In-Class Exam III: Organic Chemistry I Alfred State College _____/100 pts
Wednesday 9 December 2015

Your Name: _____ 1 pt

3.1. Match-Maker Chemistry (2 pt each/ 22 pts)

Match the 8 items on the left with the most pertinent descriptor in the list on the right
(Several in the list below are not used.)

1)Bromine test for alkenes m
2)reagents for E-only alkene h
3)necessary for anti-Mark. addition of HBr across C=C k
4)Br_2/H_2O in CCl_4 a
5) dehydrohalogenation of alkyl halides c
6) Markovnikoff additions across C=C f or d
7)reagent needed for allylic substitution of Br on alkene g
8) mechanism for dehydration of alcohols b
9)necessary for Z-only alkene synthesis j
10)syn-hydroxylation i
11)Brown two step reagent for Mark. only addition to ROH h

a) makes halohydrins
b) E1
c)requires beta H
d) butylenes→ 2,2,4,4-tetramethylpentenes
e) ether (dry)
f) carbocation mechanism
g) NBS (N-bromosuccinimide)
h)NH_3 (l) and Na^o
i)$KMnO_4$ (aqueous,cold)
j) Pd black (Lindlars) and H_2
k) peroxides (H_2O_2)
l) S_N2
m) orange color disappears
n) B_2H_6

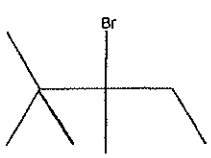
3.2 Eliminating Snacks (12 pts/ 2 pt for each correct line)

CIRCLE for both the dehydration and dehydrohalogenation *menus*, the effect of the listed variations on the rates on these two reaction types. **(n/a** means not applicable)

variation	effect on dehydration rate	effect on dehydrohalogenation rate
1) substrate concentration up	(up) n/a down	(up) n/a down
2) OH^- concentration increased	up (n/a) down	(up) n/a down
3) Rearrangement occurs	(yes) no	yes (no)
4) Primary H effects occur	yes (no)	(yes) no
5) Reaction can occur without βH	(yes) no	yes (no)
6) dominant reaction mechanism	(E1) E2 S_N1 S_N2	E1 (E2) S_N1 S_N2

3.3 Soothsaying (7 pts)

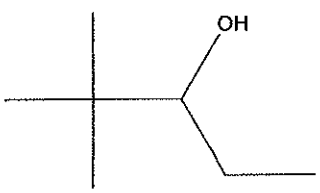
a)Predict all the possible (=can form) alkenes possible from the reaction shown below and **CIRCLE** the **major product** (3 pts)



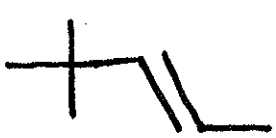
KOH/ethanol →

+

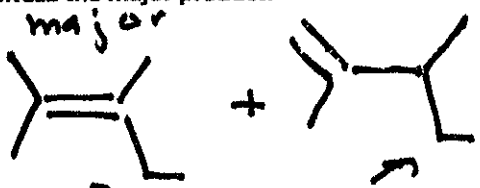
b)Predict all the possible alkenes possible (= can form) from the reaction below and **CIRCLE** the **major product:** (4 pts)



80% H_2SO_4/reflux →



major



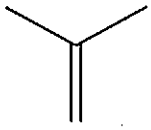
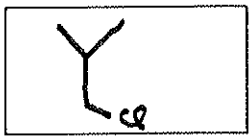
+

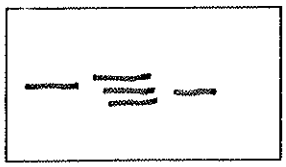
Via primary Carbocation

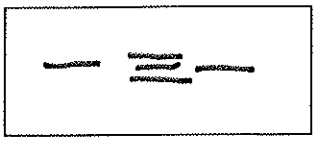
Via methyl shift

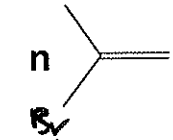
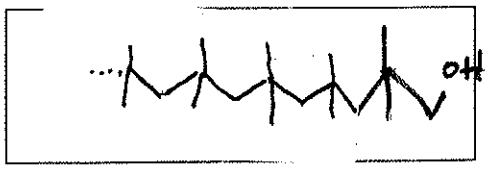
____/42 (includes name)

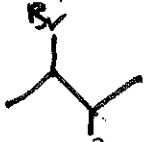
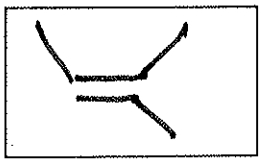
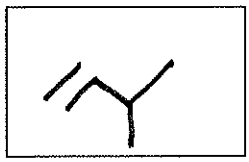
Fill in the reagents, products, solvents and/or conditions missing in the reactions below:

