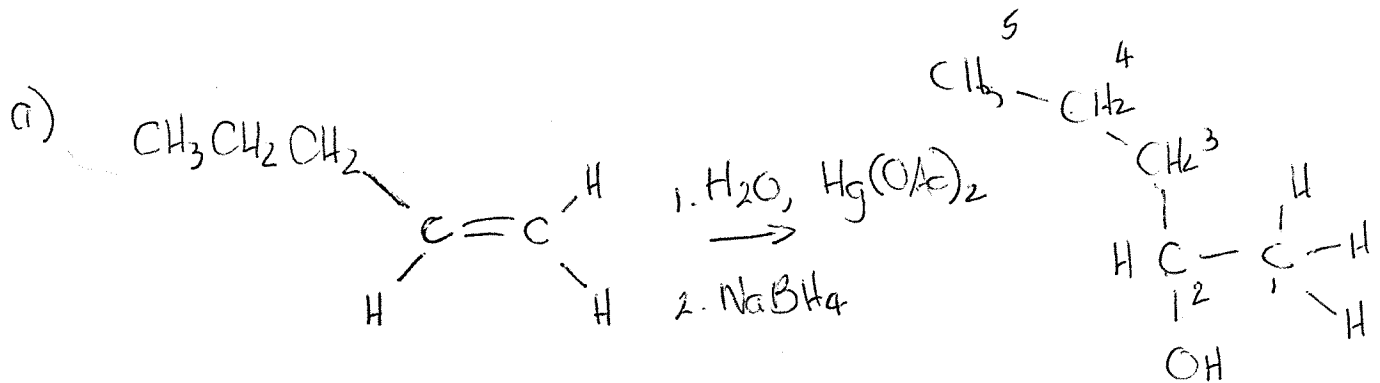
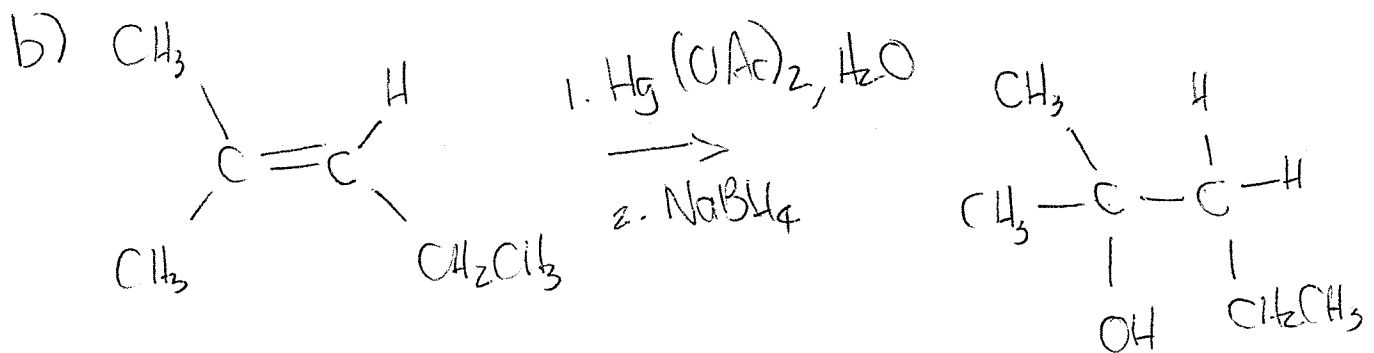


8.7



Oxymercuration occurs under kinetic conditions to give the more highly substituted product as the MAJOR product (MARKOVNIKOV)

