EXAM 2

CHEMISTRY 225b

Friday, March 28, 2008

NAME (print): _____

TA:_____ Day:_____ Time:_____

Take a few moments to look over the exam. Answer each question on the exam paper.

Important clues, points, and structures are in **bold**.

Do all **preliminary** drawing or computations on the work sheets at the end of the exam. The work sheets will not be graded

The exam is 55 minutes.

STOP writing and hand in your exam when you are asked to do so.

REMEMBER: Neatness is to your advantage.

1. (30 pts) Reactions (5 of 6) _____

2. (30 pts) Potpourri _____

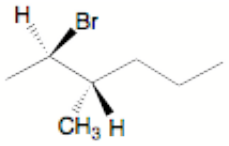
3. (20 pts) Structure _____

4. (20 pts) Mechanisms (1 of 2) _____

_____

Total (100 pts)

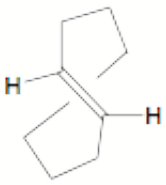
(30 pts.) **Reactions:** Provide the required information in **5 of 6** of the following reactions. **Pay attention** to stereochemistry, optical activity, etc. **If you do six problems, cross out the one that you do not want graded.**

a) 

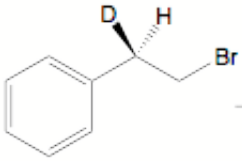
$(CH_3)_3COK$

$(CH_3)_3COH$

A (major: opt. inact.)
and **B** (minor; opt. act.)

b) 

reagents?

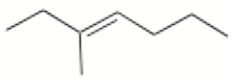
c) 

opt. act.

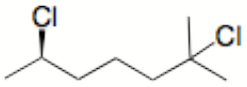
E_2

A (major) + **B** (minor)

2. Continued…

d)  1) B_2H_6 → 2) aq. NaOH **A**

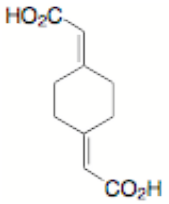
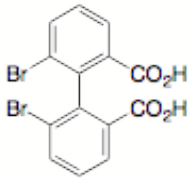
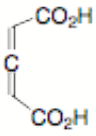
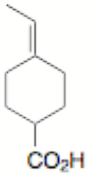
e) (*R*)-$CH_3CH_2CH_2CH_2CH_2CHDCl$ $\xrightarrow[\text{aq. KOH}]{C_2H_5SH}$ **A**

f)  opt. act. excess methanol → room temperature **A** (opt.act.)

2. (30 pts.) **Potpourri:** Complete **each** of the following problems.

a) (*R, R*)-Tartaric acid has [a] = +12°. What is the specific rotation of a 2:1 mixture by weight of meso-tartaric acid and (*S, S*)-tartaric acid, respectively? **Show work**.

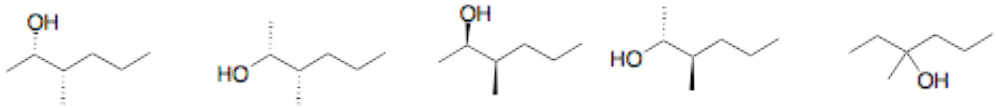
b) **Circle** the compounds that are capable of resolution.





(*E*)-Cyclooctene

c) **Circle** the terms that apply to E_2 eliminations.

concerted	deuterium isotope effect	rate=k[RX]
orbital overlap	rate=k[RX][Nuc]	

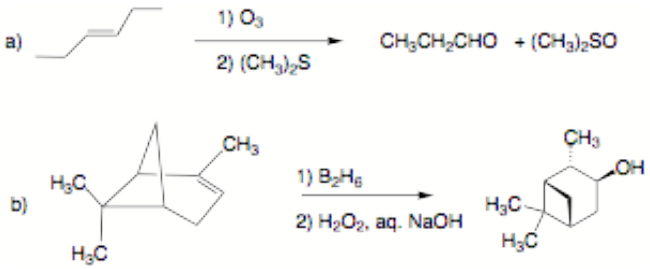
d) **Circle** the alcohol(s) that represent the racemates formed by the hydroboration of (*E*)-3-methyl-2-hexene.



e) The normal chain hexene that gives a **single** product upon ozonolysis and is more stable by ~1 kcal/mol than its geometrical stereoisomer.

3. (20 pts.) **Structure:** Compound **A**, C_8H_{16}, forms a meso compound **B** upon reaction with bromine in CCl_4 and forms d,l-diol **C** upon oxidation with OsO_4/H_2O_2. Ozonolysis of **A** forms a **single** ketone **D**. What are the structures of **A-D**? Show your reasoning.

4. (20 pts.) **Mechanisms:** Provide a detailed mechanism for **one, and only one**, of the reactions shown below. Use the curved arrow formalism. **Pay attention** to stereochemistry, and the absence of stereo- and regioisomers as these issues may apply.



Work Sheets
Work Sheets
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