



Present

The Deep-Fried World of Organic Chemistry (Part 2)

1997 Cerebellum Corporation • 800-VCR-REVU

I. Introduction to Organic Reactions

- A. Functional Groups
- B. Organic Reactions
 - 1. addition
 - 2. elimination
 - 3. substitution
 - 4. rearrangement
 - 5. homolytic cleavage
 - 6. heterolytic cleavage
- C. Reaction Energy Diagrams
 - 1. endothermic reactions
 - 2. exothermic reactions

II. The Alkenes

- A. Introduction
- B. Naming Alkenes
- C. Alkene Structure
 - 1. double bonds
 - 2. *cis*- and *trans*-isomers
 - 3. stereoisomers
 - 4. EZ system of nomenclature
 - 5. steric strain

III. Electrophilic Addition Reactions

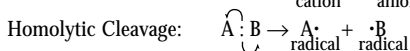
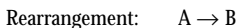
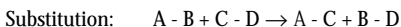
- A. Addition of HX to an Alkene
 - 1. carbocation
- B. Markovnikov's Rule
 - 1. reaction energy diagram
 - 2. energy minimum
 - 3. energy maximum
- C. Hammond Postulate

PART 2

Functional Groups

1. A functional group is always the same atom or group of atoms
 2. A functional group always behaves the same way in a reaction
 3. Reactions take place at functional groups; if you know where the functional group is, you know where the reaction is going to take place
 4. If you know where the functional group is and how the functional group behaves in a reaction, then you know where the reaction will occur, and you know what kind of reaction is going to take place
-

Organic Reactions

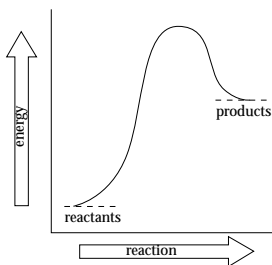


nucleophile: "nucleus-lover"; species with an electron-rich atom;
has extra electrons which it can donate to an electron-poor atom

electrophile: "electron-lover"; electron-poor species;
can accept electrons from electron-rich species

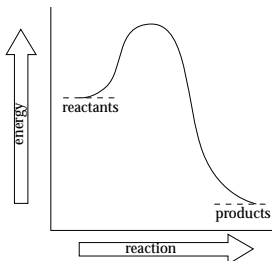
endothermic reaction:

energy is taken into the reaction;
products at higher energy level
than reactants



exothermic reaction:

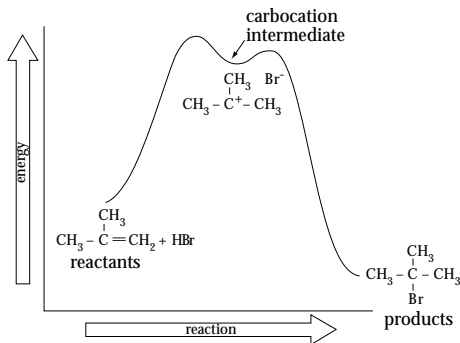
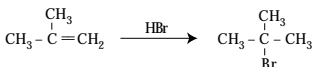
energy is released from the reaction;
reactants at higher level than products



Naming Alkenes:

1. Find the longest continuous chain of carbons which includes the double bond. Name it using the prefix appropriate for the number of carbons in the parent chain and the suffix -ene.
2. Number the carbons of the parent chain, starting at the end of the chain closer to the double bond. Make sure the double bond has the lowest number possible.
3. Name and number the substituents.

Addition of HX to an Alkene:

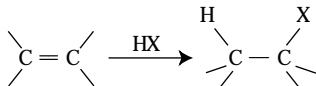


Markovnikov's Rule:

When adding a hydrogen and a halogen (or any other substituent) to an alkene, the hydrogen will prefer to bond to the carbon of the double bond which has more hydrogens; the halogen (or other substituent) will prefer to bond to the carbon of the double bond which has more substituents.

Hammond Postulate:

The transition state resembles the structure of the nearest stable species; in an endothermic reaction, the transition state resembles the product; in an exothermic reaction, the transition state resembles the reactants.



X=Cl, Br, or I

Markovnikov's Rule is observed