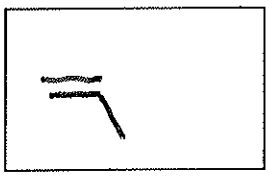
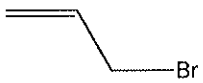
1)  + HCl → ether or glacial acetic acid; peroxides →  anti-Markovnikov addition

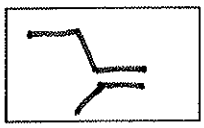
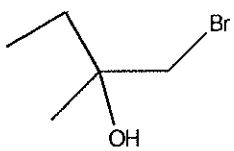
2)  + H_2; Pd Black, Lindlar's Catalyst →  (Z)-2-butene only

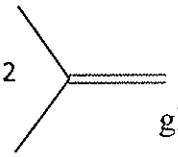
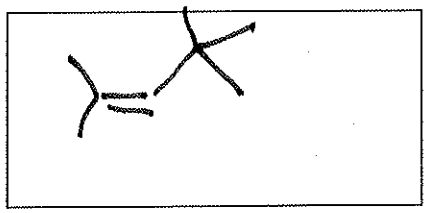
3)  + NH_3; Na^0 / $NH_3(l)$ →  E-Only product

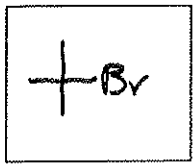
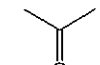
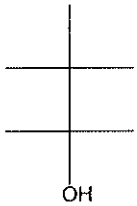
4)  peroxides (HOOH); light or heat →  polymerization

5)  2-bromo-3-methylbutane + KOH; ethanol (solvent) →  Major +  Minor

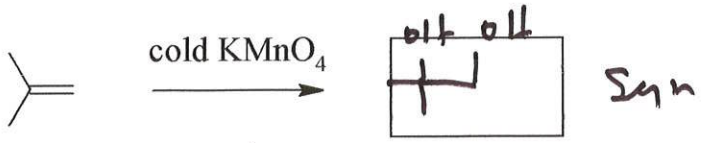
6)  + NBS; Neat or in ether with light → 

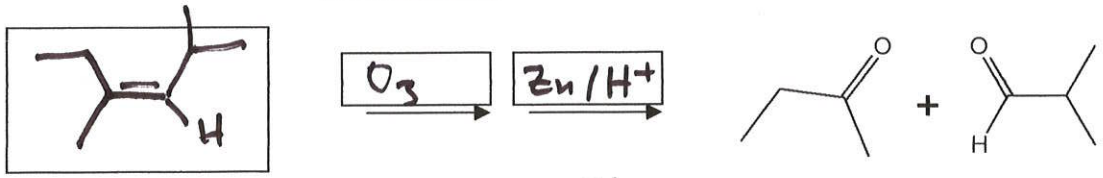
7)  + Br_2; wet CCl_4 → 

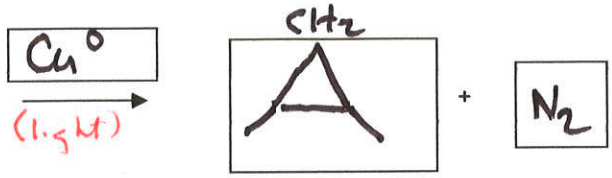
8)  2; H^+; glacial acetic acid=solvent →  alkene dimer

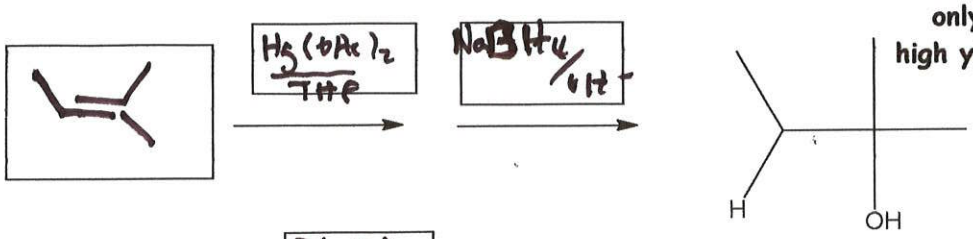
9)  + Mg; dry ether →  dry ether; H^+/H_2O, ice → 

___/20

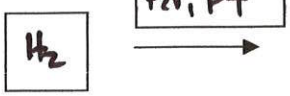
10) 

11) 

12) CH_2N_2 + 2-butene 

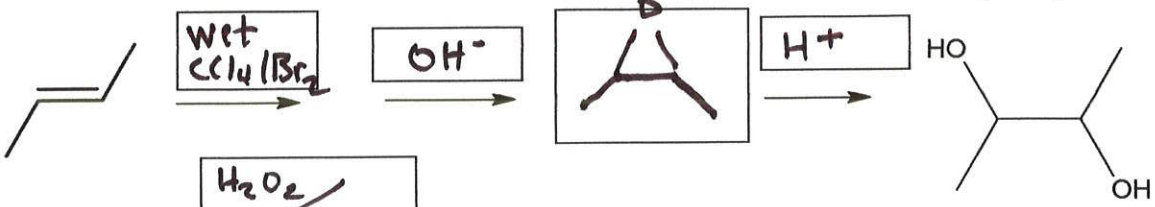
13) 

