EXAMINATION 2

Chemistry 3A
Professor K. Peter C. Vollhardt
November 7, 1995

Name: _____
(PRINT First name first, then Last name. Use capital letters!)

Please check the name of your TA and corresponding section number. Complete the remaining information if applicable.

111	Tewell,Craig	_____	331	Bruchez,Marcel	_____
121	Caylor,Chris	_____	341	Werkema,Evan	_____
131	Nitschke,Jonathan	_____	351	Sweeney,Zachary	_____
141	deForest,Sarah	_____	361	Chan,Eugene	_____
151	Wanandi,Paulus	_____	411	Barchas,Eric	_____
161	Laszlo,Chloe	_____	421	Gray,Nathanael	_____
211	Robblee,John	_____	431	Gobran,Hala	_____
221	Staunton,Joanna	_____	441	Dysard,Jeff	_____
231	Cave,John	_____	511	Furlanetto,Michael	_____
311	Fulton,Robin	_____	521	Andryski,Scott	_____
321	Golden,Jeff	_____	531	Bise,Ryan	_____
	Making-up an I grade	_____	541	Kotz,Kenneth	_____

(If you are, please indicate which semester you previously took Chem 3A _____ .)

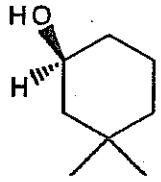
Please write the answer you want graded in the space provided. Do scratch work on the back of the pages. This test should have 12 numbered pages. Check to make sure that you have received a complete exam. A good piece of advice: **read carefully over the questions at least twice; make sure that you understand exactly what is being asked; avoid sloppy structures or phrases. It is better to be pedantic in accuracy! Good Luck!**

DO NOT WRITE IN THIS SPACE

		I.	_____	(30)		
IVa.	_____	II.	_____	(60)		
IVb.	_____	III.	_____	(25)	Va.	_____
IVc.	_____	IV.	_____	(45)	Vb.	_____
Subtotal	_____	V.	_____	(40)	Subtotal	_____
		Total	_____	(200)		

I. **[30 Points]**
Name or draw, as appropriate, the following molecules according to the IUPAC rules. Indicate stereochemistry where necessary (*cis, trans, R,S, or meso*).

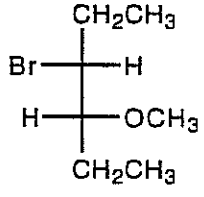
a.



b.

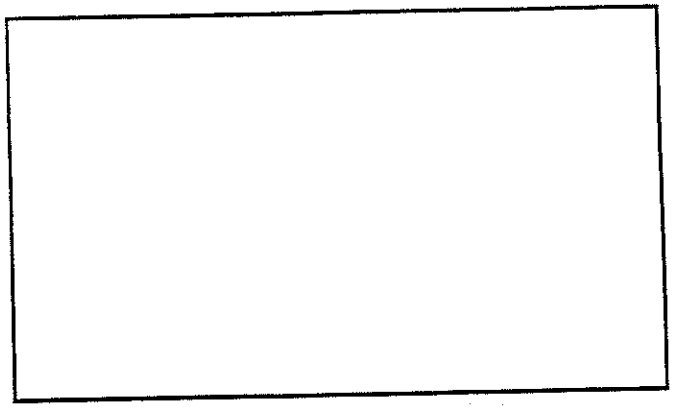
(1S,2R) – 2 – Methylcyclopentanol

c.

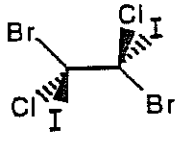


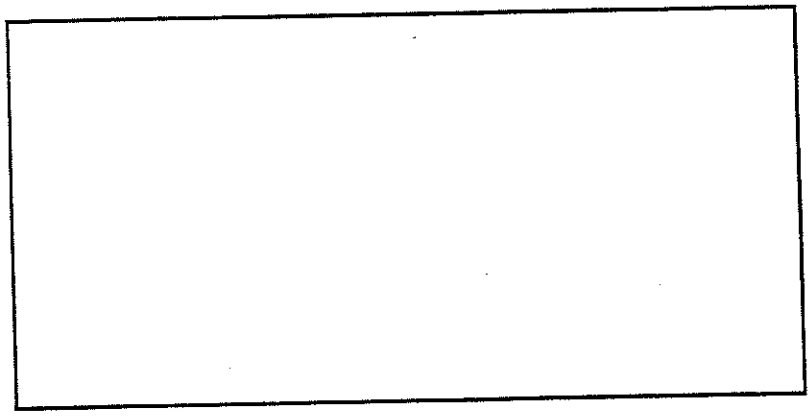
d.

