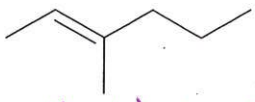
Name Key

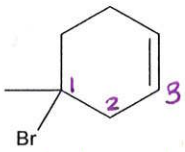
Organic Chemistry 1
Exam 3, Ch 7-8, Fall 2017

____/50
Rugg

13) Name the following compounds. (4 pts)

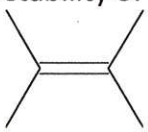


cis-3-methyl hex-2-ene
3-methyl hex-2E-ene

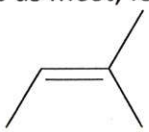


1-bromo-1-methyl cyclohex-3-ene

14) Identify the stability of the following alkenes as most, least, and middle. (3 pts)



most

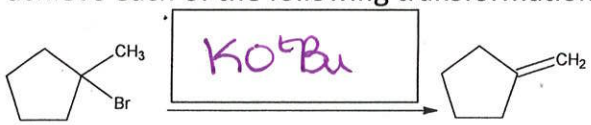


middle

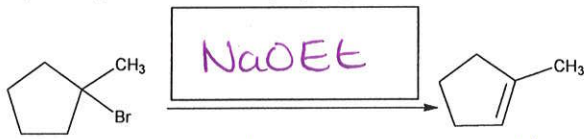
least

15) Can the trans version of the following alkene exist? (1 pt)  Yes (No)

16) Indicate whether you would use sodium ethoxide (NaOEt) or potassium tert-butoxide (KOtBu) to achieve each of the following transformations. Explain your choice. (4 pts)



Large base, takes the most available hydrogen

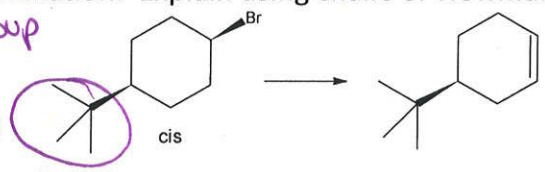


Smaller base, makes the more stable alkene

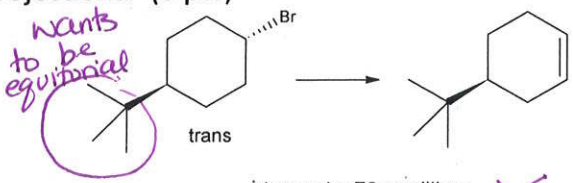
17) Below are two stereoisomers of 1-bromo-4-tert-butylcyclohexane, undergoing E2 reactions. The cis conformation quickly eliminates to the alkene, while the trans conformer is very slow at the elimination. Explain using chairs or Newman projections. (6 pts)

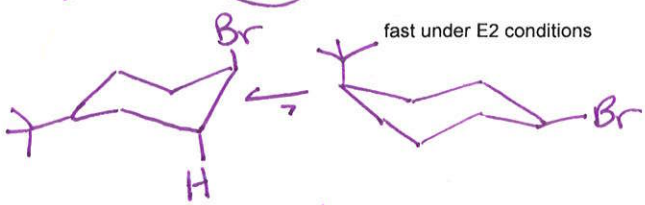
1pt - correct chair
2pt - anticoplanar

Large group wants to be equitorial

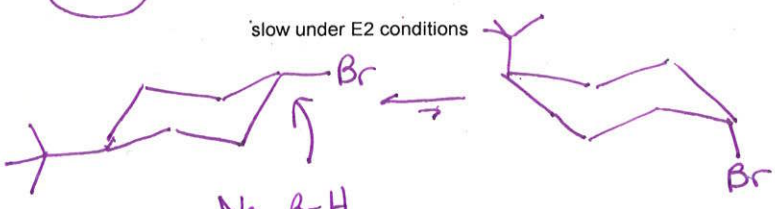


wants to be equitorial





this H is anti coplanar



No β-H that is anticoplanar, But this structure is preferred. Therefore it is slower.

