mechanism for this reaction and indicate what is the predominant diastereomer by providing a detailed depiction of the transition state. Assume an aqueous workup of the reaction.

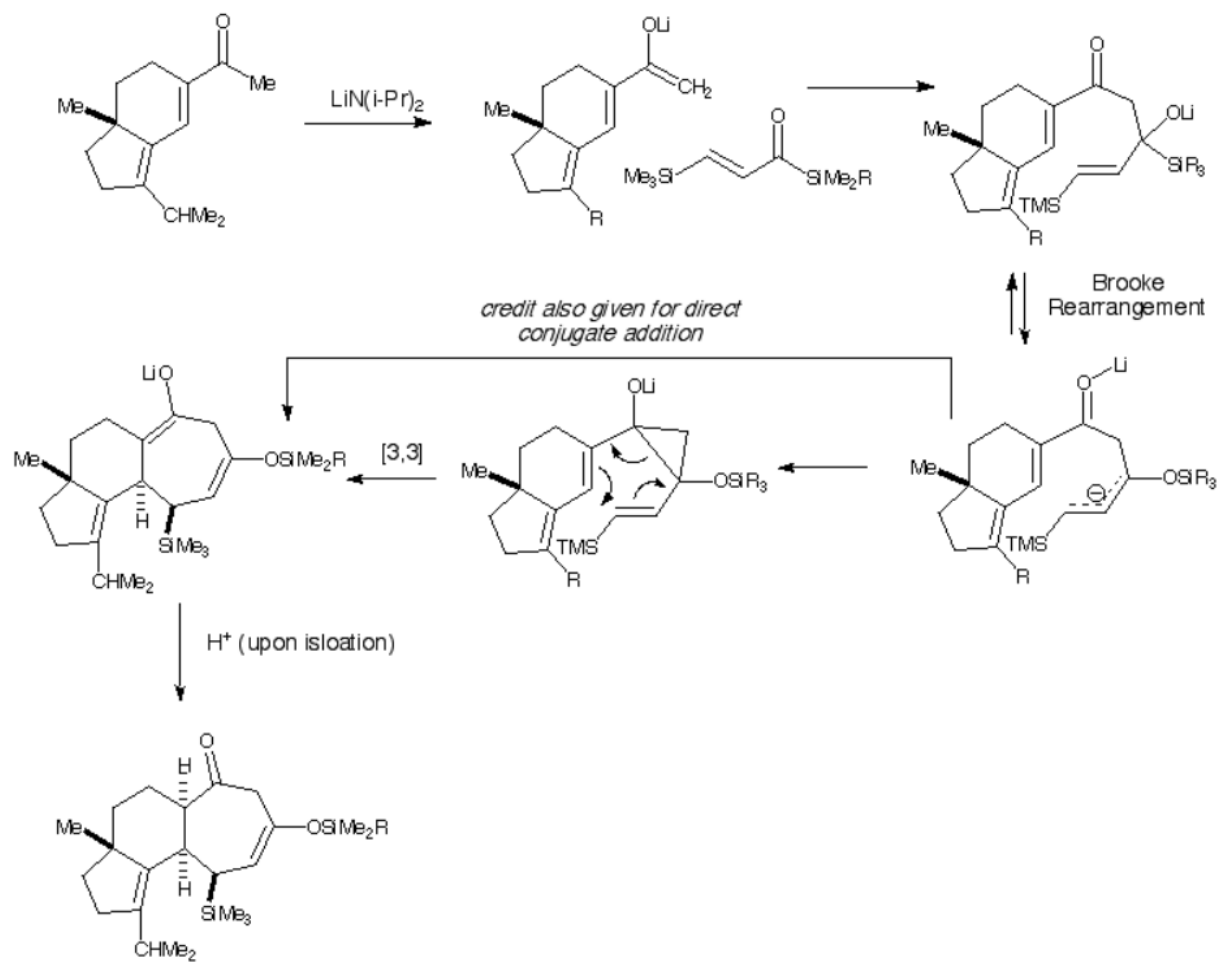


