Exam 2

Chemistry 333

Organic Chemistry I

Thursday April 2, 2009

Name: KEY .

The exam is worth a total of 100 points; there are six questions. Please show all work to receive full credit for an answer.

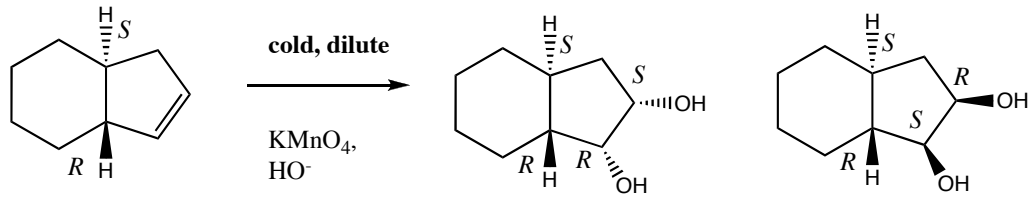
By putting your name on this exam, you agree to abide by California State University, Northridge policies of academic honesty and integrity

Molecular models are allowed for this exam. Calculators are not needed.

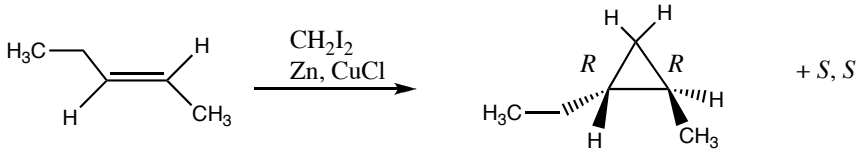
Good Luck!

1. Draw the structure of the products of the following reactions, ***noting R or S configurations for asymmetric carbon atoms***. If a racemic mixture is formed, indicate why. (5 pts each)

(a)

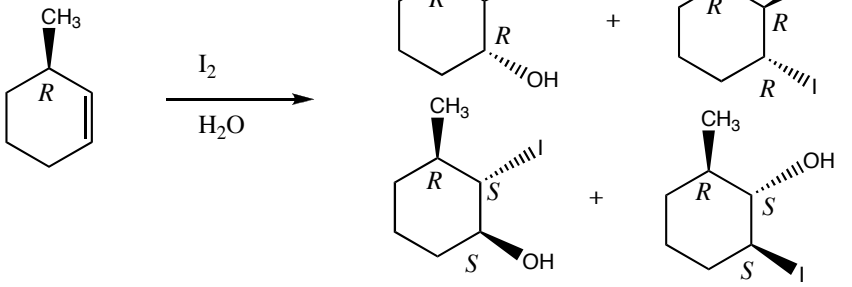


(b)

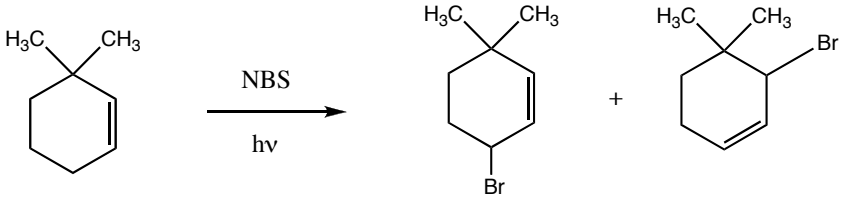


+ *S*, *S*

(c)

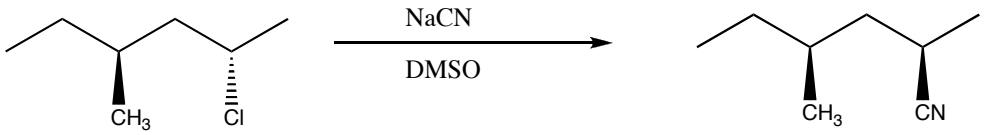


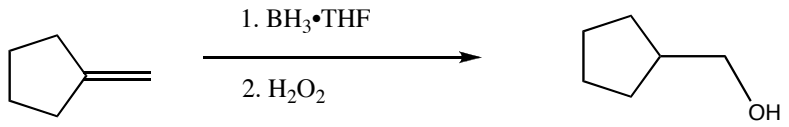
(d)