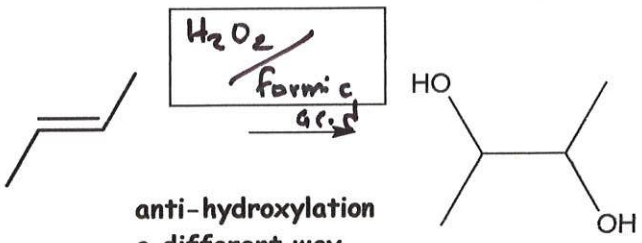
only product
high yield, fast

14) ethene + 

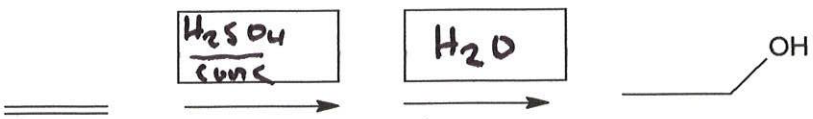
ethane

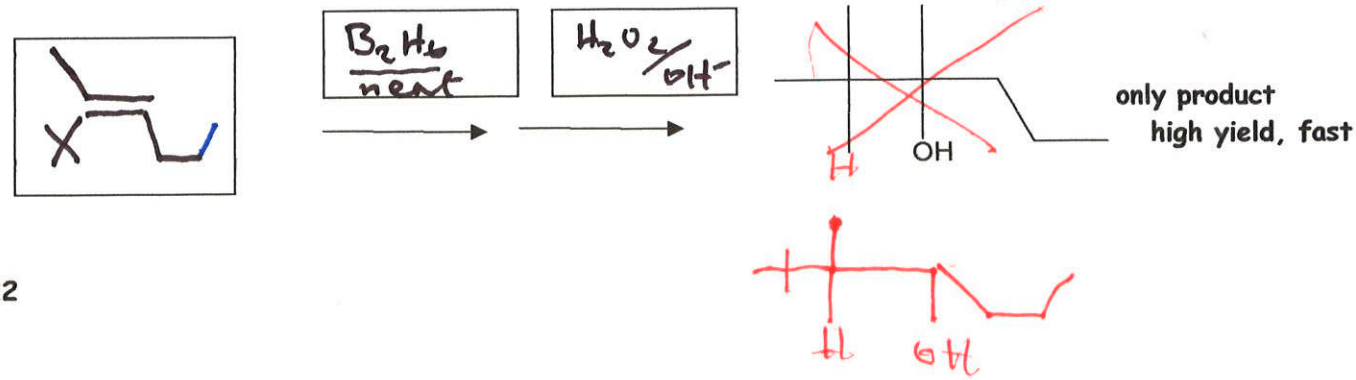
anti-hydroxylation

16) 

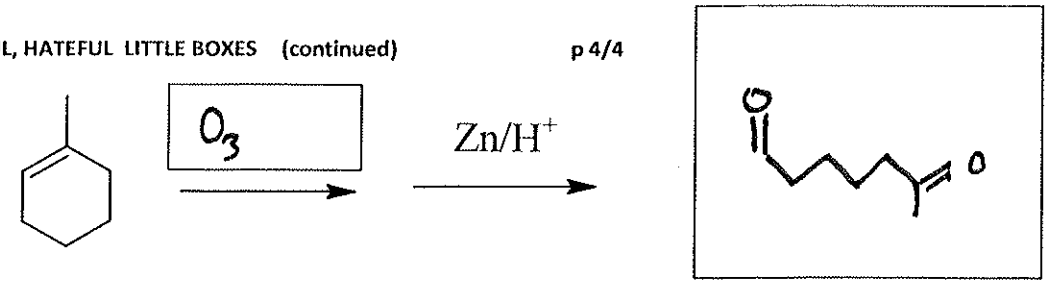
17) 