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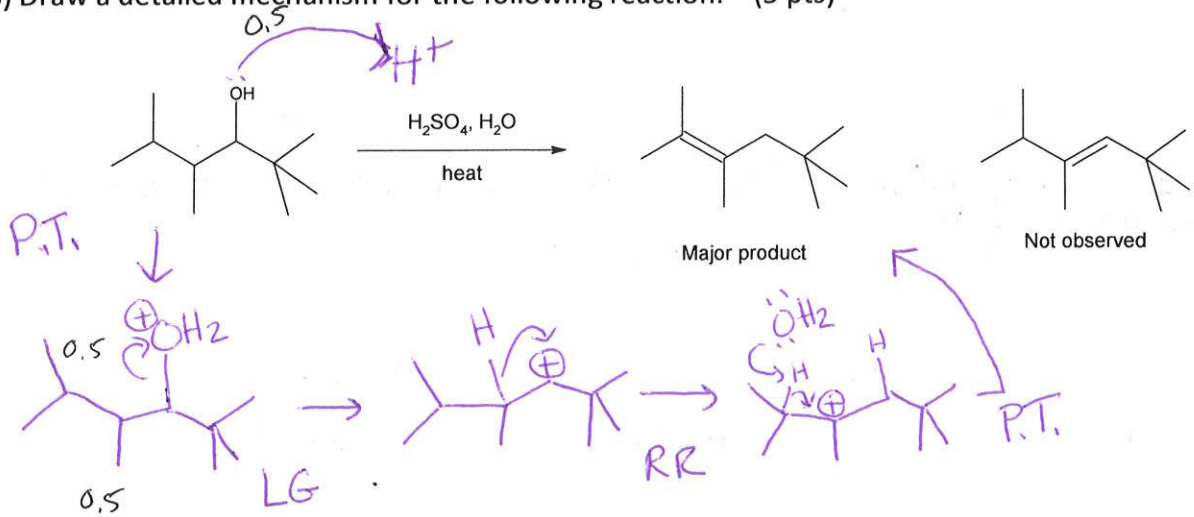
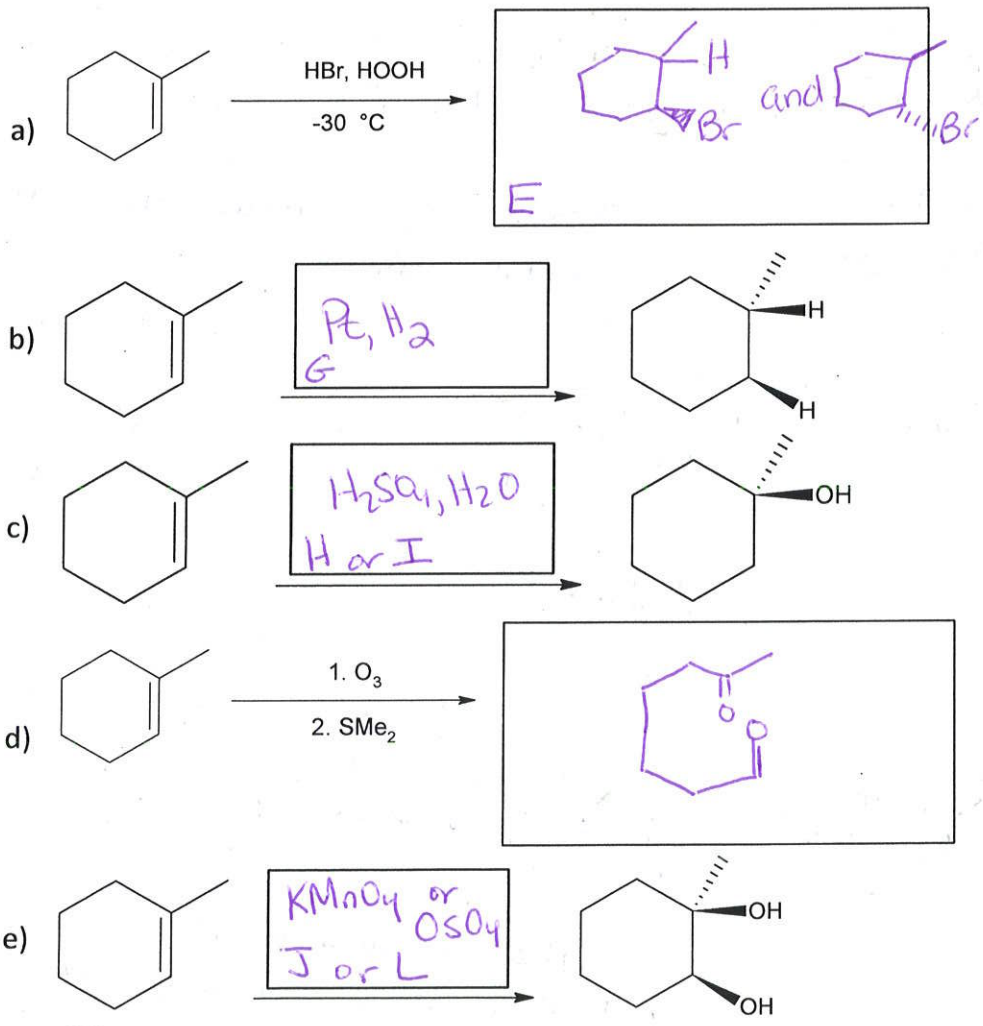
18) Draw a detailed mechanism for the following reaction. (5 pts)



