

# Chemistry 547 (Reich)

Second Hour Exam

Nov. 21, 2013

1 \_\_\_\_/24

2 \_\_\_\_/28

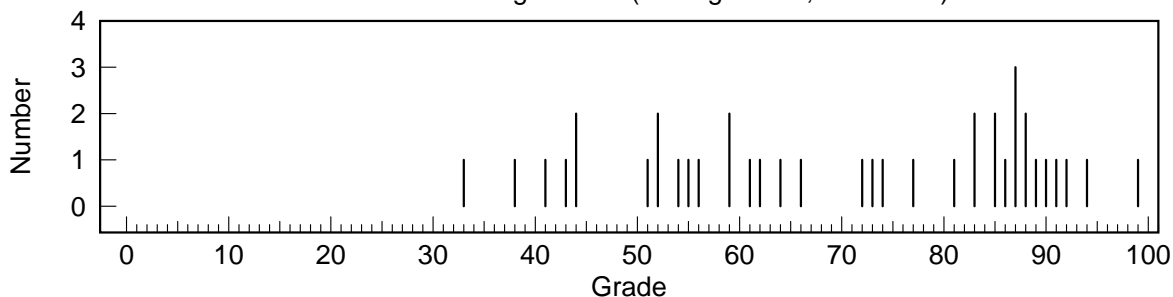
3 \_\_\_\_/24

4 \_\_\_\_/24

Total \_\_\_\_/100

High 99  
Median 72  
Average 70  
AB 80  
BC 55  
CD 45

Distribution from grade list (average: 69.9; count: 39)