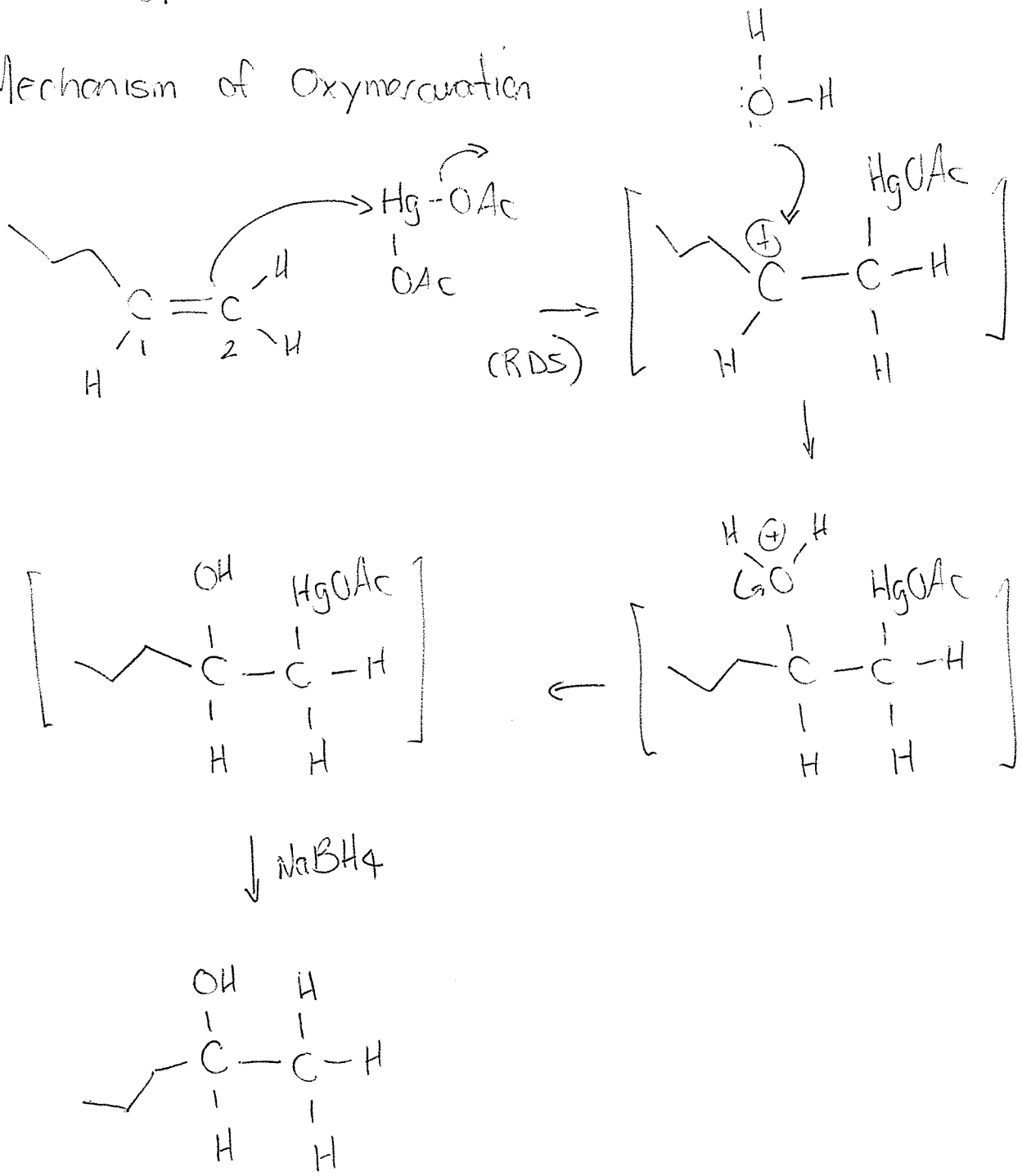
MAJOR PRODUCT
2-pentanol



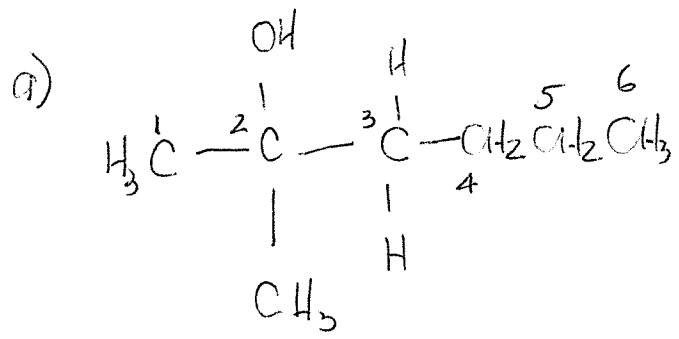
2-methyl-2-pentanol
MAJOR PRODUCT

8.7 (cont'd)

Mechanism of Oxymercuration

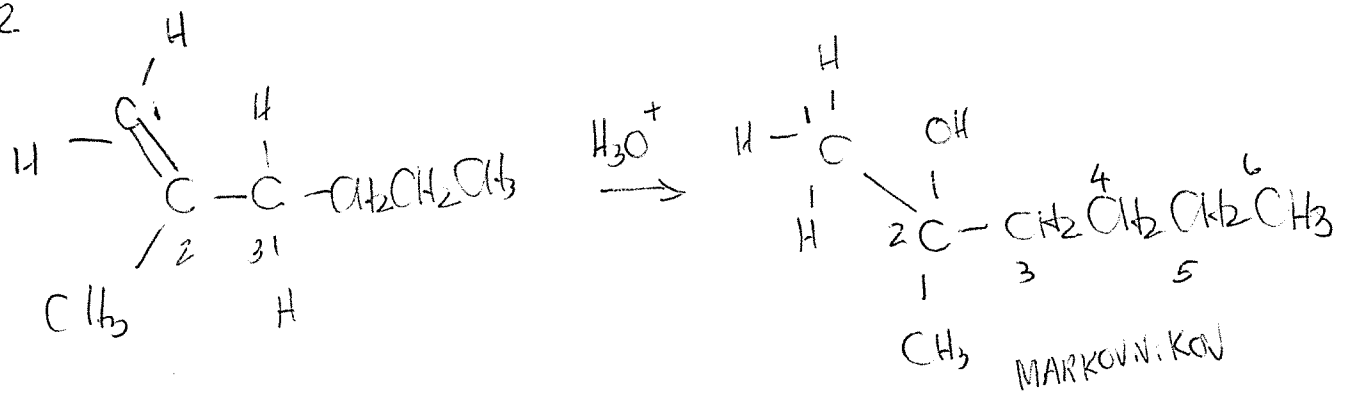


8.8. Alcohols can be prepared from alkenes by
 MARKOVNIKOV (H_3O^+ or 1. HgX_2, H_2O 2. $NaBH_4$)
 or ANTI MARKOVNIKOV addition (1. BH_3 2. $H_2O_2, NaOH$)

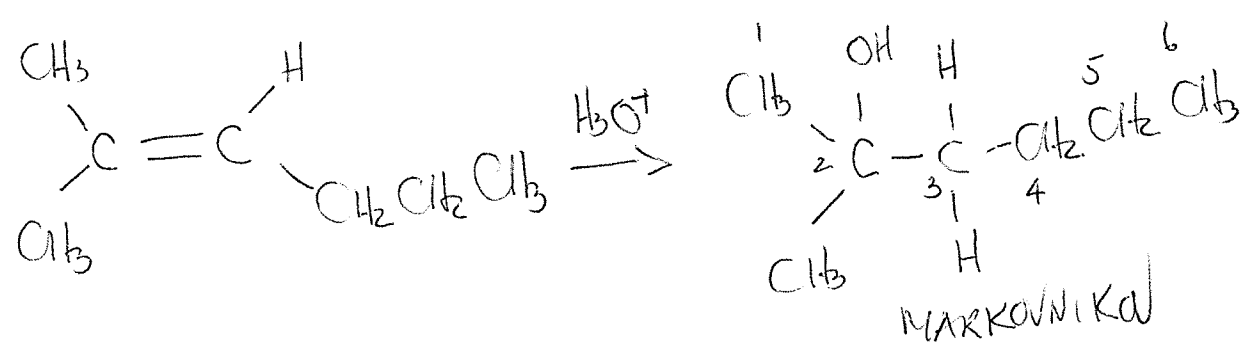


Alkene could be C_1-C_2 alkene
 or C_2-C_3 alkene.

