Exam 2
Organic Chemistry C3444
Prof. Nuckolls
March 14, 2002

- **Write your name on every page.**
- **You should have 6 pages including this one.**
- **Turn off your cellular phones.**
- **Do your own work.**
- **Good Luck!**

Name: _____

Columbia I.D. #: _____

Signature: _____

Grading:

#1	/11
#2	/11
#3	/11
#4	/11
#5	/11
#6	/11

Section 1 _____ /66 points

Section 2 _____ /17 points

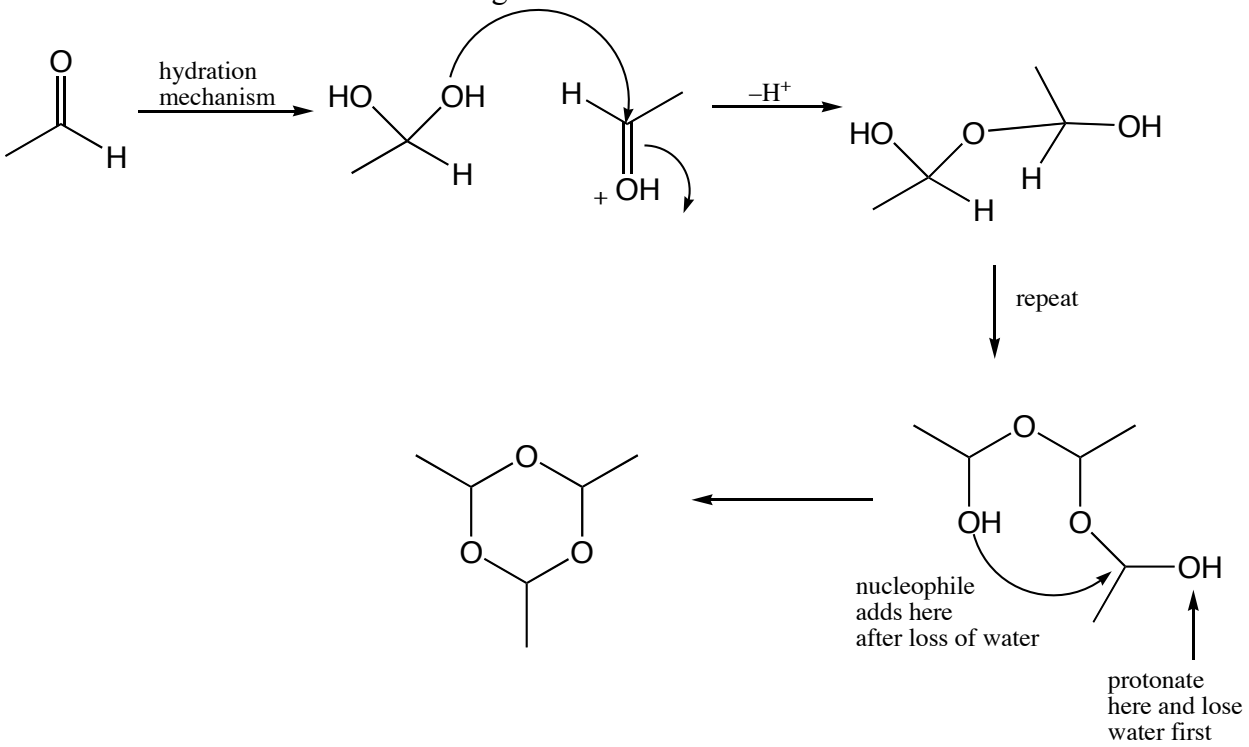
Section 3 _____ /17 points

_____

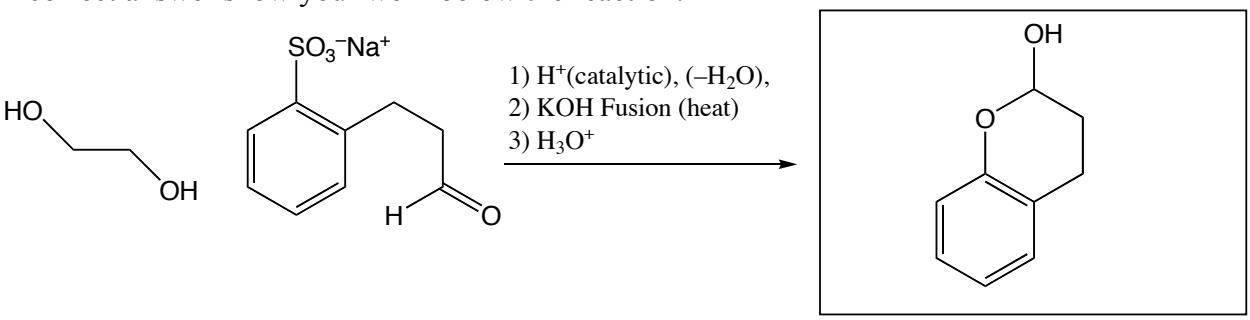
Total _____ /100 points

Section 1. Short answer (11 points each)