## Grading Copy

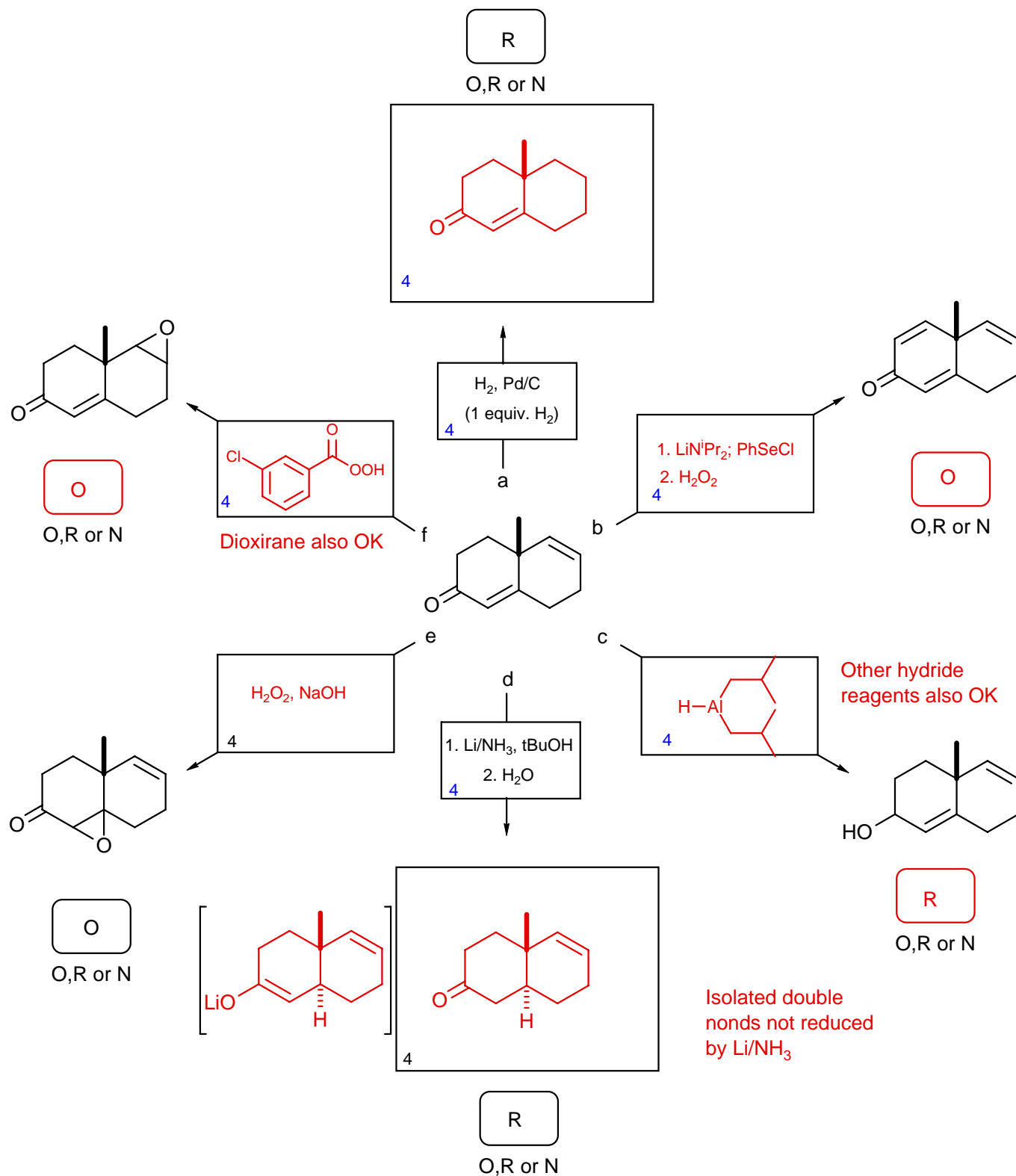
Name \_\_\_\_\_

If you place answers anywhere else except in the spaces provided,  
clearly indicate this on the answer sheets.

NOTE: Do not use acronyms for reagents or solvents, unless you define them first.

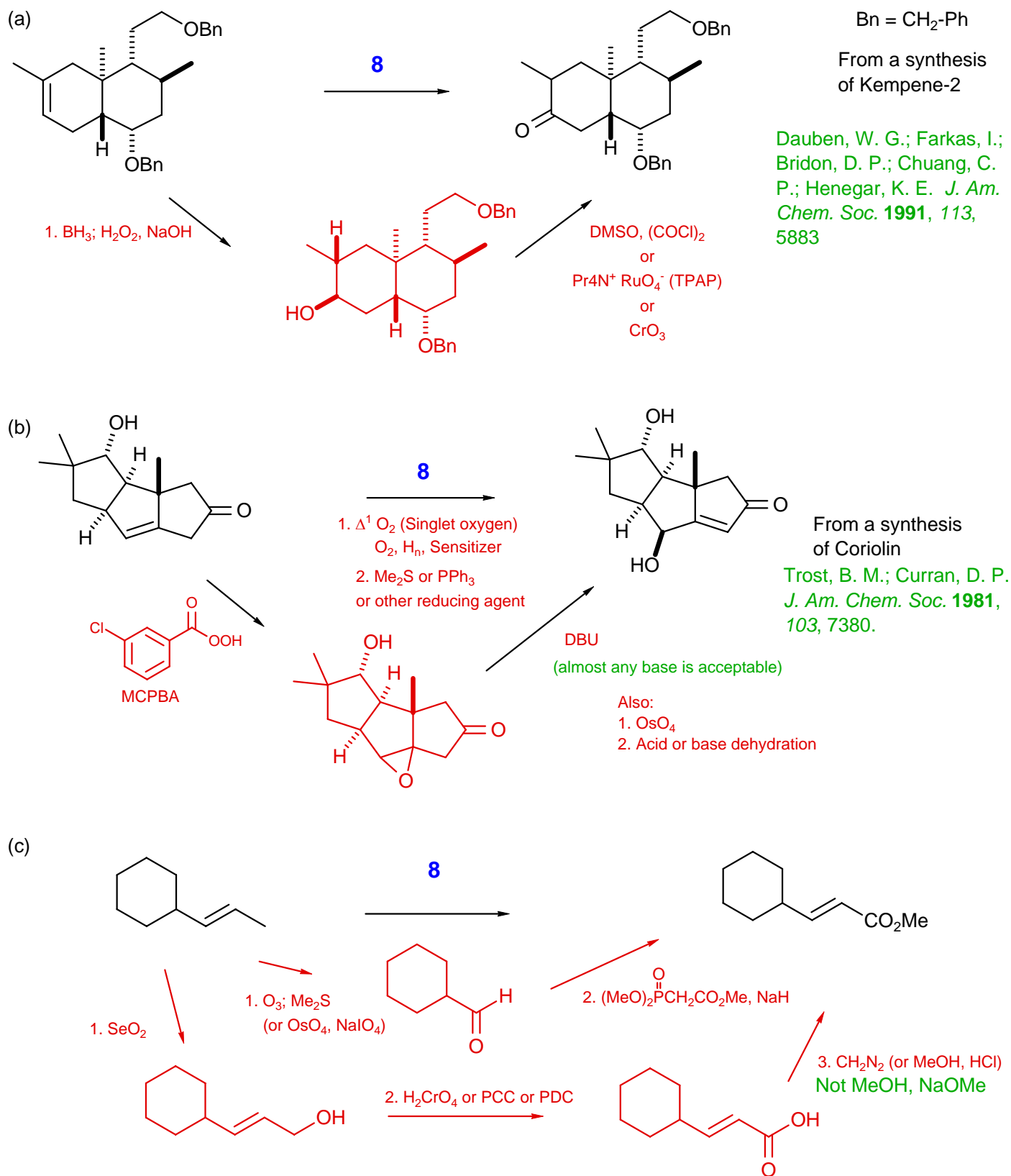
For the synthetic transformations which involve more than one step, you should show the product of the reaction after each step, but you do not need to write mechanisms.