C_1-C_2

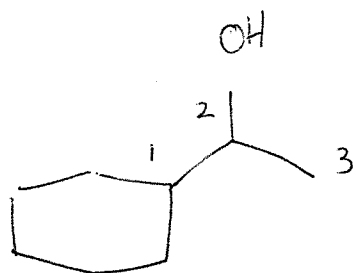


C_2-C_3



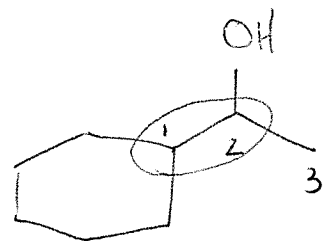
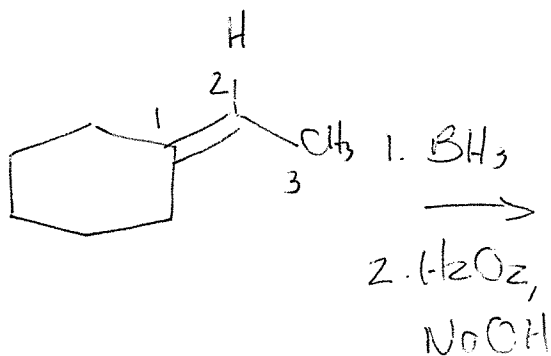
8.8 (cont'd)

b)



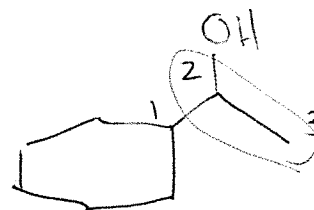
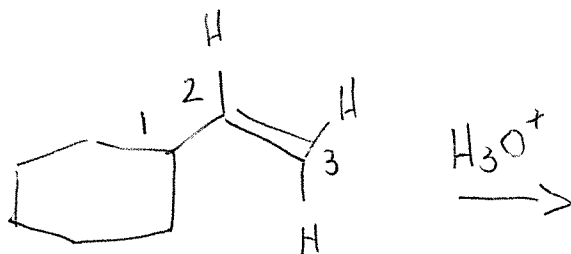
This alcohol could be derived from C₁-C₂ alkene or C₂-C₃ alkene

C₁-C₂



ANTI-MARKOVNIKOV
(least substituted alcohol)

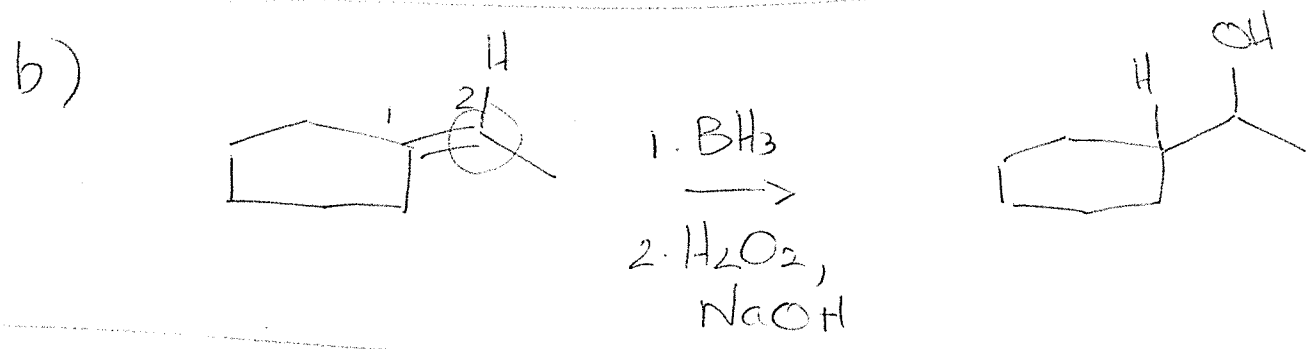
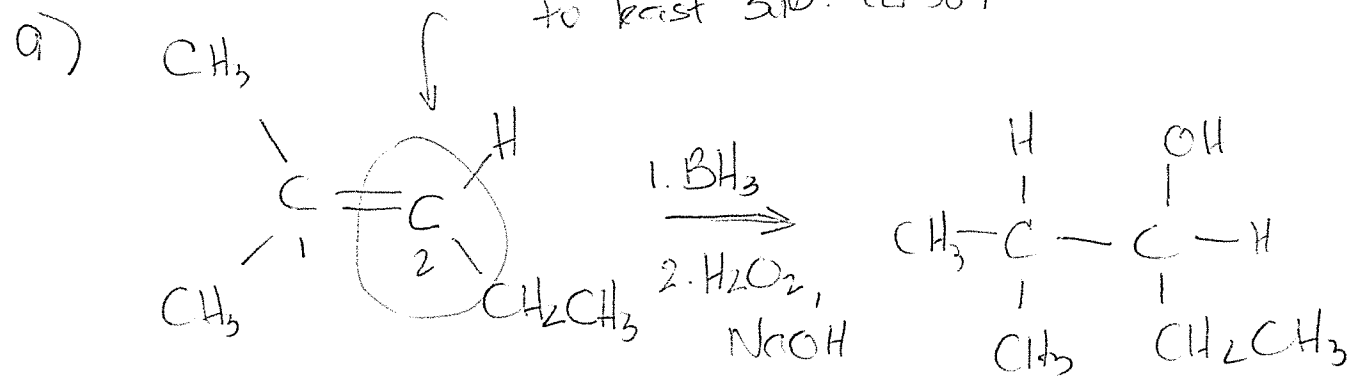
C₂-C₃



