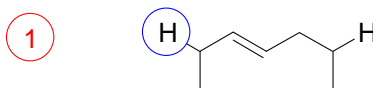


CHM 1321B
Mid Term 2 Version 2 Answers

1. a. Compare the two hydrogens shown in this compound and circle the one that is more acidic. (1 point)

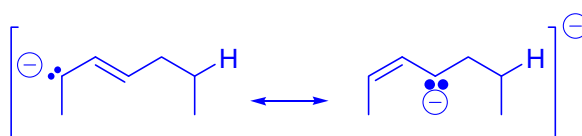


- b. Draw the two possible conjugate bases (2 points).



- c. For your answer to part b above, identify which of the conjugate bases is more stable and justify your answer (5 points)

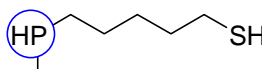
resonance is possible with the compound on the left (2)



resonance stabilizes conjugate bases by spreading out the charge (2)

structure on the left is more stable (1)

2. Compare the two nucleophiles shown in this compound



- a. circle the one that is more nucleophilic (1 point).
b. What is the fundamental definition of a nucleophile (1 Point)

Electron Pair donor

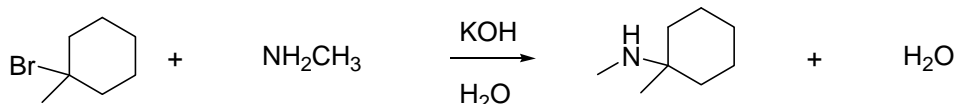
- c. Justify your answer to part a (4 points)

Sulfur is to the right of phosphorus on the periodic table (1 Point)

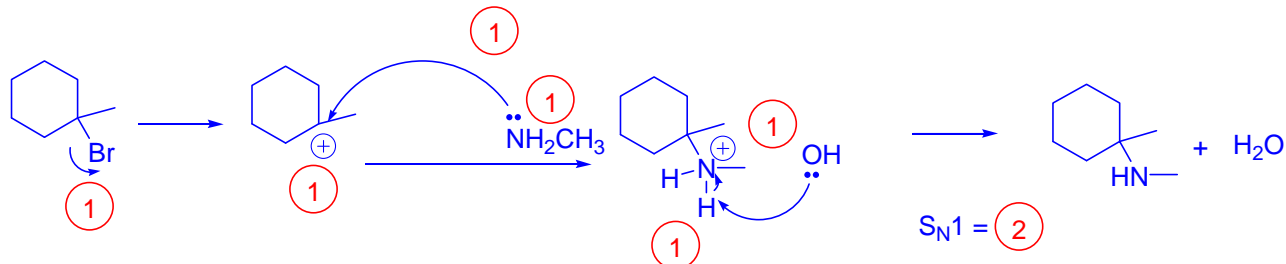
Sulfur is therefore more electronegative than phosphorus (1 Point)

The atom that is less electronegative holds electrons less tightly and therefore is more easily able to donate them (2 Point)

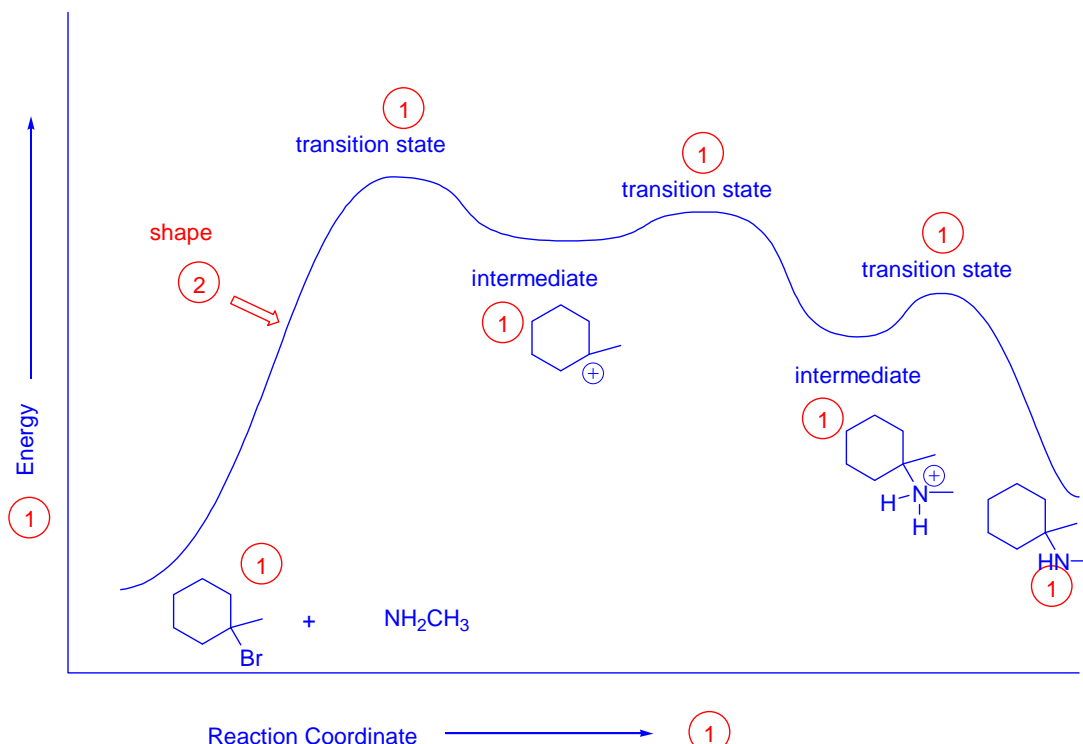
3. Consider the following reaction.