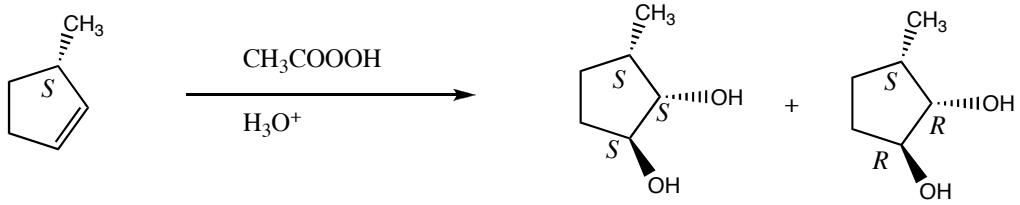


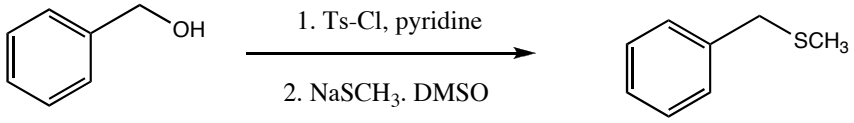
racemic (R+S) racemic (R+S)

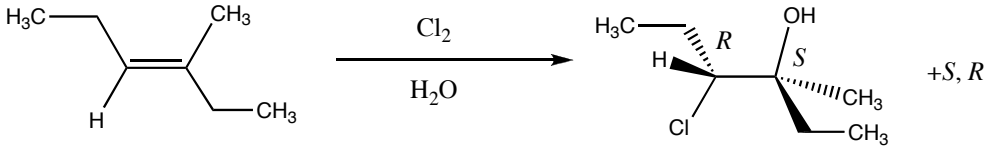
2. Indicate a reagent or ***sequence*** of synthetic steps to accomplish the following transformations. **More than one step may be required!!!!** (4 pts each)

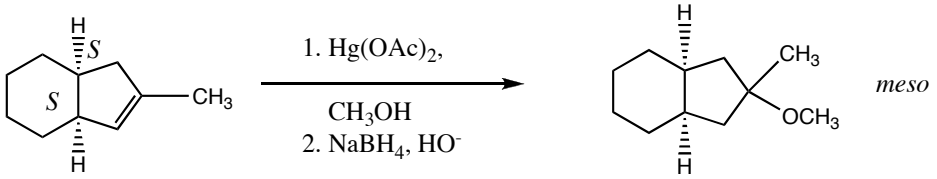
a. 

b. 

c. 

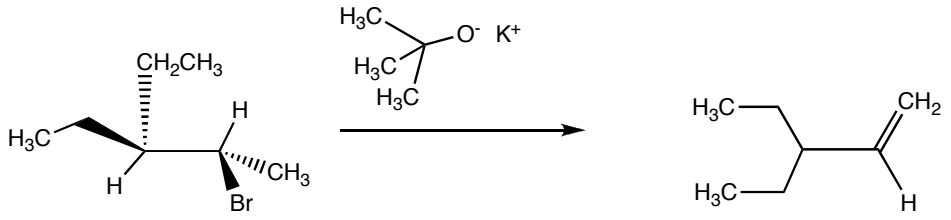
d. 

e. 

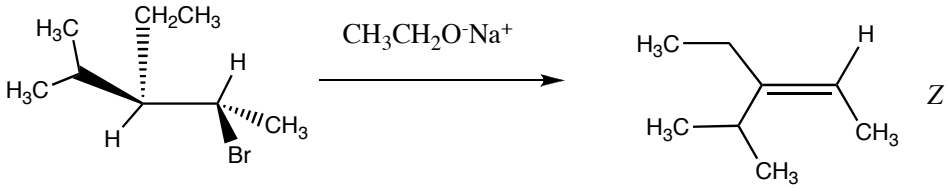
f. 

3. Draw the structure of the **major** **alkene** product of the following reaction, ***indicating E, Z configurations where appropriate (4 points each)***

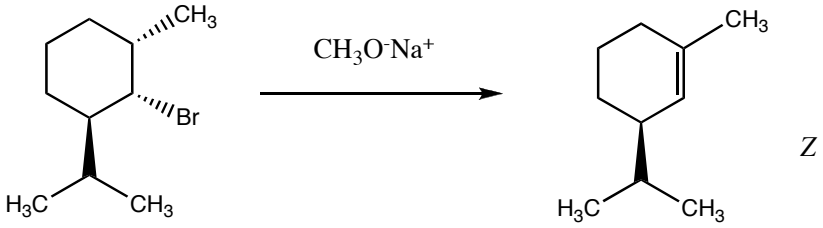
(a)



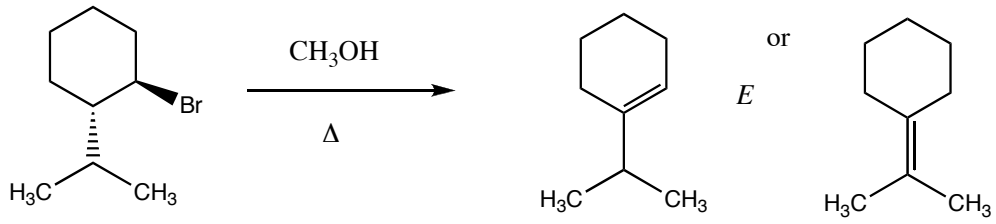
(b)