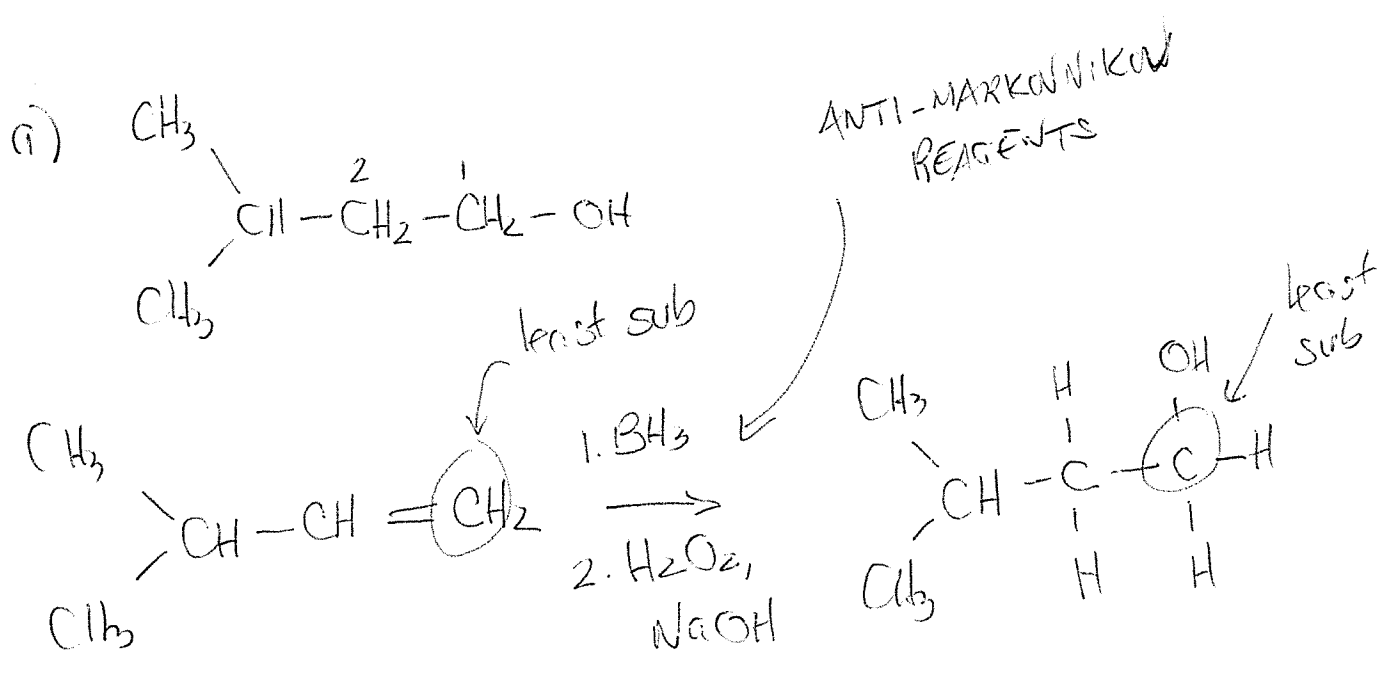
MARKOVNIKOV
(most substituted alcohol)

8.9

Anti-Markovnikov
-alcohol (OH) bonded
to least sub. carbon

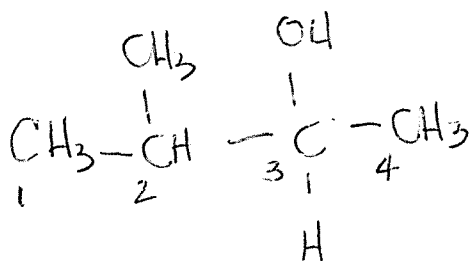


8.10



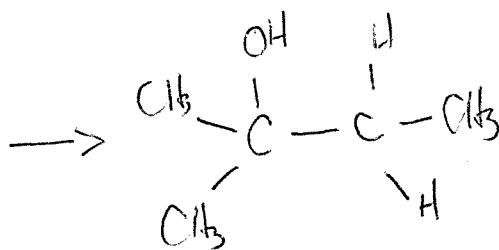
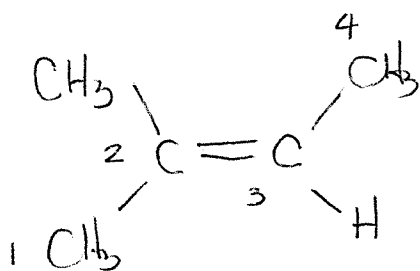
8.10 (cont'd)

b) To identify the alkene, number the atoms of the target alcohol. The OH group of the target alcohol must end up bonded to one of the two carbons of the π bond of the starting alkene.



