

*II-3a ____ C ____ NC

**III-1a ____ C ____ NC

Chemistry 251
Worksheet 5

Name: _____

*A. (1.0 pts.) Write the equations for the initiation, propagation, and termination reactions for the formation of chloroethane from ethane and chlorine in the presence of u.v. light. Be sure to use curved arrows to indicate the flow of electrons.

**B. (1.0 pts.) Draw and label the geometric isomers for 3-hexene.

C. (2.0 pts.) Predict the products of monohalogenation for each of the following compounds. Predict the relative percentages of each isomeric product given the ratios ($1^\circ:2^\circ:3^\circ$) for chlorination are 1:3.9:5.3 and for bromination are 1:82:1640

1. Monochlorination of 2-methylbutane.

2. Monobromination of 2-methylbutane.

D. (2.0 pts.) Chlorination of 2-methylbutane yields four monochlorination products (A, B, C, and D) with the formula $C_5H_{11}Cl$. If each of these four products are further chlorinated, Compound A yields five products with the formula $C_5H_{10}Cl_2$; compound B three products; and compound C and D, each four products. Draw the condensed structural formulas and label the four monochloro products ($C_5H_{11}Cl$) as A, B, C, and D.

E. (2.0 pts.) Draw the structure for each of the following compounds, showing its stereochemistry.

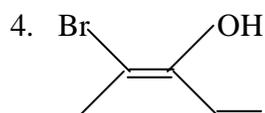
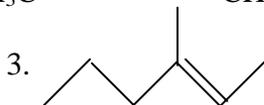
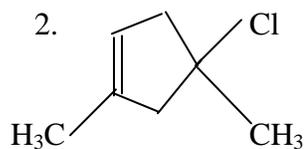
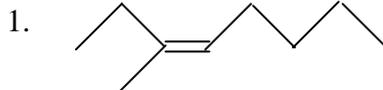
1. cis-3,4-dichloro-3-hexene.

2. (E)-4-bromo-2-chloro-2-pentene.

3. (Z)-1-bromo-1-chloro-2-butene.

4. (E)-1,3-dibromo-2-butene.

F. (2.0 pts.) Give the IUPAC name for each of the following alkenes.



G. (1.0 bonus pts.) One by-product observed in the chlorination of propane is 2,3-dimethylbutane. Show how 2,3-dimethylbutane could be formed and explain how its presence helps to substantiate mechanism for the chlorination of propane.