

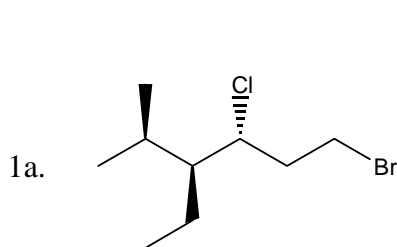
Organic Chemistry - CHEM 231A

Problem Set #2

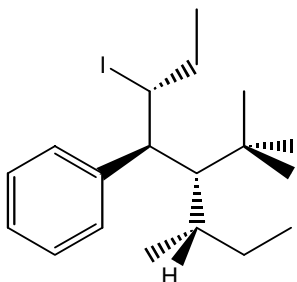
Due Thursday, October 9 at 12:00 pm

40 points total

1. Provide names and/or structures for the following molecules: (10 pts = 2 pts each)



1b.



- 1c. (2R, 3S, 4R) 1-bromo-4-chloro-3-isopropyl-2,4,5-trimethylhexane

- 1d. (2S, 3S, 4S, 5R, 6R) 2-bromo-3-t-butyl-5-ethyl-4-isopropyl-6-trifluoromethyloctane

- 1e. Choose one of the above molecules and draw its enantiomer and at least two non-enantiomeric diastereomers.

2. Consider lithium diisopropyl amide (LDA): (15 pts)

2a. diisopropyl amine has a pKa of 35. What does this mean? Explain how we explain this number in terms of the reactivity of LDA. (2 pts)

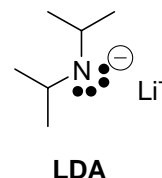
2b. LDA is considered to be non-nucleophilic. Does this contradict the answer to 2a? Explain. Why might it not be nucleophilic (consider the relationship between structure and function of this molecule)? (1 pts)

2c. Consider the reaction of LDA with each of the following molecules. (9 pts = 3 pts each)
For each molecule:

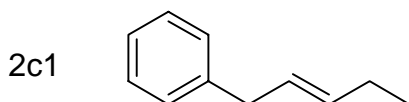
a. Predict the probable product

b. If the molecule acts as an acid, identify the pKa of the acidic part.

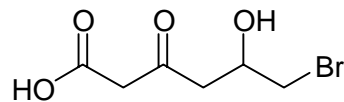
c. If the reaction is an acid/base reaction, predict the direction the equilibrium will lie and provide an overall reaction equilibrium constant.



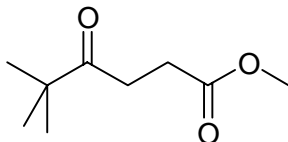
LDA



2c3



2c2



- 2d. Consider the molecule from question 2c3. If two mole equivalents of LDA are used, a second reaction results in the formation of a product with the formula $C_6H_7O_4Li$. What is the structure of this product? Write a mechanism that accounts for the formation of this product. Why would 2 equivalents be needed for this reaction to occur? Explain. (3 pts)

3. Consider the following reactions: (15 pts = 5 pts each)

For each reaction:

1. Identify the nucleophile, electrophile, acid and/or base (more than one may exist).
2. Predict the possible product(s) for the reaction.
3. Explain whether the reaction is likely to occur or not.
4. If the reaction is not likely, explain and suggest how one might change the reactants to facilitate a better reaction.