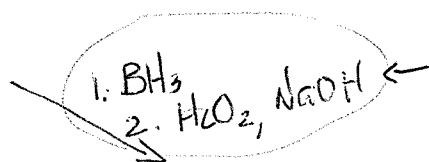
The alkene could be one with the π bond between the C₂-C₃ atoms or between the C₃-C₄ atoms

C₂-C₃



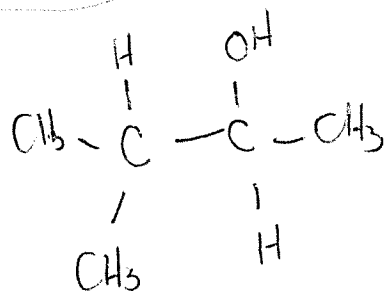
NOT the target alcohol

Anti Markovnikov



If this alkene is used as starting material both

H₃O⁺ and 1. HgX₂, H₂O 2. NaBH₄

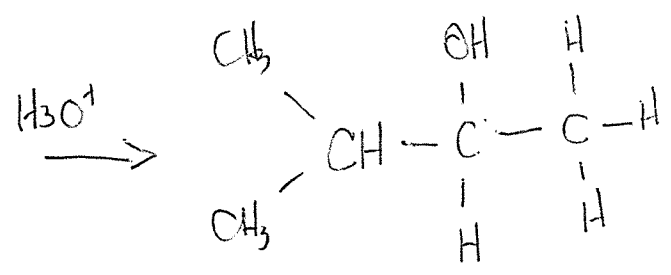
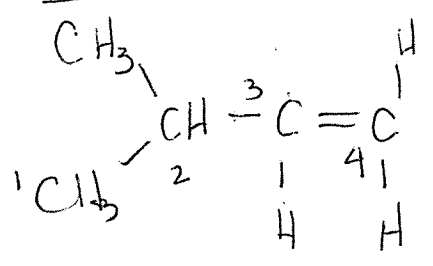


CORRECT ALCOHOL

Give the MARKOVNIKOV product as major product

8.10 (cont'd)

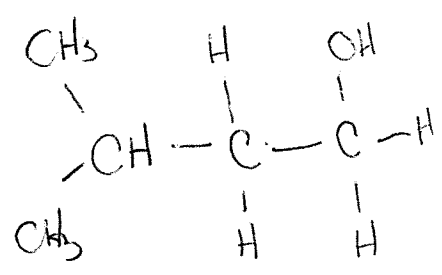
C₃-C₄:



If the C₃-C₄ alkene is used with H₃O⁺ or

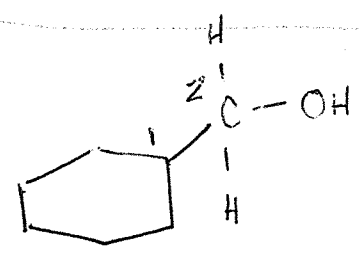
1. HgX₂, H₂O
2. NaBH₄, the MARKOVNIKOV product is formed as major product

1. BH₃
2. NaOH, H₂O₂

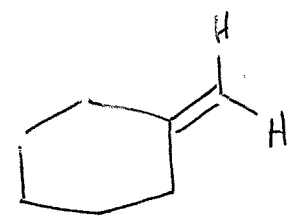


If 1. BH₃ 2. H₂O₂, NaOH is used, the wrong alcohol is generated as major product.

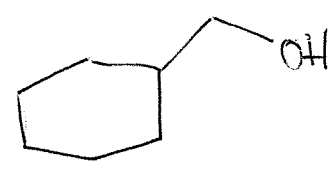
C.



must use this reagent H₃O⁺ or 1. HgX₂ 2. NaBH₄ give 3° alcohol as major.



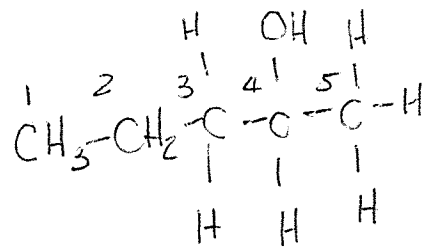
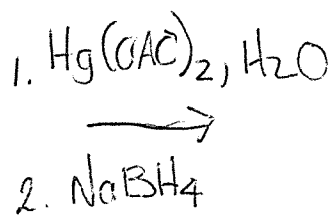
1. BH₃
2. H₂O₂, NaOH



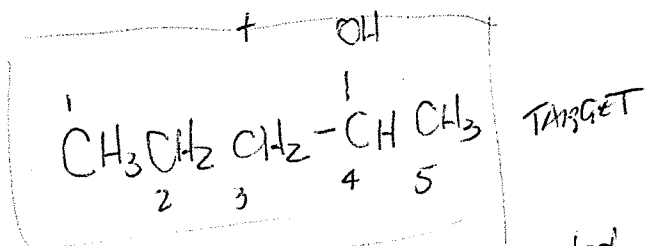
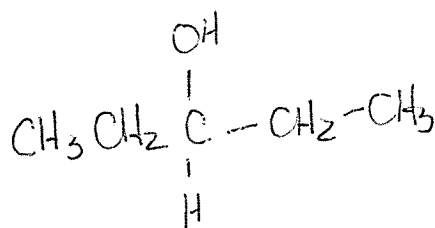
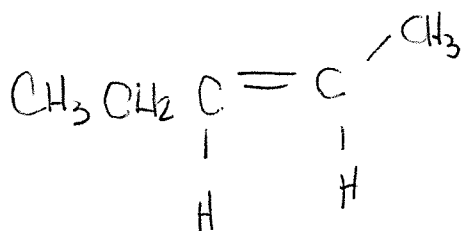
8.21

e)

?

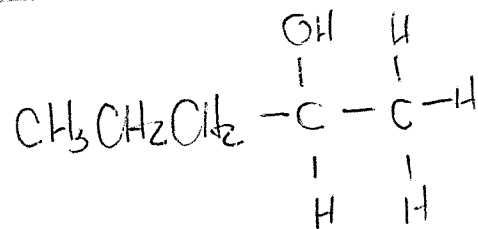
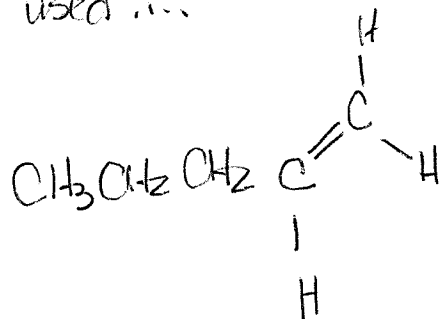


If C₃-C₄ alkene is used.....



