**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.)

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)NH3 (l) and Nao

i)KMnO4 (aqueous,cold)

j) Pd black (Lindlars) and H2

k) peroxides (H2O2)

l) SN2

m) orange color disappears

n) B2H6

1)Bromine test for alkenes \_\_\_\_

2)reagents for E-only alkene \_\_\_\_

3)necessary for anti-Mark. addition of HBr across C=C \_\_\_\_

4)Br2/H2O in CCl4 \_\_\_\_

5) dehydrohalogenation of alkyl halides \_\_\_\_

6) Markovnikoff additions across C=C \_\_\_\_

7)reagent needed for allylic substitution of Br on alkene \_\_\_\_

8) mechanism for dehydration of alcohols \_\_\_

9)necessary for Z-only alkene synthesis \_\_\_\_

10)syn-hydroxylation \_\_\_\_

11)Brown two step reagent for anti Mark. only addition toROH **\_\_\_\_\_**

**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 **n**ot **a**pplicable)

 **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 SN1 SN2***  ***E1 E2 SN1 SN2***

* 1. **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% H2SO4/reflux**

**\_\_\_/42 (includes name)**

* 1. **THOSE HATEFUL, HATEFUL LITTLE BOXES (58 pts/ 1 pt each) p 2/4**

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



1)

 peroxides

2) +

 **( Z)-2-butene only**



3)

**E-Only product**

 +



4) **n**

(solvent)

5) +

 2-bromo-3-methylbutane +KOH

 **Major Minor**

Neat or in ether with light



6) +



  **wet CCl4**

7) +



8)

 2

 alkene

 dimer



9)

**+**



**\_\_\_/20**

* 1. **THOSE HATEFUL, HATEFUL LITTLE BOXES (continued) p 3/4**

 **show correction orientation**

**10)**





**11)**

**12) CH2N2 + 2-butene +**

 **only product**



**13) 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**

**\_\_\_/22**

* 1. **THOSE HATEFUL, HATEFUL LITTLE BOXES (continued) p 4/4**



**20)**

**21)**





**22)**

 **+**





**23) +**

 **+ZnCl2**

**24)**



 **+ +**

 **Major Minor (via rearrangement) Minor**



**25)**

**27)**



 +

 **an amalgam**

**28) hyphenated name of reaction 27 ??? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**29) T/F (circle your answer)**

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

**\_\_/17**