(c)

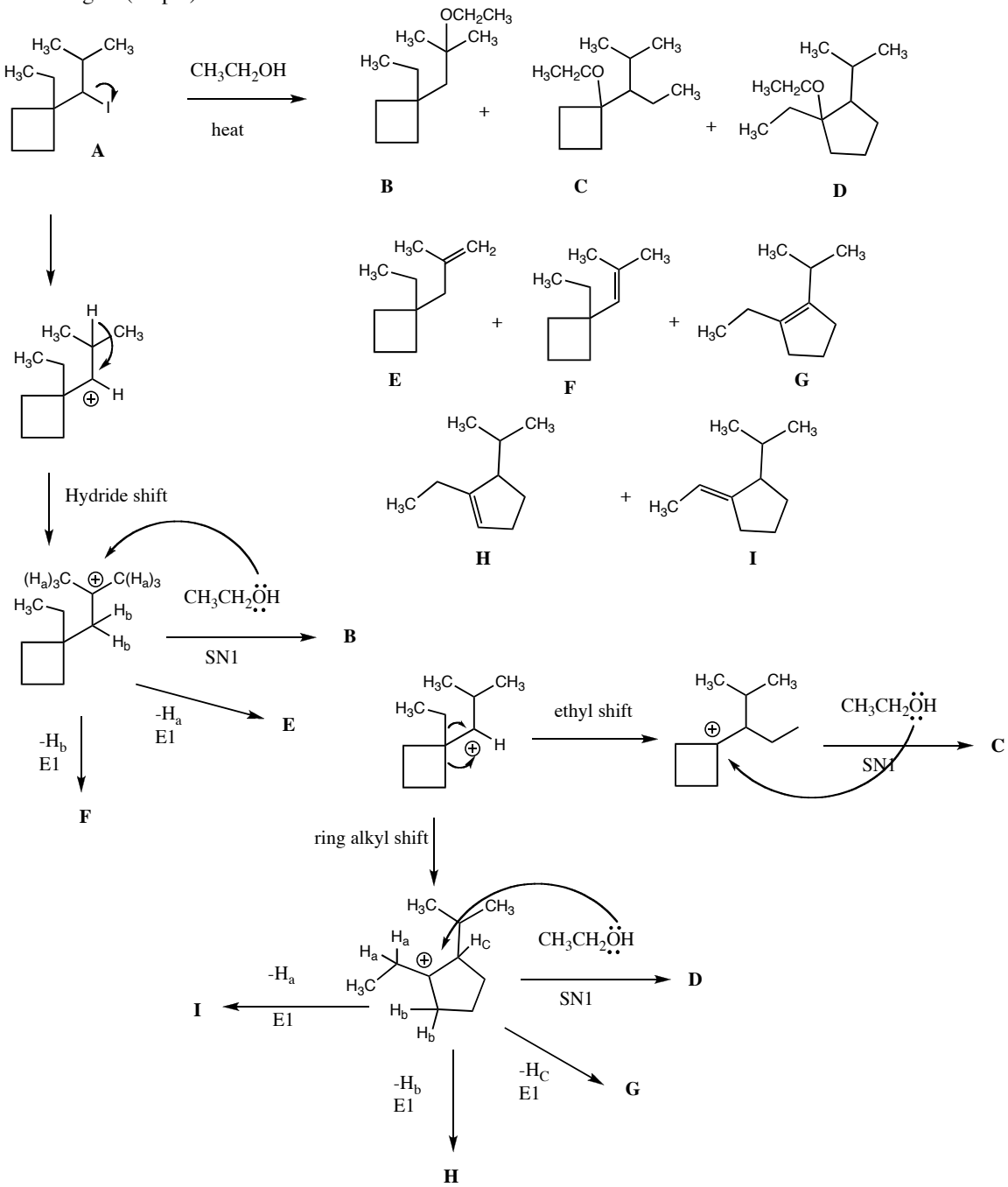


(d)

