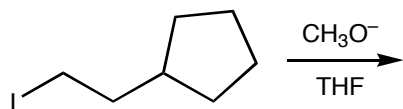


1. _____

1. (a) (2 pts. ea.) Identify whether the following reactions will occur via an S_N1 or an S_N2 mechanism and (b) (5 pts. ea.) predict the products of the following substitution reactions. Remember to consider stereochemistry where appropriate.

2. _____

a.

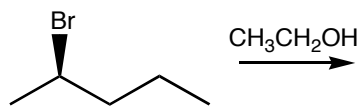


3. _____

4. _____

5. _____

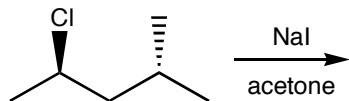
b.



6. _____

7. _____

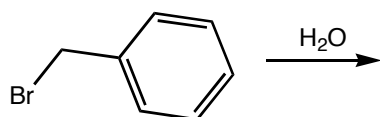
c.



8. _____

9. _____

d.



2. (2 pts. ea.) When dissolved in ethanol, which is the better nucleophile?

3. (2 pts. ea.) When dissolved in THF, which is the better nucleophile?

a. SH⁻ or OH⁻

a. SH⁻ or OH⁻

b. NH₃ or PH₃

b. NH₃ or PH₃

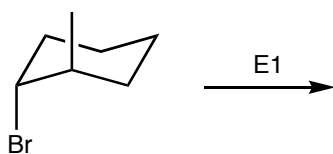
c. SH⁻ or Cl⁻

c. SH⁻ or Cl⁻

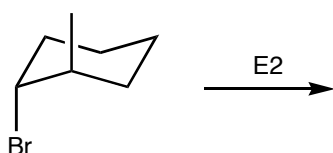
d. H_2O or OH^-

d. H_2O or OH^-

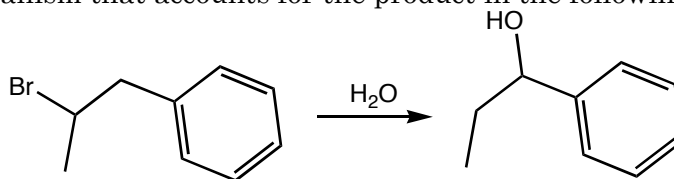
4. a. (6 pts.) Draw the product(s) of an E1 reaction on the following molecule (you do not have to draw chair or boat structures).



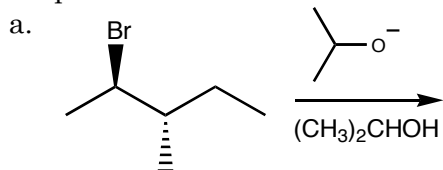
- b. (6 pts.) Draw the product(s) of an E2 reaction on the following molecule (you do not have to draw chair or boat structures).

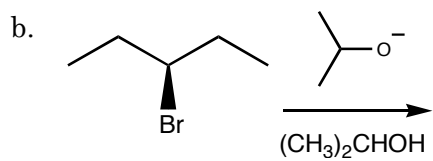


5. (10 pts.) Draw a mechanism that accounts for the product in the following reaction.



6. (6 pts. ea.) Predict the product(s) of each of the following E2 reactions and identify the major product for the reaction in 6b.





7. (a) (2 pts. ea.) Identify the reaction type, and (b) (4 pts. ea.) predict the product(s) in each of the following reactions.