(6R) – 6 – [(1R) – 1 – Methoxyethyl]
–6 – (2 – methoxyethyl) – 1 – undecanol



e.

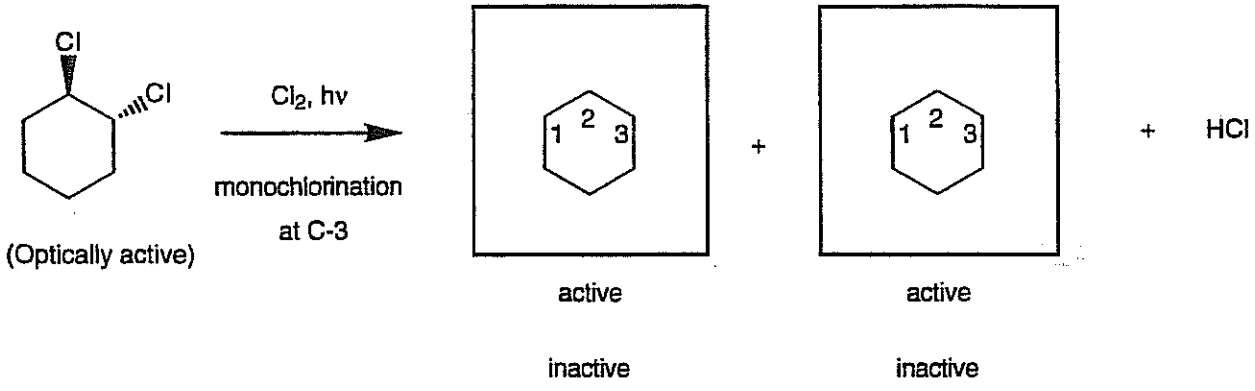




II. **[60 Points]**

Add the missing starting materials, reagents, or products (aqueous work-up is assumed where necessary). Don't forget stereochemistry!

a. Use the stencils in the boxes. Circle the correct answer below the boxes.