Your Answer

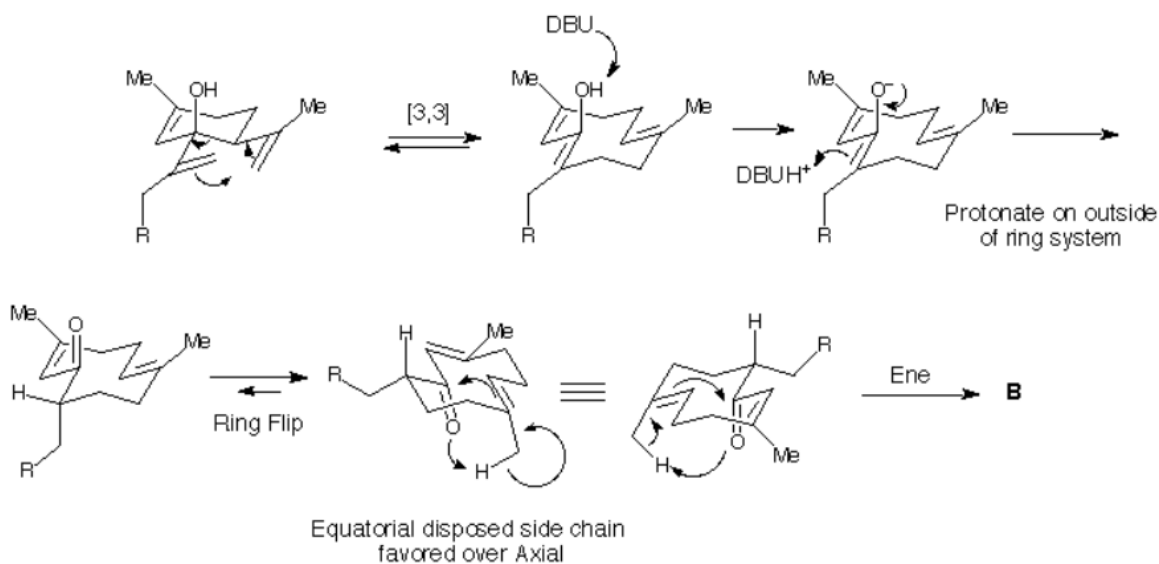
"one isomer"

# Answer Key

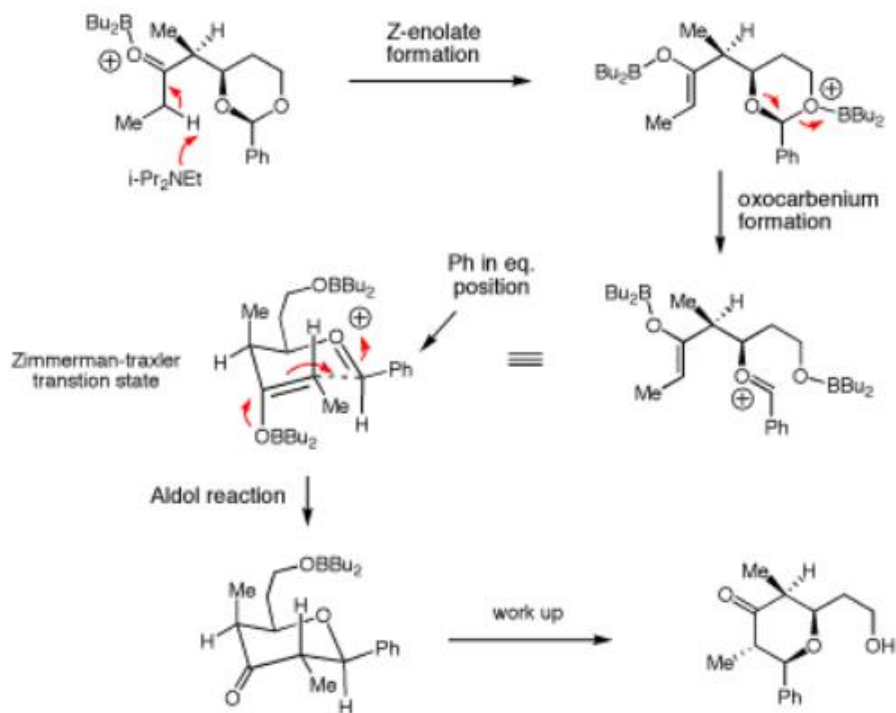
## Problem 1



## Problem 2



## Problem 3



## Problem 4