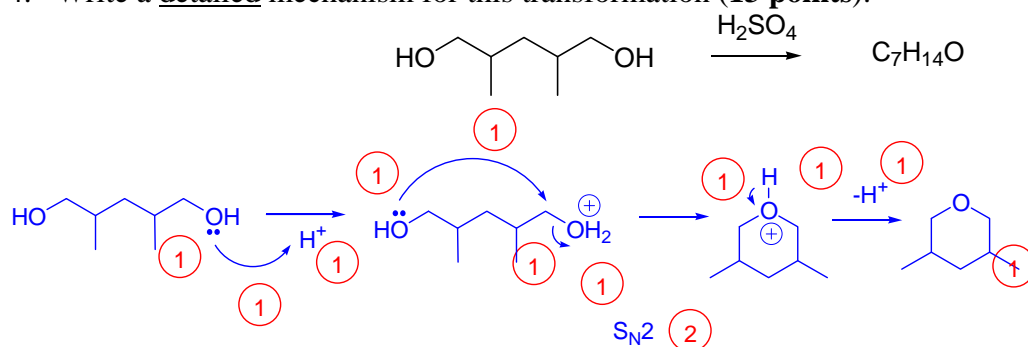
- a. Write a detailed mechanism for this process (8 points)



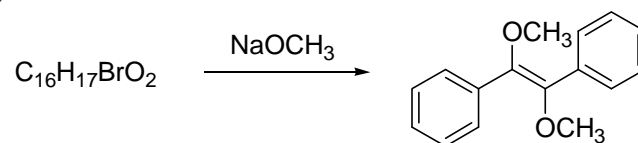
- b. Draw the reaction co-ordinate diagram for the process shown above. Label the starting materials, products, transition state(s) and any intermediates. (11 Points)



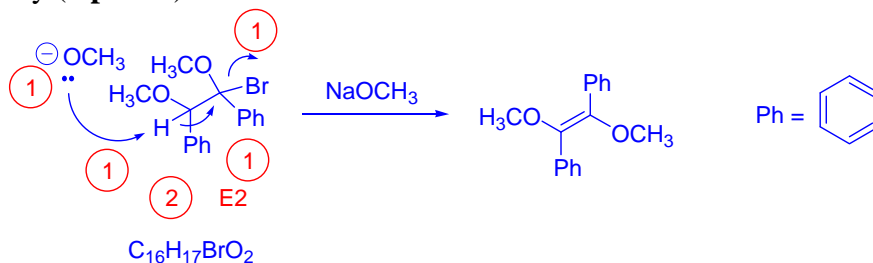
4. Write a detailed mechanism for this transformation (**13 points**).



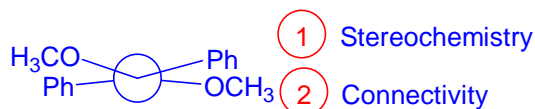
5. Consider the following reaction:



a) Draw the starting material for the process and the mechanism of the reaction, neglecting stereochemistry (**6 points**).



b) Draw the Newman projection of the product conformation (**3 points**).

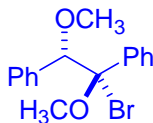


Structure must match structure in part a

- c) Draw the starting material using a Newman projection. (4 points).



- d) Draw the starting material using line notation showing correct relative stereochemistry (2 points)



Structure must match structure in part c

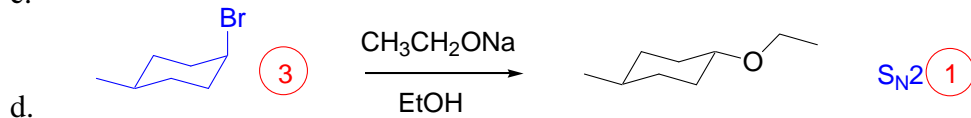
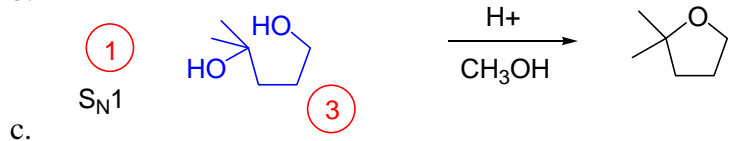
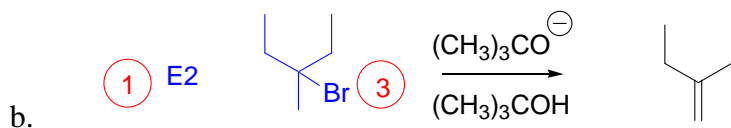
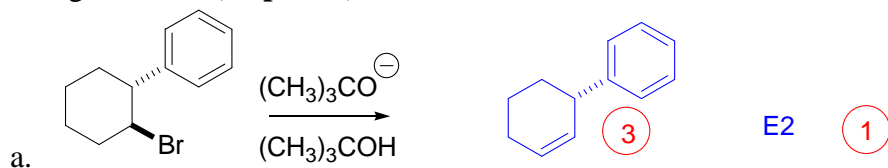
- e) What is the stereochemical relationship between the hydrogen and leaving group in the transition state? (1 point)

Antiperiplanar

- f) What is the configuration of the alkene formed? (1 point)

E

6. Supply the missing products or starting materials as necessary. Indicate what type of reaction is occurring for each. (16 points)



7. Suggest a synthesis of the following compound. You may use any starting material containing two carbons or less. Be sure to include a retrosynthesis. (17 points)