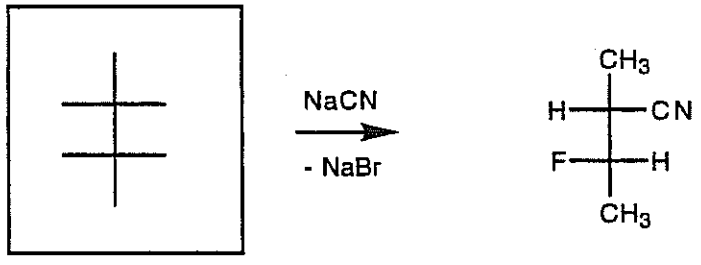
active

inactive

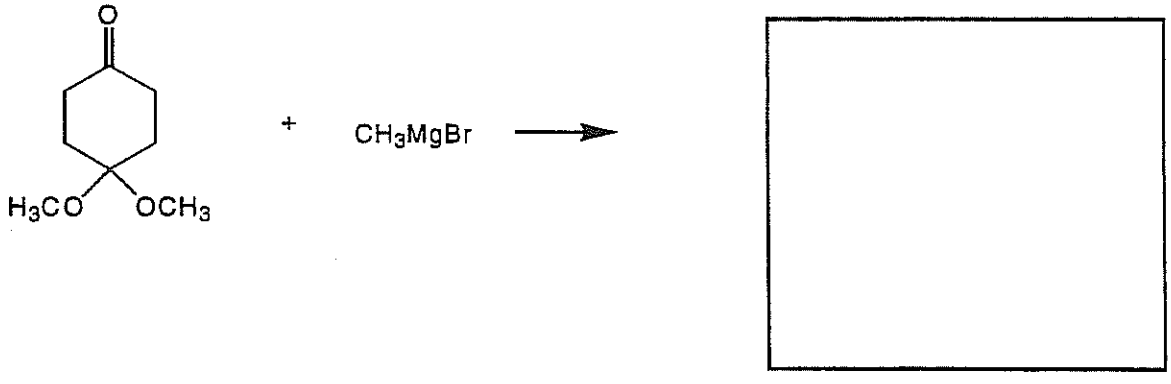
active

inactive

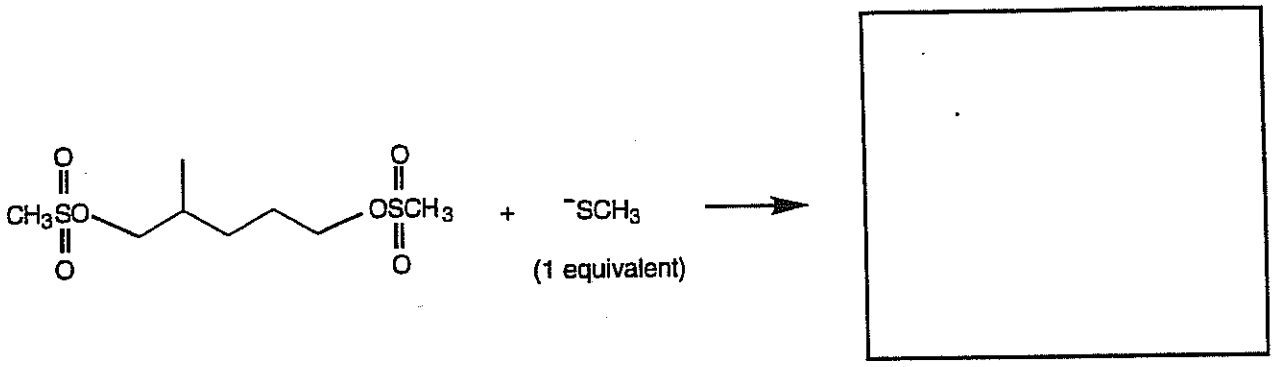
b.



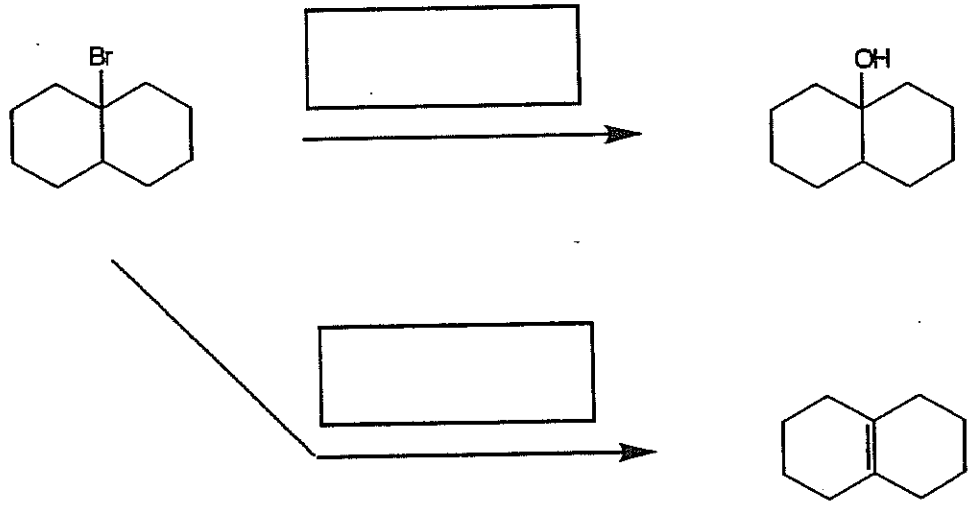
c.



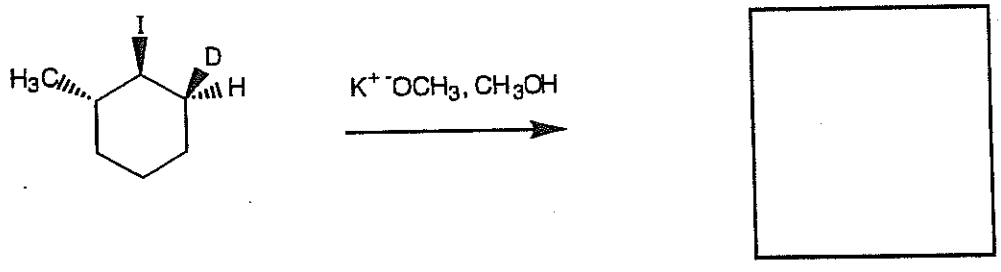
d.



