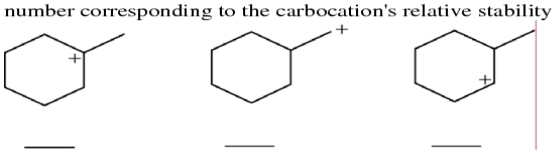
Organic Chemistry II: Review Worksheet

Chapter 7: Alkenes: Reactions and Synthesis

Chapter 11: Reactions of Alkyl Halides: Nucleophilic Substitutions and Eliminations

In order to more fully understand the nature of reactions of Organic Chemistry, we need to review what happens with reactions with alkenes in Chapter 7 and nucleophilic substitutions in Chapter 11.

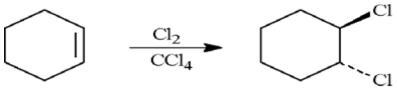
1. Rank the carbocations below in order of increasing stability (least stable = 1; most stable = 3). Place the number corresponding to the carbocation's relative stability in the blank below the structure.



Cyclohexene

To answer the questions below consider the following reaction:

When cyclohexene reacts with chlorine in carbon tetrachloride the *trans*-dihalide is formed.



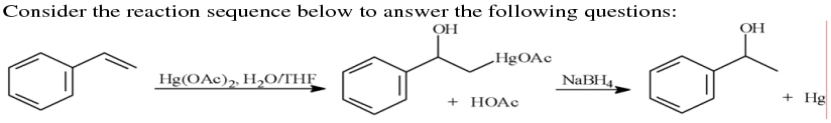
2. Refer to Cyclohexene. Since the two chlorine atoms add to opposite faces of the cyclohexene double bond, we say that the reaction occurs with:

a. syn stereochemistry
b. cis stereochemistry
c. anti stereochemistry
d. retention of stereochemistry

3. Refer to Cyclohexene. The observed stereochemistry of addition of chlorine to cyclohexene is explained by the intermediacy of a:
a. cyclonium ion
b. Carbocation
c. Carbine
d. chloronium ion

Reaction 7-1

Consider the reaction sequence below to answer the following questions:



4.Refer to Reaction 7-1. In the second step of this reaction sequence, the organomercury compound is treated with sodium borohydride, $NaBH_4$, to yield the alcohol product. This replacement of a carbon-mercury bond with a carbon-hydrogen bond is termed:
a) an oxidation b) a reduction c) a hydroxylation d) a cycloaddition