Both products are generated as "major" since both are derived from equally stable 2° carbocations

If C₄-C₅ alkene is used.....

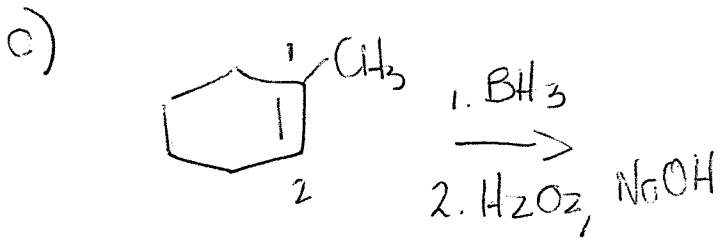


MAJOR PRODUCT

The C₄-C₅ alkene is a better choice for starting material.

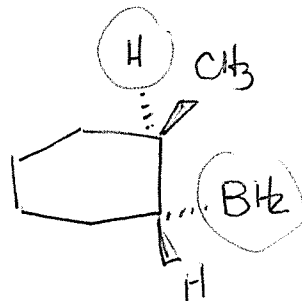
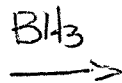
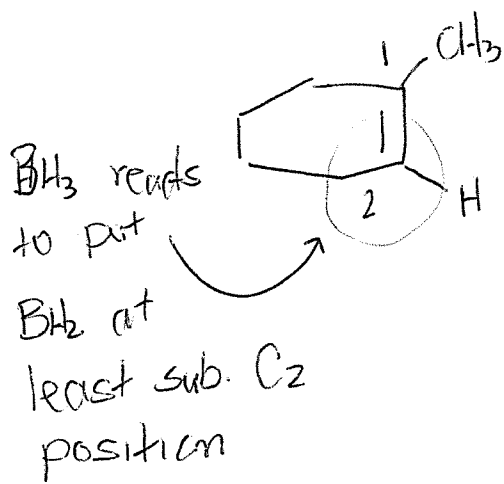
8.28

9.

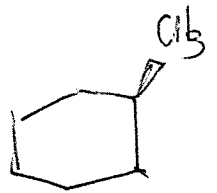
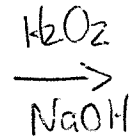


Hydroboration-oxidation occurs with ANTI-MARKOV-NIKOV regiochemistry.

It also occurs with SYN addition.

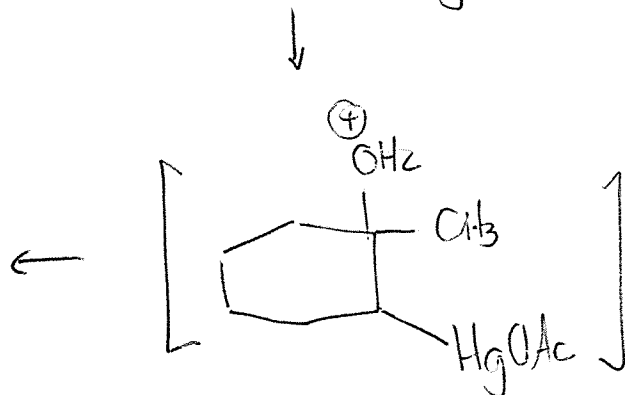
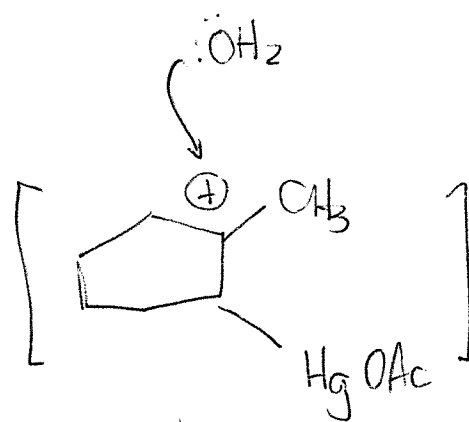
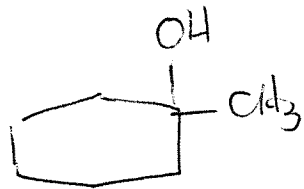
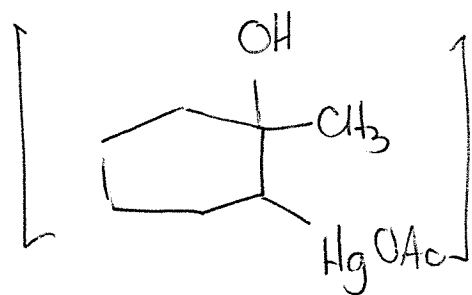
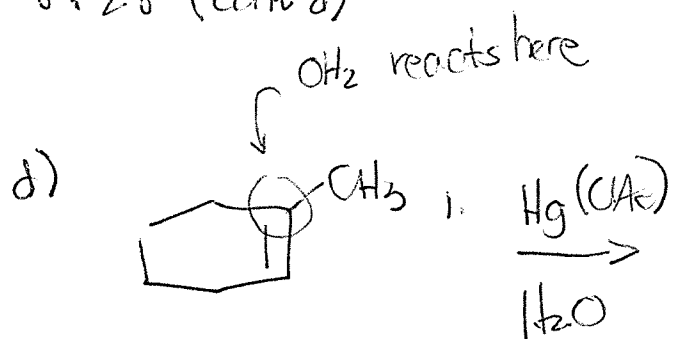


The H and BH_2 of BH_3 react w/ SYN addition (H and BH_2 are CIS oriented)