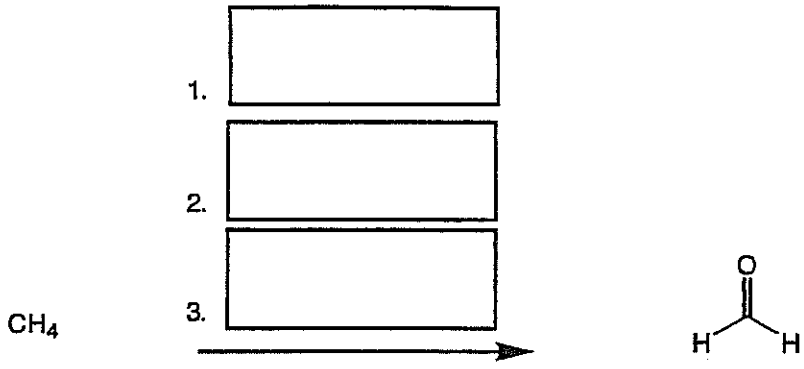
e.



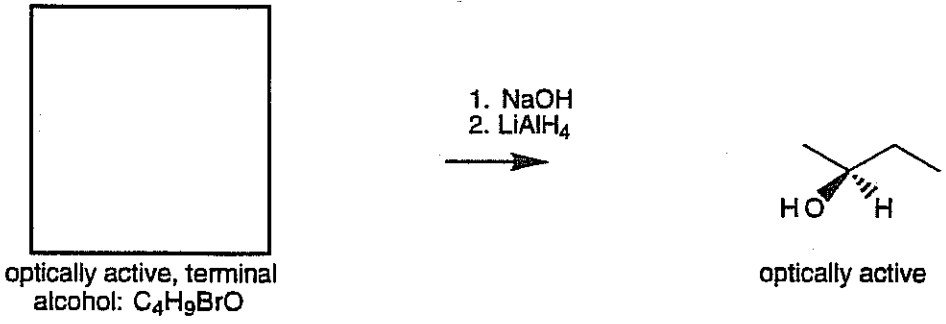
f.



g.



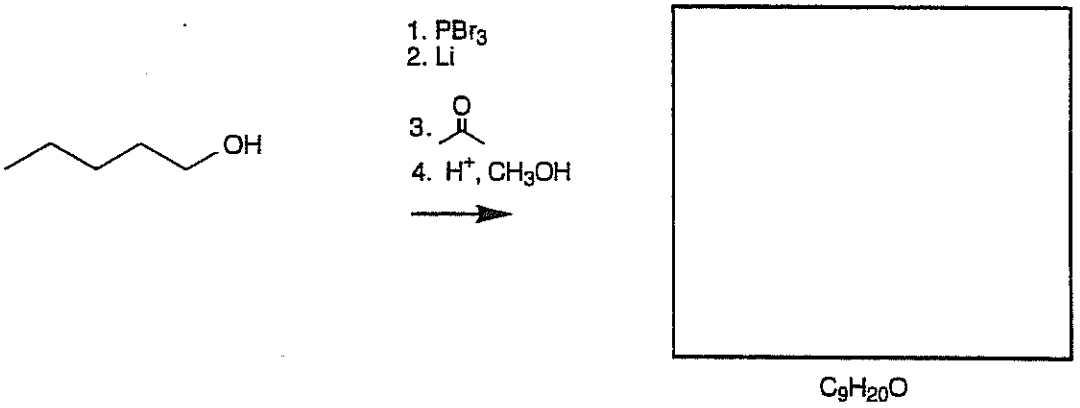
h.



optically active, terminal alcohol: C_4H_9BrO

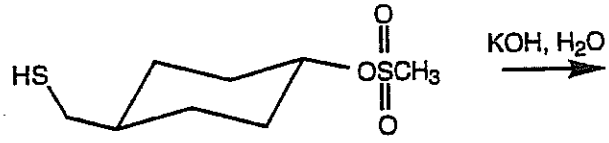
optically active

i.



$C_9H_{20}O$

j.