19) Fill in the boxes. The boxes above the arrows are for the reagents, which are listed in the box on the right. For the products, indicate stereochemistry using wedges and hashes if needed. (2 pts for products, 1 pt for reagent, total of 7 pts)



Possible Reagents

A	1. BH_3 2. H_2O_2, NaOH
B	Br_2
C	Br_2, H_2O
D	HBr
E	HBr, HOOH
F	1. CH_3CO_3H 2. H^+, H_2O
G	H_2, Pt
H	H_2O, dil. H_2SO_4
I	1. $Hg(OAc)_2$, H_2O 2. $NaBH_4$
J	1. $KMnO_4$, 2. NaOH
K	1. O_3 2. SMe_2
L	1. OsO_4 2. $NaHSO_3/H_2O$

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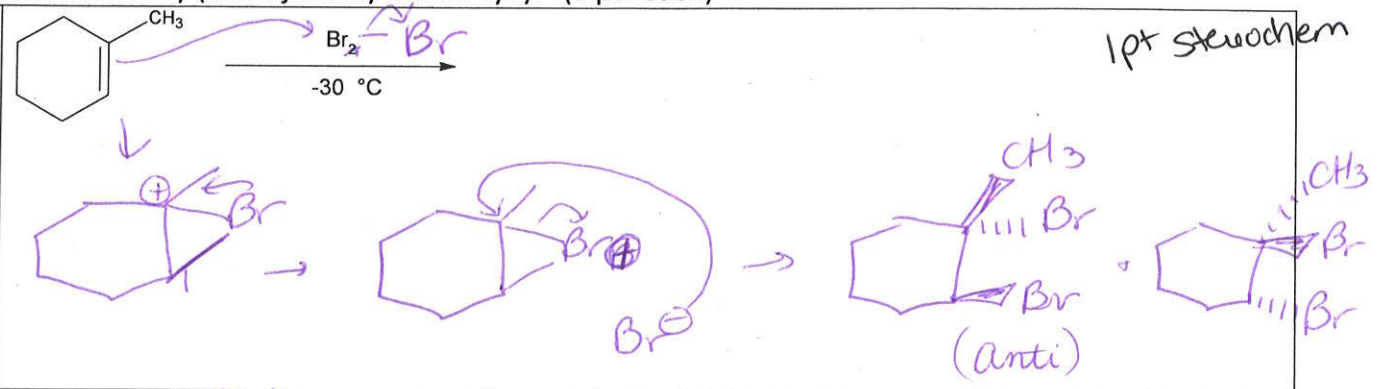
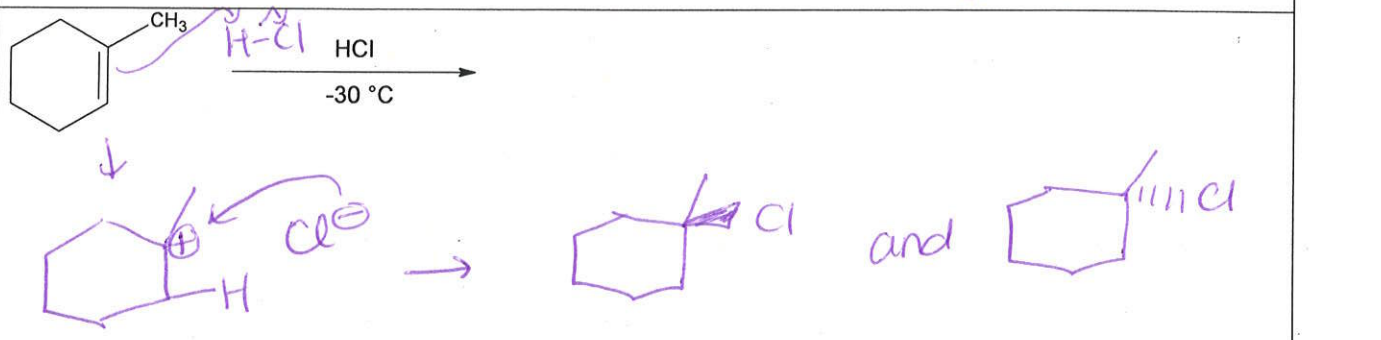
20) Draw the mechanism and predict the products for the following reactions. Be sure to account for regiochemistry, stereochemistry, and rearrangement. Use wedges and hashes to indicate stereochemistry (don't just say anti or syn). (5 pts each)

