8.1 Preparation of Alkenes: A Preview of Elimination Reactions

8.1 Exercises

Questions

Q8.1.1
In elimination reactions there tends to have a mixture of products. What are the two possible alkene products for the reaction of 2-bromo-2-methylpentane with NaOH?

Q8.1.2
Predict the E/Z isomers for the following molecule when reacted with H₂SO₄.

Solutions

S8.1.1

S8.1.2
8.2 Halogenation of Alkenes: Addition of X2X2

8.2 Exercises

Questions

Q8.2.1
Predict the product of the product of 1,2-dimethylcyclopentene reacting with Br₂ with proper stereochemistry.

Q8.2.2
Predict the products for 1,2-dimethylcyclopentene reacting with HCl, give the proper stereochemistry. What is the relationship between the two products?

Solutions

S8.2.1

S8.2.2

These compounds are enantiomers.

8.3: Halohydrins from Alkenes: Addition of HOX
8.3 Exercises

Questions

Q8.3.1

Predict the product of the following reaction:

\[ \text{NBS} \quad \text{H}_2\text{O} \]

Q8.3.2

When butene is treated with NBS in the presence of water, the product shows that the bromine is on the least substituted carbon, is this Markovnikov or anti-Markovnikov?

Solutions

S8.3.1

S8.3.2

Since the bromine is the first addition to the alkene, this addition would be an anti-Markovnikov addition.

8.4 Hydration of Alkenes: Addition of H2OH2O by Oxymercuration

8.4 Exercises

Questions

Q8.4.1

In each case, predict the product(s) of these reactants of oxymercuration.
Q8.4.2

Propose the alkene that was the reactant for each of these products of oxymercuration.

Solutions

S8.4.1

S8.4.2
8.5 Hydration of Alkenes: Addition of H2O by Hydroboration

8.6 Reduction of Alkenes: Hydrogenation

8.6 Exercises

Questions

Q8.6.1

Predict the products if the following alkenes were reacted with catalytic hydrogen.

Solutions

S8.6.1
8.7 Oxidation of Alkenes: Epoxidation and Hydroxylation

8.8 Oxidation of Alkenes: Cleavage to Carbonyl Compounds

8.8 Exercises

Questions

Q8.8.1

What would you expect the products to be from the reaction of cis-2-pentene with m-chloro-peroxybenzoic acid? Show the stereochemistry of the final product.

Q8.8.2

Give a reaction scheme with starting alkenes and required reagents to produce the following compounds.
Solutions

S8.8.1

S8.8.2
8.9 Addition of Carbenes to Alkenes: Cyclopropane Synthesis

8.9 Exercises

Questions

Q8.9.1

Predict the following products. Will they be the same product?

\[ \text{hv} \]

\[ \text{hv} \]

Solutions

S8.9.1

No they will not be the same product, they will be isomers of each other.

8.10 Radical Additions to Alkenes: Chain-Growth Polymers

8.10 Exercises
Questions

Q8.10.1

Propose the monomer units in the following polymers:

Solutions

S8.10.1

8.11 Biological Additions of Radicals to Alkenes

8.12 Stereochemistry of Reactions: Addition of H2O to an Achiral Alkene

8.13 Stereochemistry of Reactions: Addition of H2O to a Chiral Alkene

8.13 Exercises

Questions

Q8.13.1

Predict the products of the following reaction showing stereochemistry.
The products (Markovnikov) are diastereomers of one another.