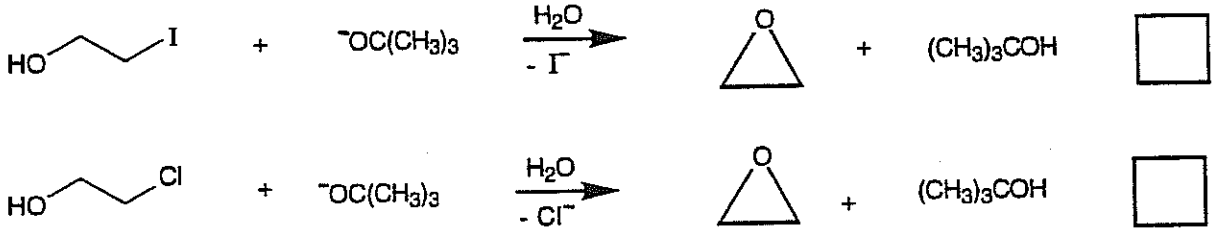


$C_7H_{12}S$

III. **[25 Points]**

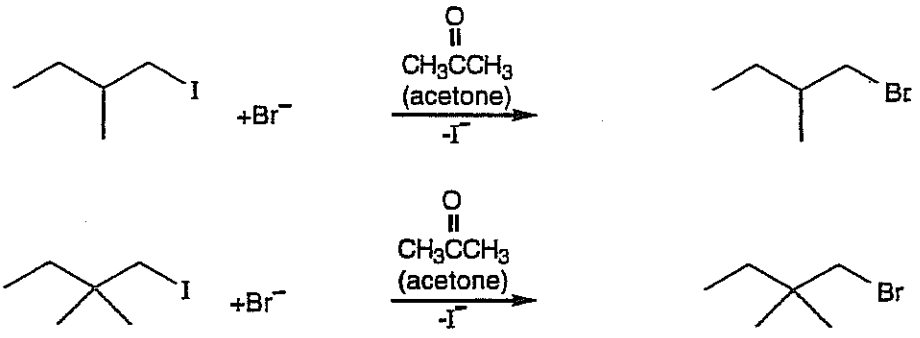
For each pair of reactions shown below, 'X' the box on the right, indicating which will go faster, and circle the mechanism by which it proceeds (e.g., SN_2, SN_1, E_2, E_1). In one complete, grammatically correct sentence, provide a brief explanation in each case in the bottom box provided (i.e., explain why so-and-so is a better nucleophile, leaving group, solvent, etc.). *No credit will be given for the right answer with an incorrect reason.* Note: the compound on top of the arrow is the solvent.

a.



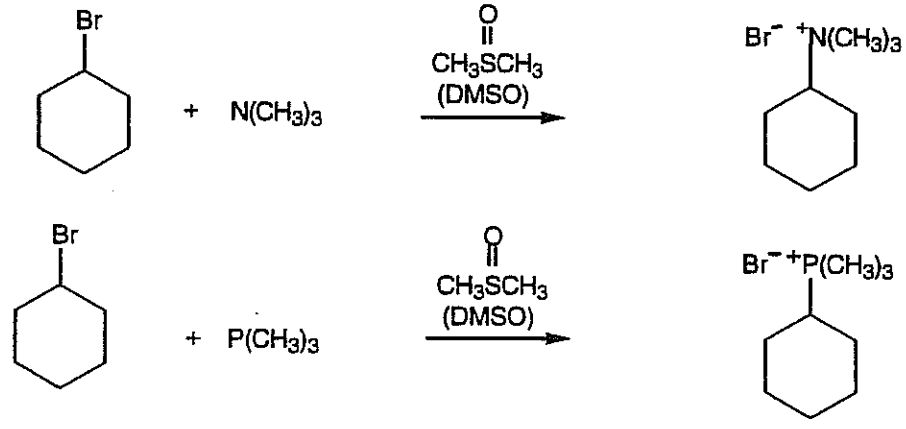
SN_2 SN_1 E_2 E_1

b.