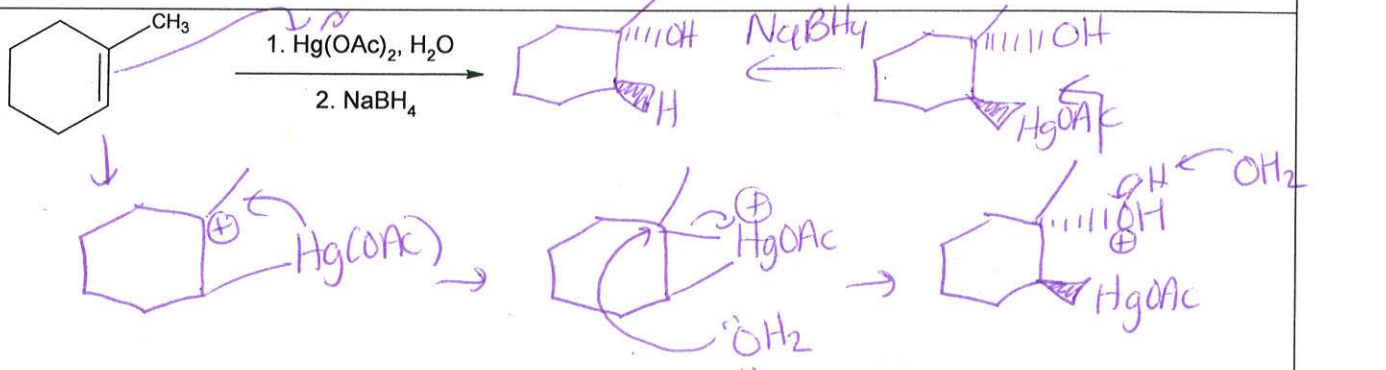
a)



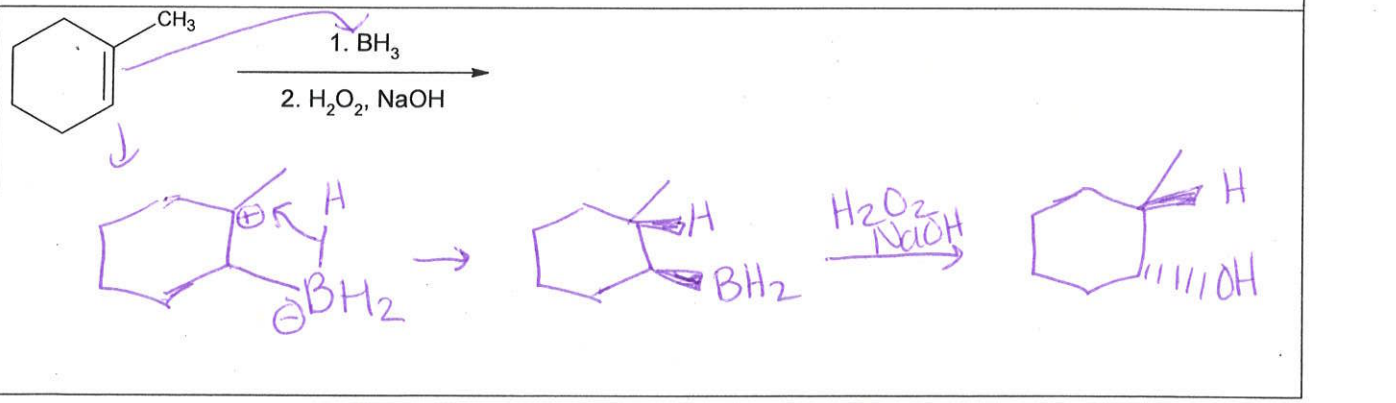
b)



c)



d)



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