1. Show how the synthetic transformations below can be performed. In the boxes provided give the reagents needed, or the expected product, and indicate whether the reaction is an oxidation [O], reduction [R] or neither [N]

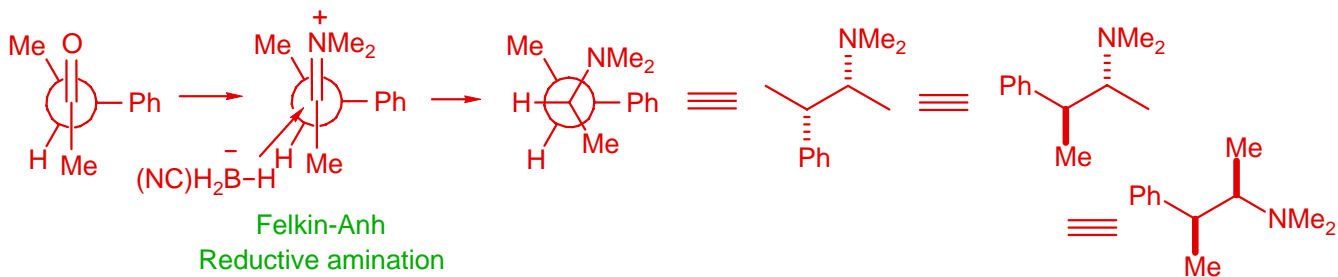
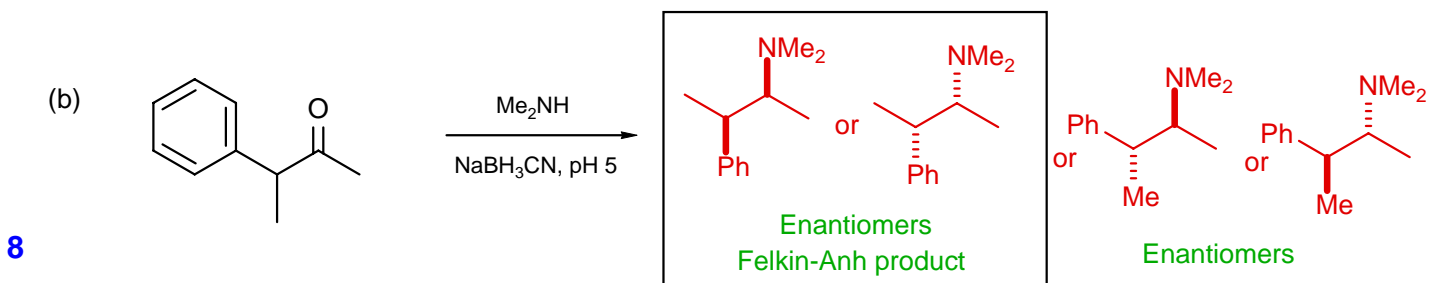




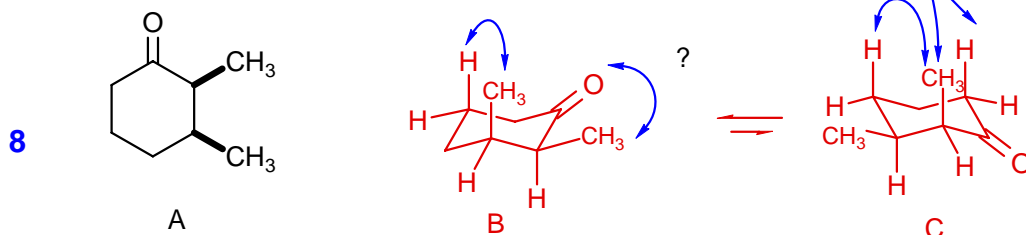
3. (24) These examples were taken from natural product syntheses. Provide suitable reagents. More than one step may be needed. Make sure you consider stereochemistry. Do not do more than two steps without showing intermediate structures.



4 (a) (8) Predict the major product of the reaction below. **Show stereochemistry** and provide a rationale for the stereochemical result. You do not need to write a complete mechanisms.



(b) (8) Draw good representations of the two chair forms of A. Indicate which will be more stable, and by approximately how much (kcal/mol).



B will be more stable than C because in B there is only one axial H-CH<sub>3</sub> interaction, whereas in C there are two. Since each costs about 0.9 kcal/mol ( $A_{\text{CH}_3} = 1.8$ ), B should be more stable than C by about 0.9 kcal/mole

(c) (8) Predict the product of the following reaction. Show stereochemistry, and draw a stable conformation of the product.