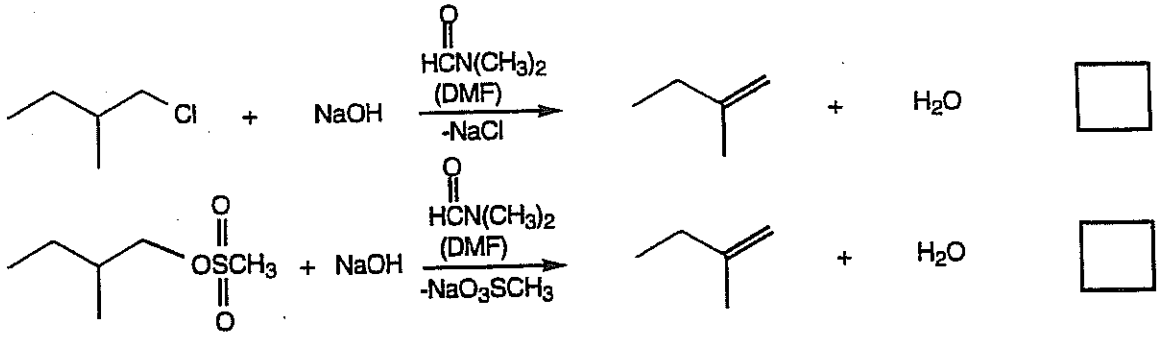
SN2 **SN1** **E2** **E1**

c.



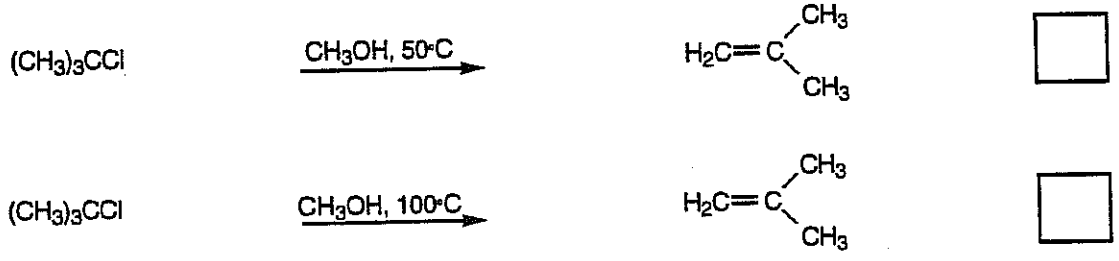
SN2 **SN1** **E2** **E1**

d.



SN2 **SN1** **E2** **E1**

e.

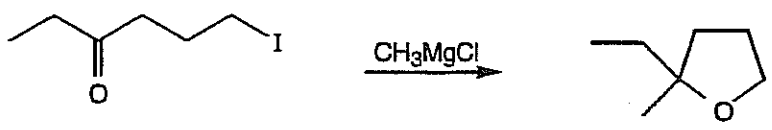


SN2 **SN1** **E2** **E1**

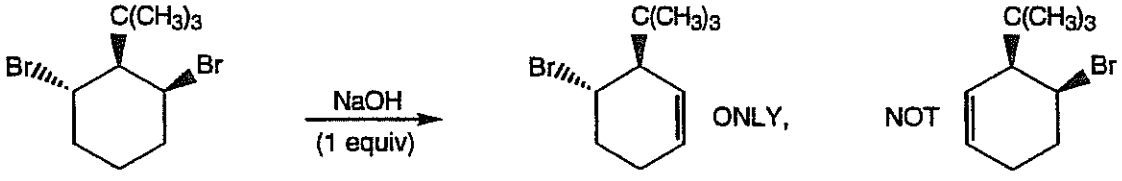
IV. [45 Points]

Explain the following observations by a detailed mechanism (i.e., write a scheme with structures, use arrow-pushing, etc.)

a.

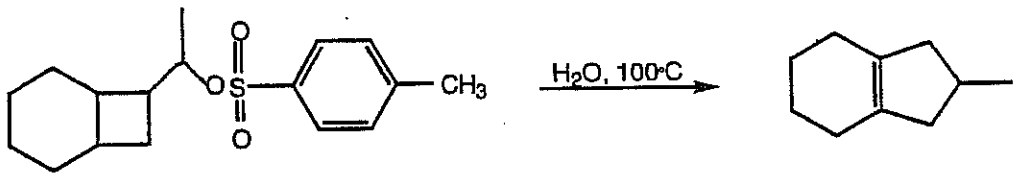


b.



Hint: use the chair conformational picture of the starting material.

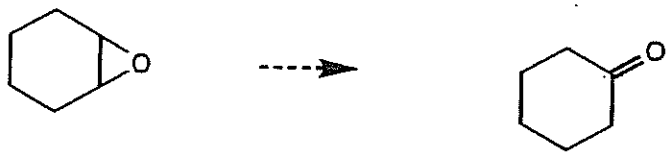
c.



V. **[40 Points]**
Provide a viable synthetic route from starting material to product. You may use any additional organic and inorganic compounds in your scheme.

a.

b.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BIZARRO Piraro
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