
Introduction to Alkene Reactions

HX Addition to an Alkene

Key Points for HX Addition to an Alkene

1. Mechanism involves a carbocation intermediate
2. Markovnikov's Rule applies
3. Reaction has two-steps and is exothermic
4. Carbocation rearrangement is possible

Markovnikov's Rule

Markovnikov's Rule:
The electrophile adds to the sp^2 carbon that is bonded to
the greater number of hydrogens

Alkene Reactions

X₂ Addition to an Alkene

Key Points for X₂ Addition to an Alkene

1. Mechanism involves a tri-cyclic intermediate
2. Anti-addition is observed

Halohydrin Formation

Key Points for Halohydrin Formation

1. Mechanism involves a tri-cyclic intermediate
2. Anti-addition is observed
3. Markovnikov's Rule applies: Br adds to the carbon with a greater number of hydrogens and OH adds to the other

Acid Catalyzed Hydration

Key Points for Acid Catalyzed Hydration

1. Mechanism involves a carbocation intermediate
2. Markovnikov's Rule applies: H adds to the carbon with a greater number of hydrogens and OH adds to the other
3. Carbocation rearrangement is possible

Alcohol Addition to Alkenes

Key Points for Alcohol Addition to Alkenes

1. Mechanism involves a carbocation intermediate
2. Markovnikov's Rule applies: H adds to the carbon with a greater number of hydrogens and the alcohol adds to the other
3. Carbocation rearrangement is possible

Oxymercuration-Reduction

Key Points for Oxymercuration-Reduction

1. Mechanism involves a tri-cyclic intermediate
2. Markovnikov's Rule applies: H adds to the carbon with a greater number of hydrogens and OH adds to the other
3. Carbocation rearrangement is **NOT** possible

Alkoxymercuration-Reduction

Key Points for Alkoxymercuration-Reduction

1. Mechanism involves a tri-cyclic intermediate
2. Markovnikov's Rule applies: H adds to the carbon with a greater number of hydrogens and the alcohol adds to the other
3. Carbocation rearrangement is **NOT** possible

Hydroboration-Oxidation

Key Points for Hydroboration-Oxidation

1. Mechanism involves a tri-alkylborane intermediate
2. Syn addition is observed; OH and H
3. Anti-Markovnikov's Rule applies: H adds to the carbon with LESS hydrogens and OH adds to the other

Addition of Hydrogen to an Alkene: Hydrogenation

Key Points for Hydrogenation

1. Reaction takes place on a catalytic floor
2. Syn addition is observed

Peroxyacid Addition to an Alkene: Epoxide Formation

Carbocation Rearrangement

Carbocation rearrangement will happen if in doing so:

1. a more stable carbocation is generated
2. a more stable ring is generated; less ring strain