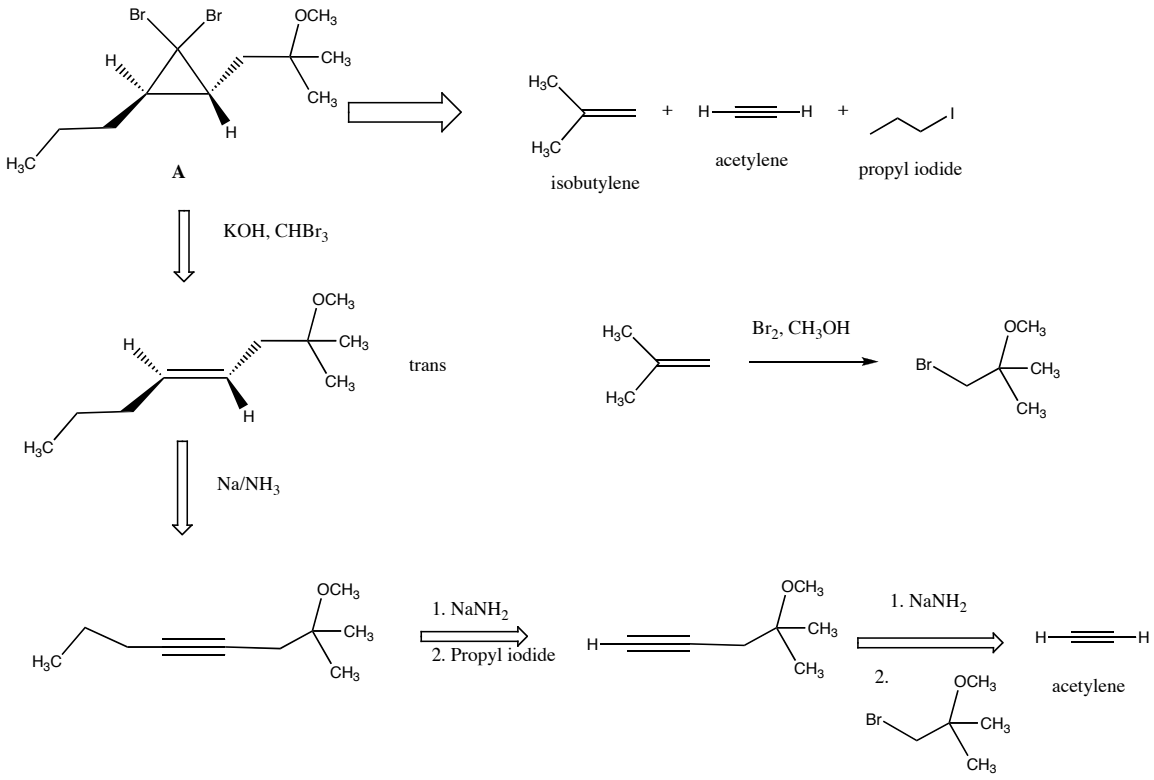


USE SCRATCH PAPER ON BACK PAGES OF EXAM IF NECESSARY

4. Heating iodide **A** with ethanol leads to the formation of multiple products. Draw a **mechanism** to account for the formation of **TWO** substitution products and **TWO** elimination products shown below using the curved arrow notation. Be sure to include all relevant intermediates and formal charges. (20 pts)

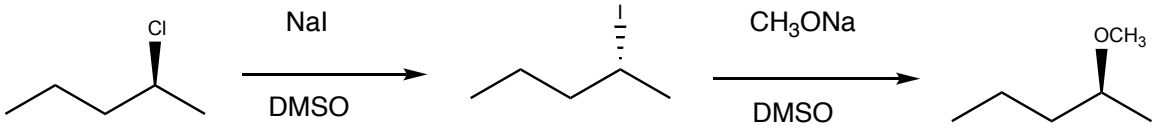


5. Devise a synthetic sequence to prepare compound **A** from acetylene, isobutylene, and propyl iodide. Useful reagents for your synthesis include: KOH, Na/NH_3, $NaNH_2$, Br_2, $CHBr_3$. (20 points)

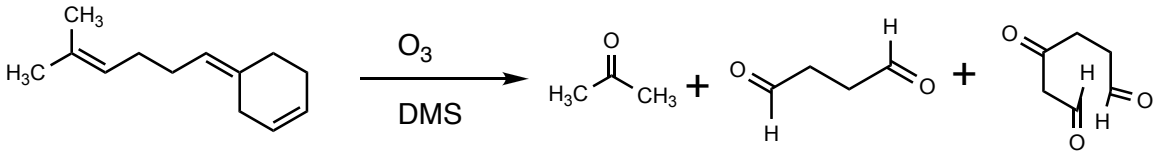


Bonus.

a. (5 points) SN2 reactions proceed with inversion of stereochemistry. Show how you could use **two** SN2 successive reactions to achieve the following transformation:



b. Ozonolysis of triene **A** produces the 1 mole each of **B**, **C**, and **D**. Draw the structure of triene A. (5 points)



A **B** **C** **D**

Congratulations!

Score

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Bonus: _____/10

Total:_____/100