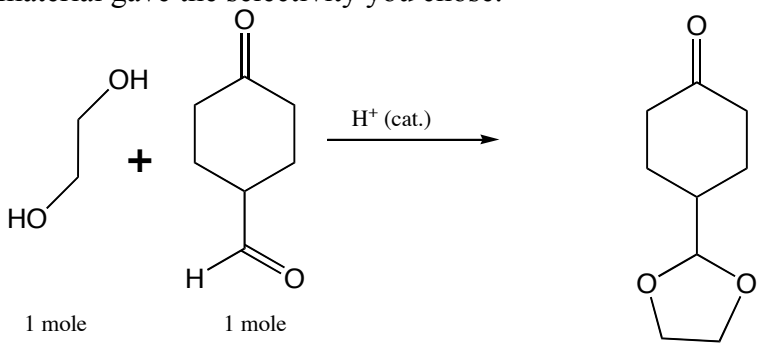
1. Write a mechanism for the following reaction.



2. Draw the product from the following reaction in the box. To achieve partial credit for an incorrect answer show your work below the reaction.

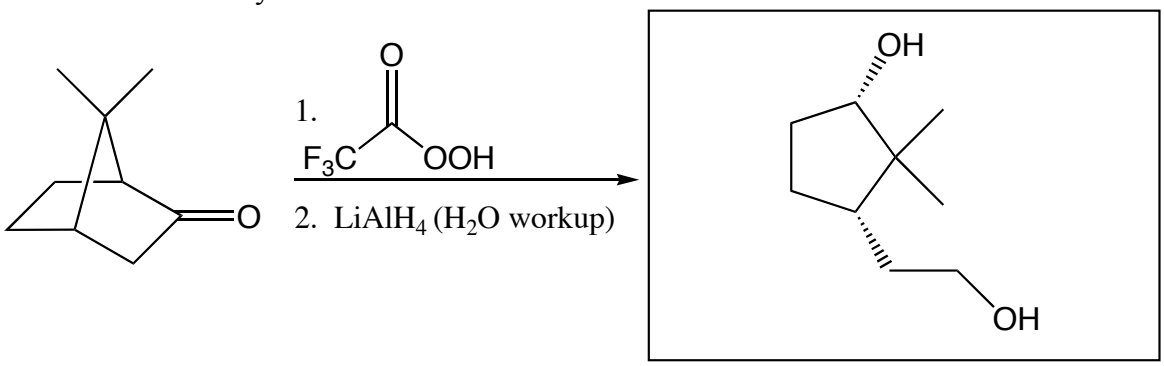


3. (1) Write the mechanism for the following reaction. (2) Briefly describe how the electronics of the starting material gave the selectivity you chose.

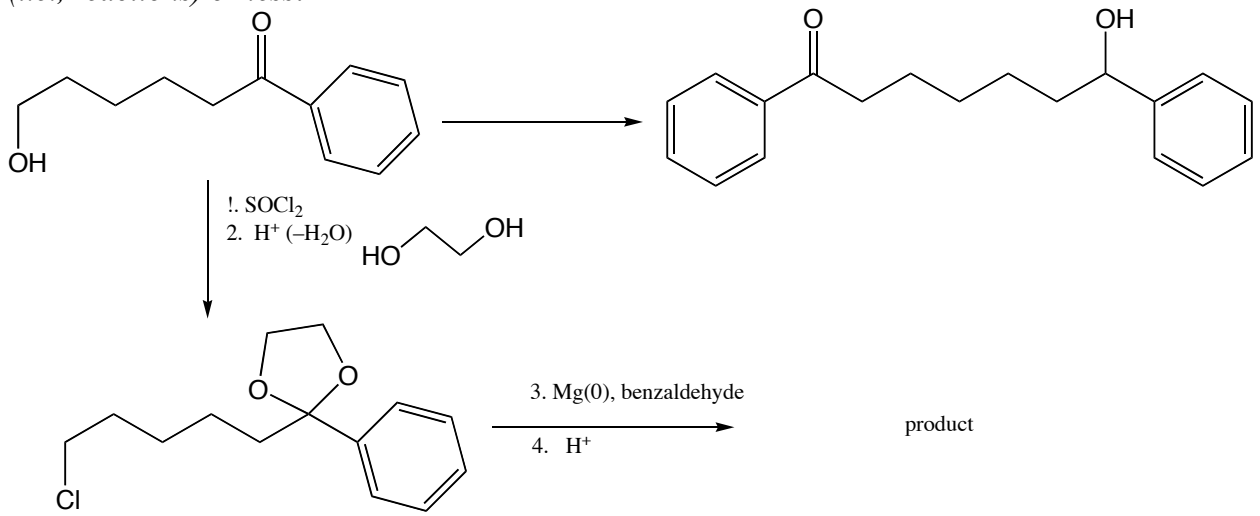


The carbonyl of the aldehyde is less stable than the carbonyl of the ketone. Draw the charge separated resonance forms: secondary vs. tertiary cation.

