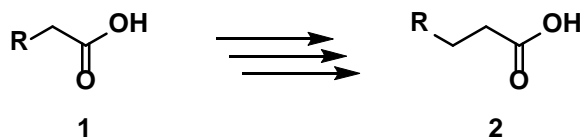




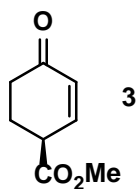
2. **Problem:** Use the Arndt-Eistert method to synthesize compound **2** from starting material **1**. For each step of the pathway, please provide the mechanism of the reaction transformation(s). As a hint, there are 4 steps involved in the pathway. (15 PTS) [Notes]



Answer:



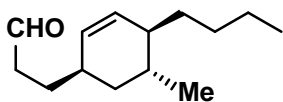
3. **Problem:** Make compound **3** using a [4 + 2] Diels-Alder cycloaddition reaction **AND** the incorporation of Danishefsky's diene into your synthesis. **(15 Points)**. [Notes]



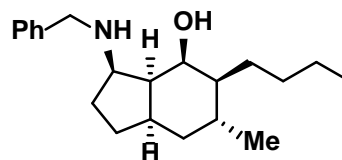
Answer:



4. **Problem:** Synthesize the **T.M.** below using the noted starting material and Prof. N. Lebel's nitrene chemistry (*JACS* **1984**, 106, 721). No mechanisms required. **(15 Points)**. [Notes]



Starting Material

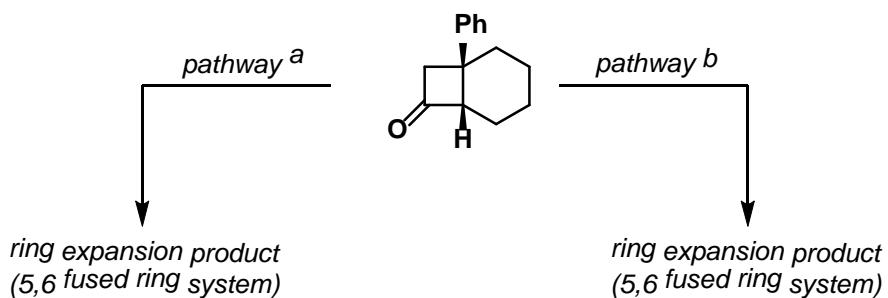


Target Molecule (T.M.)

Answer:



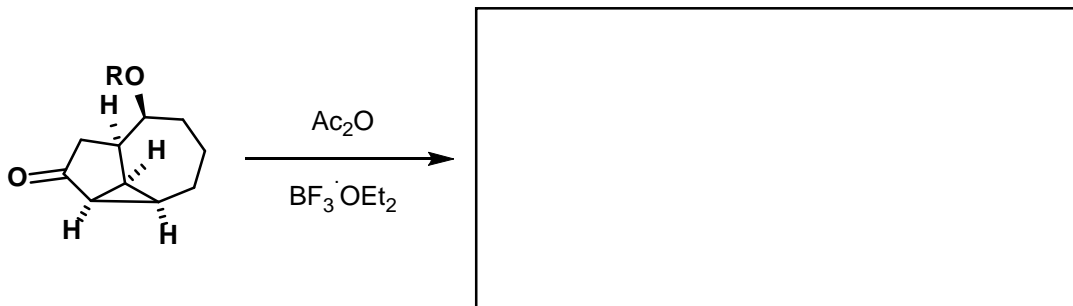
5. **Problem:** Provide two ways that compound **4** can be subjected to ring expansion. For 5 Bonus Points each, provide the names of those reactions. In any event, provide the mechanisms for each of those reactions. (15 PTS). [Notes]



Answer:



6. **Problem:** What will be the product of the following reaction? Provide the mechanism for the reaction. (15 PTS). [Notes]



Answer:



7. **Problem:** What will be the product of the following reaction? Provide the mechanism for the reaction. (15 PTS). [Notes]

