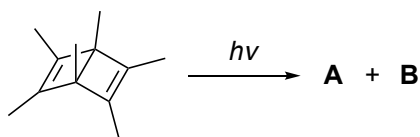


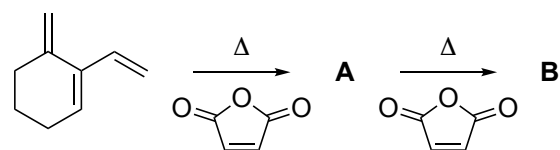
### CH 105 - Tutorial 3

1. Write the products for the following transformations. Clearly mention the stereochemistry of the products.

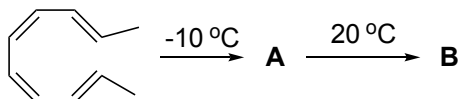
a.



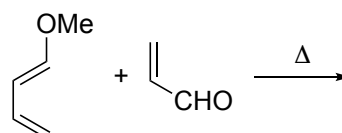
b.



c.

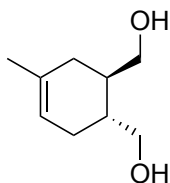


d.

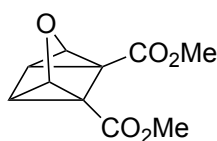


2. Give appropriate reagents, reaction conditions and starting materials (if not provided) to synthesize the following molecules.

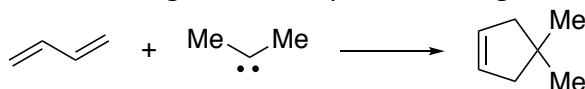
a.



b.

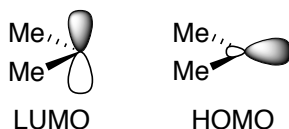


3. The reaction given below passes through a five-membered transition state (TS).



a. Draw the HOMO-LUMO of diene involved.

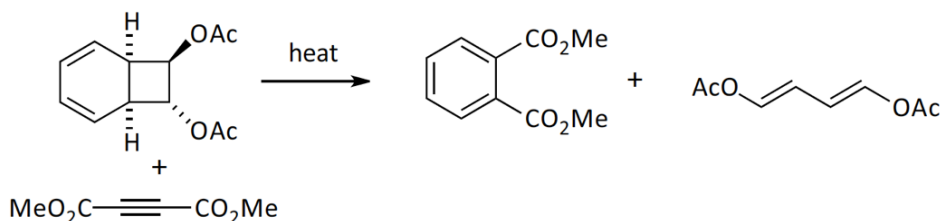
b. Show **both possible** combinations of orbital interactions between diene and carbene (HOMO and LUMO given below) responsible for the product formation.



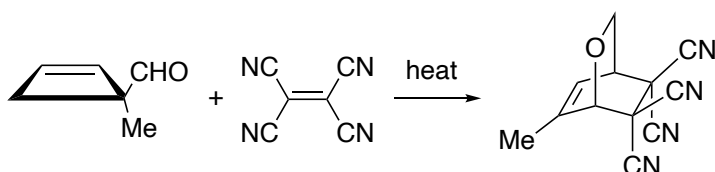
(Note: It is an example of cheletropic reaction, which you need not know or remember for solving this question!).

4. Write a reasonable mechanism for the following reactions. Identify the missing products if any. Indicate the regio-/stereo-chemistry of the products and reaction intermediates wherever applicable. Your mechanism should give proper description of the pericyclic processes involved.

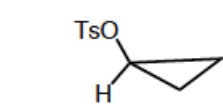
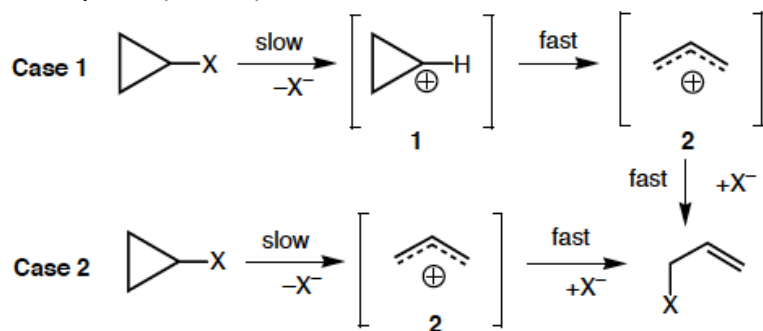
a.



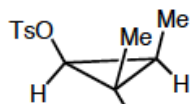
b.



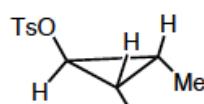
5. Does solvolysis proceed *via* cation 1 followed by rearrangement to 2 (Case 1), or does it proceed directly to 2 (Case 2)?



relative rate  
1



4



40,000

(Ref: DePuy, *Acc. Chem. Res.* **1967**, 1, 33)