

CH0310, ORGANIC CHEMISTRY I

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Quiz 13, Take home, due midnight *Friday*, April 17, 2009

Submit the quiz in pen, or Xerox/fax/scan your pencil copy

Hand in before/after class on Friday

Drop off at 1101 CSC (before 5 pm Friday)

Fax to 412-624-9861 (till midnight Friday)

Email to lynnec@pitt.edu (till midnight Friday, *pdf file only!*)

Multistep Synthesis Problems

To prepare:

- Read Chapter 8, pages 309-317 on synthesis planning and retrosynthetic analysis
- Review your reactions from Chapter 12, 13 and prior chapters
- Do problems 12.37, 38, 55; 13.34, 39, 40

There will be a new kind of problem on the final exam: the multistep synthesis problem. You will be given a starting material and a product and asked to propose a sequence of 2–5 reactions to convert the starting material to the product. You only need to show a correct sequence of reactions for full credit. However, you may want to show the intermediate products of each of your steps so that the grader can see your thinking when considering your answer for partial credit.

When planning a synthesis, you should consider:

- 1) The carbon skeleton of the starting material and the product. Are they different? If so, we only have a few ways so far to make (Grignard, nitrile/alkyne alkylation) or break (ozonolysis, KMnO_4 cleavage) C–C bonds. Which one(s) will you use?
- 2) Functional group pattern and oxidation state. How will you need to adjust the precursor to make the product?
- 3) Stereochemistry. Is stereocontrol needed or not? How will you do it?

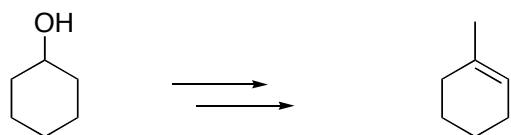
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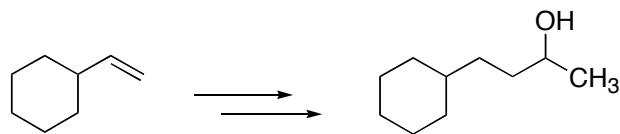
Multistep Synthesis Problems

Provide reasonable reaction sequences for the following transformations. More than one step will be required. You can use any needed organic or inorganic reagents. Count the carbons carefully!

1)



2)



3)