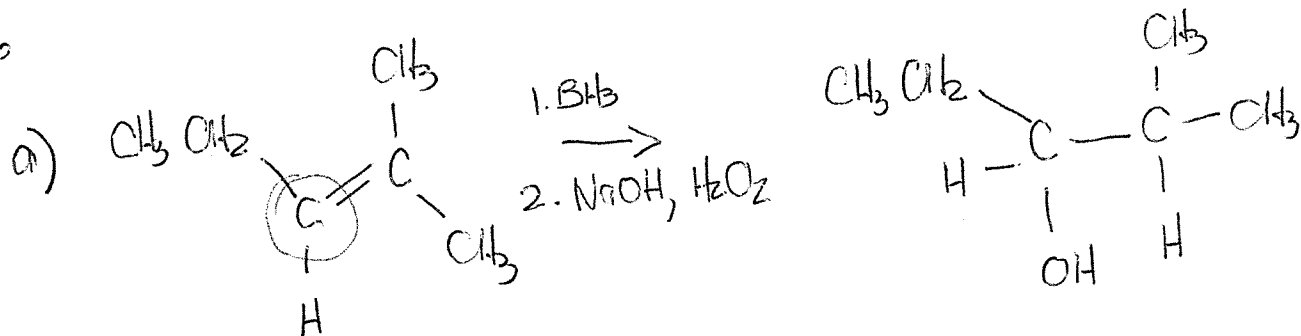
Oxidation replaces BH_2 with OH . Stereochemistry of BH_2 and OH is retained.

8.28 (cont'd)

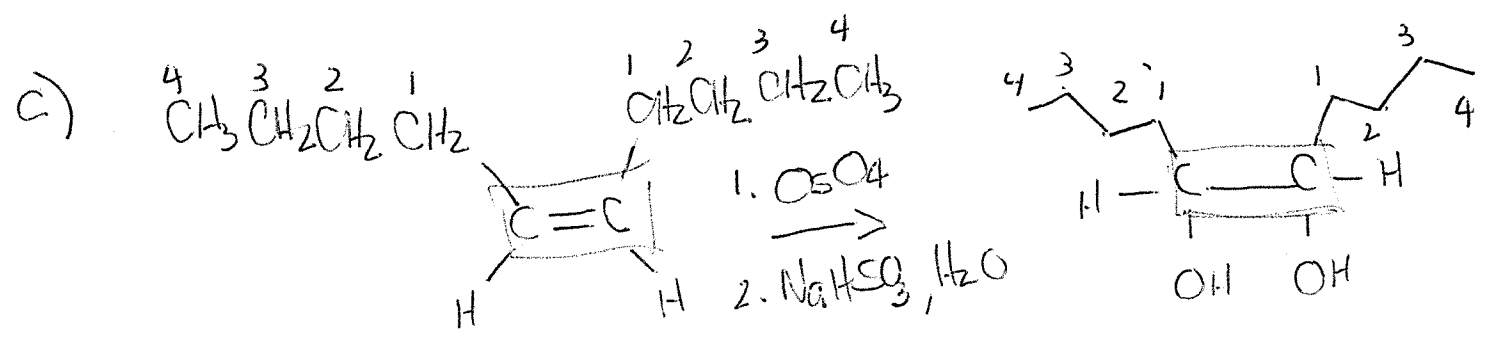
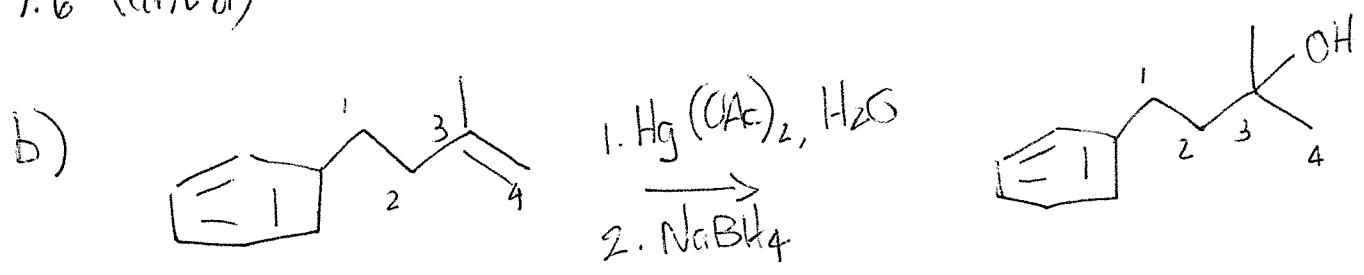


Oxymercuration / demercuration
occurs with MARKOVNIKOV
regiochemistry. The final
product has no stereochemistry.

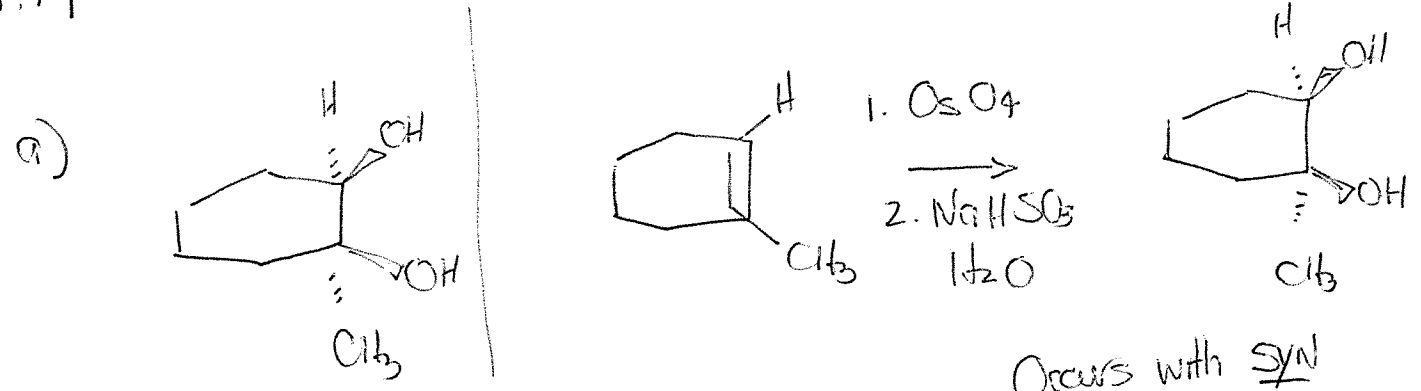
17.6



17.6 (cont'd)