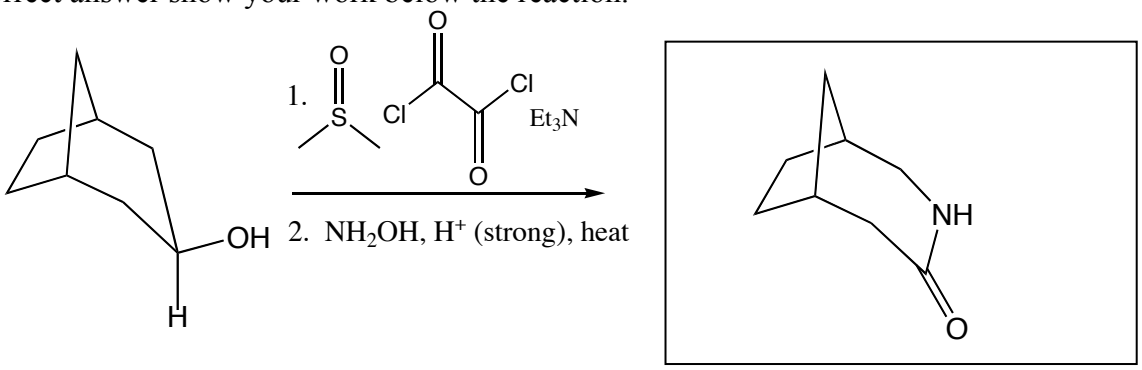
4 Draw the product from the following reaction in the box. To achieve partial credit for an incorrect answer show your work below the reaction.



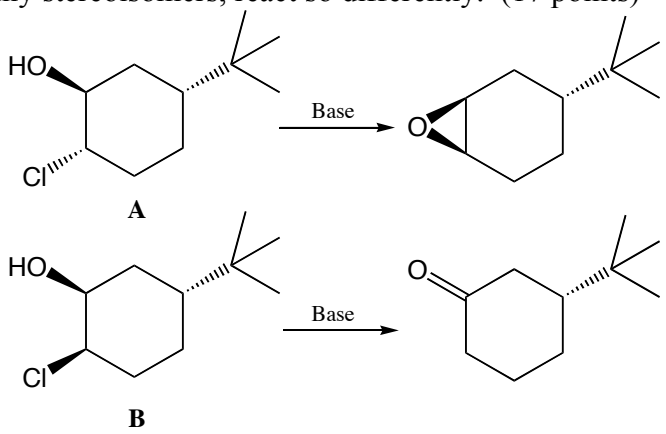
5. Show the synthetic steps to convert starting material to product in the equation below. You can use any organic or inorganic reagents or fragments you need but use only a total of *5 steps (i.e., reactions) or less*.



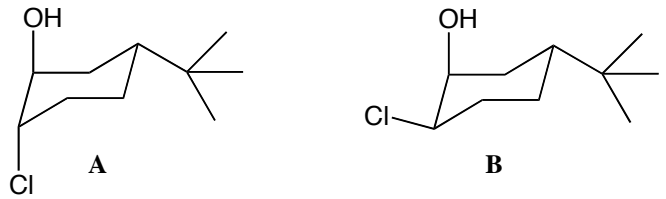
6. Draw the product from the following reaction in the box. To achieve partial credit for an incorrect answer show your work below the reaction.



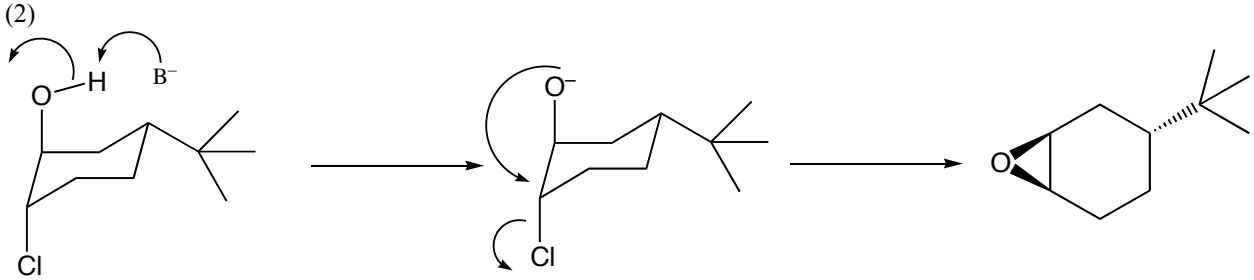
Section 2. (1) Draw a three both **A** and **B** in their chair forms *assume that the t-butyl group is in the equatorial position.* (2) Write out the complete mechanism showing the electron flow for each of these compounds to be converted to the product. (3) Explain *briefly* why the two compounds, that are only stereoisomers, react so differently. (17 points)



(1)



(2)



There was an error in the second equation. That mechanism was not graded.

(3) The nucleophile and electrophile need to be in a line for Sn2 attack. As in A above.

Section 3. Show the synthetic steps to convert starting material to product below. Using pieces that have no more than 2 contiguous carbons show the steps to convert the starting material to the product. Use *no more* than 7 steps total. (17 points)