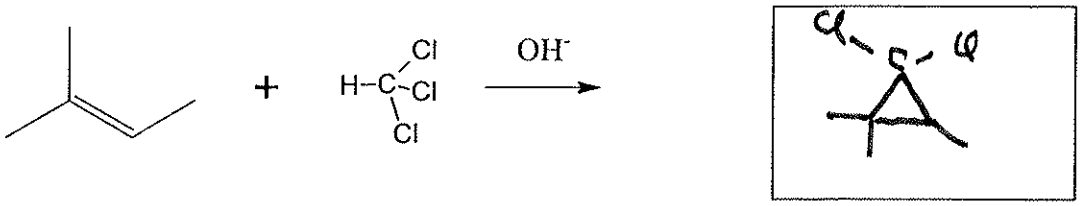
anti-hydroxylation
a different way

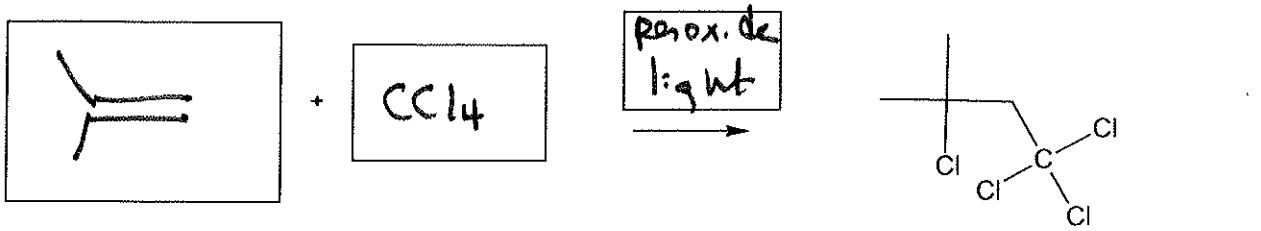
18) industrial route to ethanol 

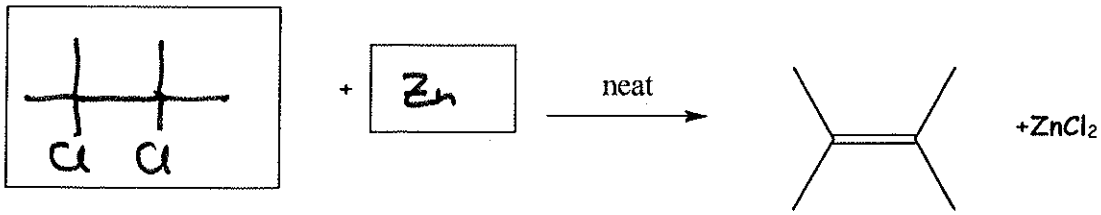
19) 

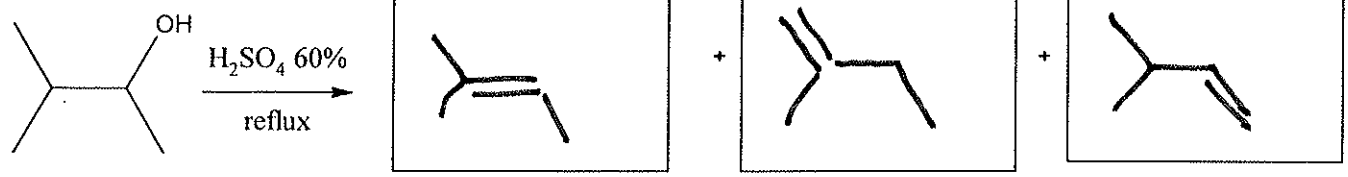
only product
high yield, fast

20) 

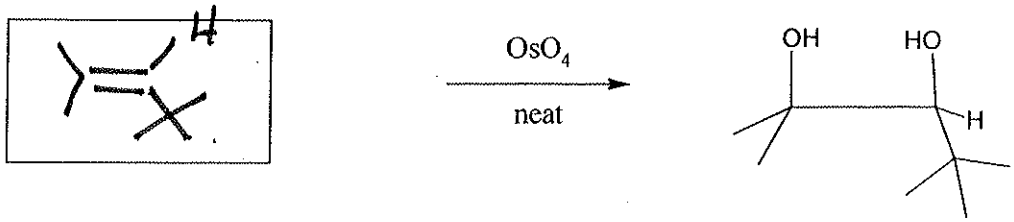
21) 

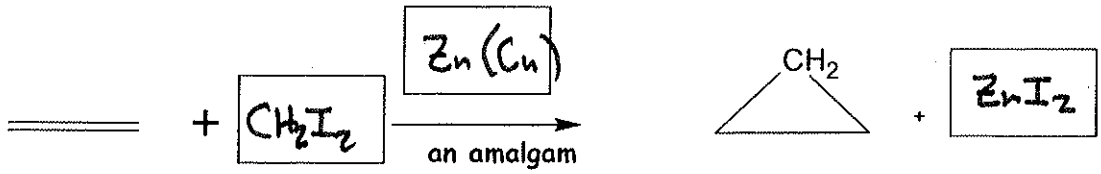
22) 

23) 

24) 

Major Minor (via rearrangement) Minor

25) 

27) 

28) hyphenated name of reaction 27 ??? Simmons-Smith

29) T/F (circle your answer)

Any day doing organic chemistry is a good day (T F eat shit and die, Fong)

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