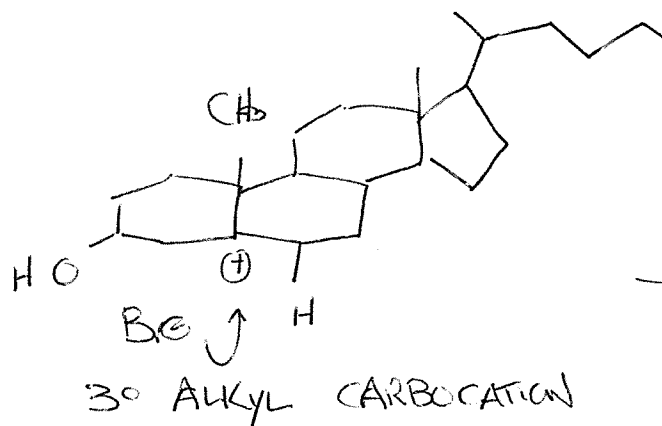
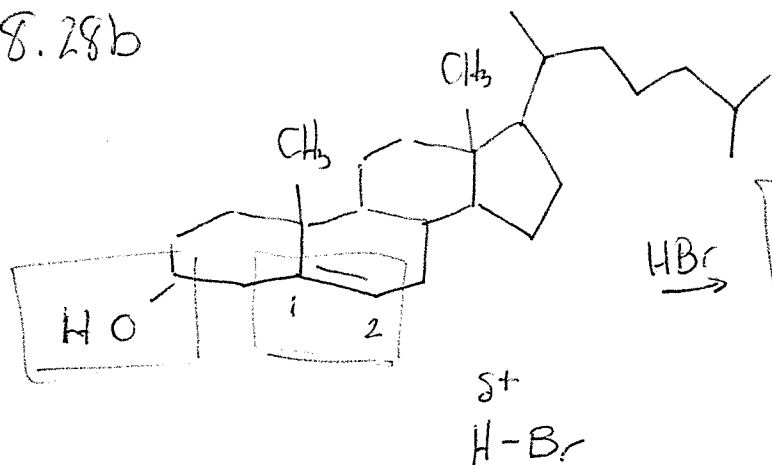


8.14

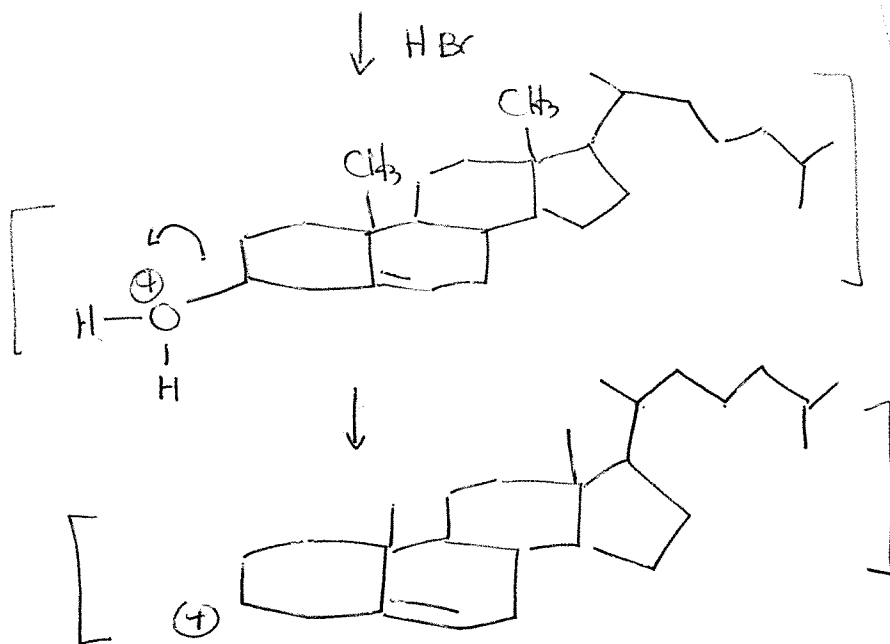


Occurs with syn stereochemistry. Two OH groups have cis orientation.

8.28b



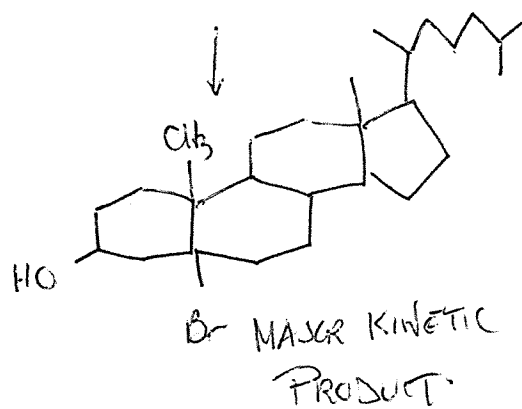
If HBr reacts w/ alcohol, 3° carbocation is generated in the RDS



2° ALKYL CARBOCATION

If alcohol reacts w/ HBr, a 2° carbocation is generated in the RDS

Since 3° C⁺ is more stable than 2° C⁺, it forms faster. The major kinetic product is the 3° alkyl bromide.



8.32c

