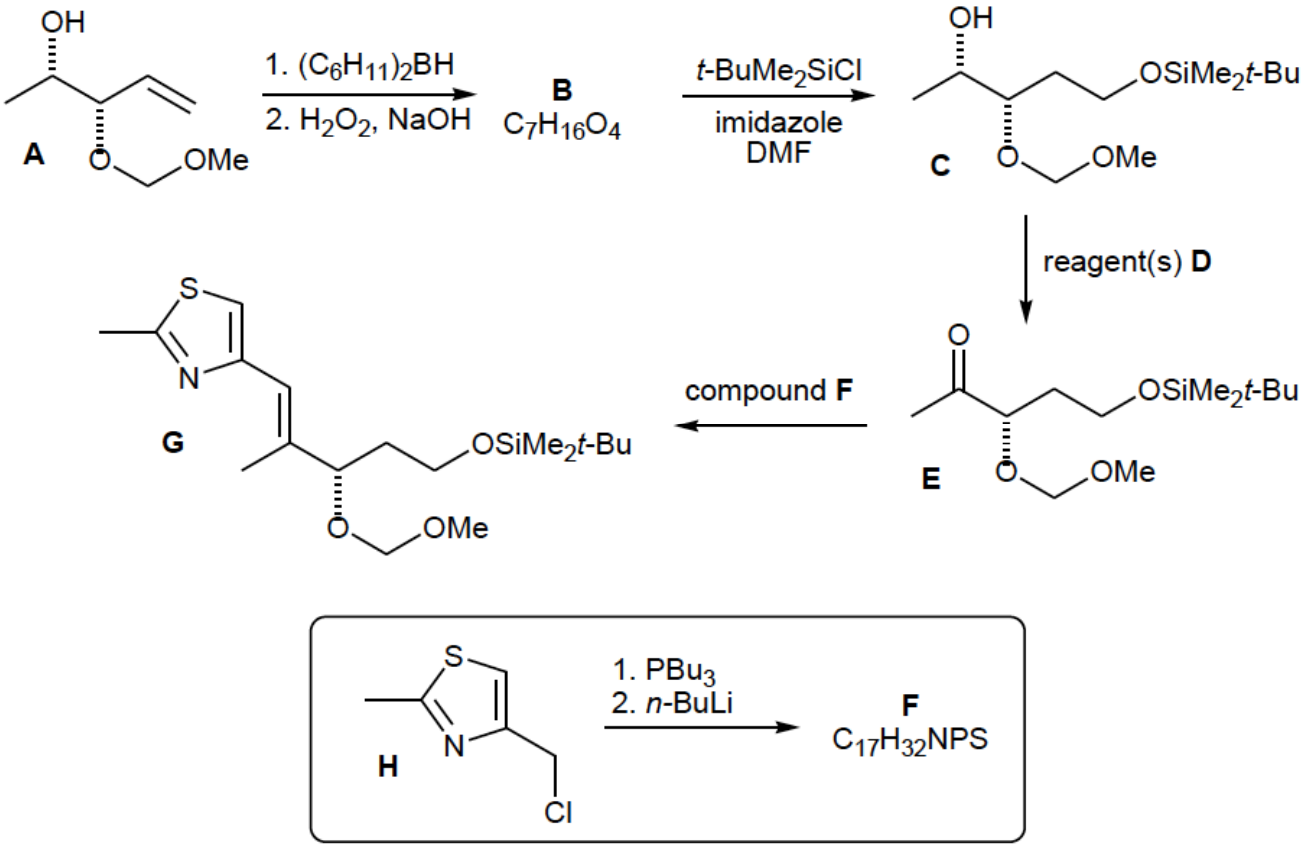
Name Last Name ID number

1. Answer part (a) and parts (b)-(c).

(a) A synthetic approach towards a fragment of an anti-cancer drug, epothilone-A, is shown below:

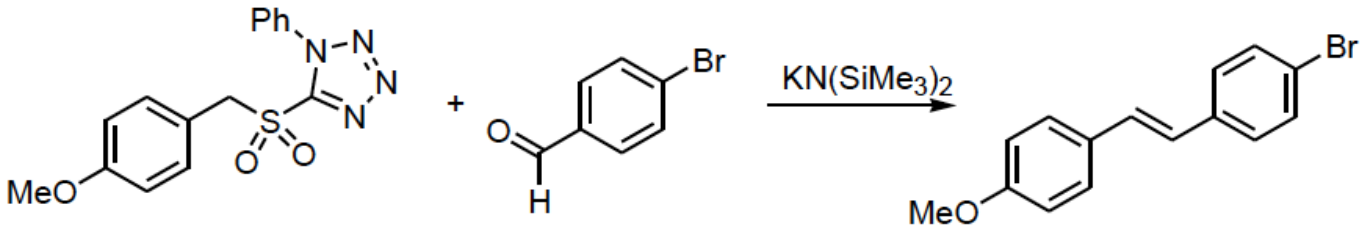


(i) Work out the structure of compound **B** and suggest a mechanism for its formation.

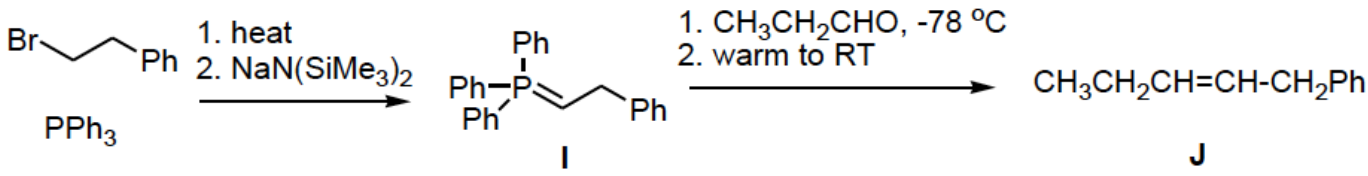
(ii) Suggest suitable reagent(s) **D** for the conversion of **C** → **E**.

(iii) Work out the structure of compound **F** and explain briefly the stereoselectivity of the conversion **E** → **G**.

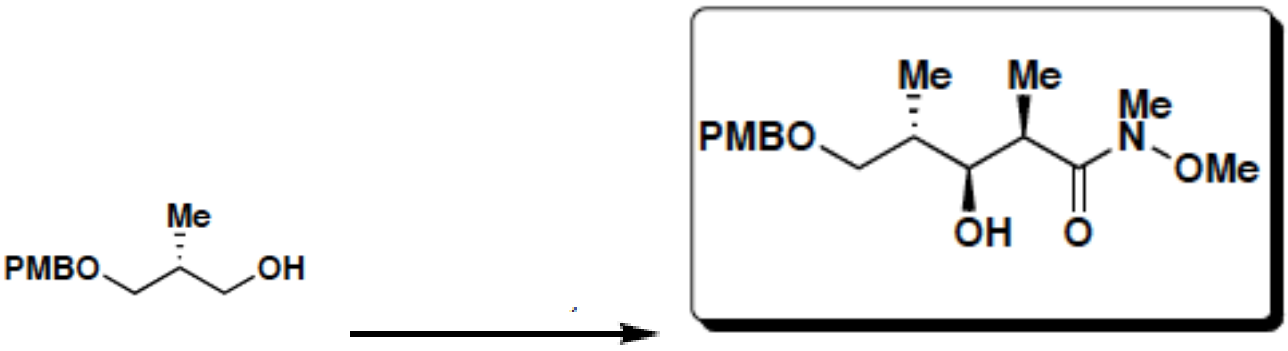
(b) The scheme below shows an example of the Julia-Kocienski alkene synthesis. Outline the reaction mechanism for this elimination, and account for the stereoselectivity of the elimination process.



(c) Using a reaction mechanism, show how ylid **I** can be made from the reagents given. With a brief explanation, predict the stereochemistry of the carbon-carbon double bond in **J**.



2. Provide the missing reagents or products for the following synthetic steps. Use as many synthetic steps as you feel are required. Pay particular attention to the stereochemistry.



3. When the illustrated amide is treated with bromine under basic conditions the following tranformation takes place. Write out a detailed mechanism which acconts for this transformation.