**HOMEWORK ASSIGNMENT #9 ORGANIC CHEMISTRY I**

(due Wednesday 14 Nov 2012)

Your name:\_\_\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_/25 pts

**9.1. Name or draw these alkenes. Use IUPAC rules.(if E, Z forms present, indicate which) 6 pts**









**(E)-7-chloro-2-octene 6-chloro-1-cyclohexenol\* isobutylene**

**Common**

**(also accepted: 3-chloro-1-cyclohexen-2-ol)\* 2-methylpropene**

**\*two different rules collide here: The first is to give precedence to the `most reactive group’ (OH) => it gets 1 position. The second is to minimize substituent count=> OH gets 2-count. From what seems the common practice, the former is the preferred rule though both yield specific and correct specifications of the structure.**



**3-methyl-2,7-octadienol**

**(Z) 2,2,5-trimethyl-3--hexene**

**9.2. Pathways to specific alkenes (2 pts each/ 8 pts total)**

Suggest a simple, 1-step route to Z-4-methyl-2-pentene Z form





1. Suggest a simple, 1-step route to E-4-methyl-2-pentene E form





1. What is the major product-if any- obtained by attempting to dehydrate 2,2,4,4-tetramethyl-3-pentanol ?



1. Is it possible to synthesize an alkene via dehydrohalogenation of 3-bromo-2,2,4,4-tetramethylpentane ? If yes, what are the likely product(s) ?



***No. There are no available βH in the compound. All β sites are occupied***

***by methyls***

**9.3. Parsing E1 vs E2 characteristics (11 pts)**

Assuming that by E1 we refer to the mechanism of alcohol dehydration to alkenes and by E2 we refer to the mechanism of dehydrohalogenation of alkyl halides to alkenes, circle which of these two mechanisms the various reaction properties below are connected to (can be both) 1 pt each

1) Primary H effect E1 **E2**

2) H+ catalyzed **E1** E2

3) Rearrangements occur **E1** E2

4) Base driven E1 **E2**

5) β-H always necessary E1 **E2**

6) Products obey Saitsev rule **E1 E2**

7) Reaction rate order: 3o>2o>1o  **E1 E2**

8) Involves a carbocation **E1** E2

9) Involves a 4-atom electron flow E1 **E2**

10) More than one product alkene possible **E1** **E2**

11) Competes with substitution reaction **E1** E2