Alkenes Quiz Answer Key PDF

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How does the presence of a double bond in alkenes influence their physical properties compared to alkanes?

Alkenes typically have lower boiling points and are more reactive than alkanes due to the presence of a double bond.

What is the significance of geometric isomerism in alkenes, and how does it affect their properties?

Geometric isomerism in alkenes affects their properties by creating different isomers (cis and trans) that have varying physical and chemical characteristics, such as boiling points and reactivity.

Which of the following reactions is NOT typical for alkenes?

A. Hydrogenation
B. Combusttion
C. Halogenation
D. Nitration ✓

What are the characteristics of the double bond in alkenes? (Select all that apply)

A. Contains one sigma bond ✓
B. Contains one pi bond ✓
C. Allows free rotation
D. Is stronger than a single bond ✓

Discuss the role of alkenes in the production of polymers and give examples of common polymers derived from alkenes.

Alkenes play a vital role in the production of polymers through a process called polymerization, where they react to form long-chain molecules. Common polymers derived from alkenes include

polyethylene (used in plastic bags), polypropylene (used in containers and textiles), and polystyrene (used in insulation and packaging materials).

Outline the steps involved in the hydration of alkenes and the type of product formed.

The steps involved in the hydration of alkenes are: 1) Protonation of the alkene to form a carbocation, 2) Nucleophilic attack by water on the carbocation, and 3) Deprotonation to form the alcohol product. The type of product formed is an alcohol.

Which of the following alkenes is a gas at room temperature?

A. Propene ✓
B. Butene
C. Pentene
D. Hexene

Which of the following statements about alkenes are true? (Select all that apply)

A. They are more reactive than alkanes. ✓
B. They are saturated hydrocarbons.
C. They can form polymers. ✓
D. They have a higher boiling point than alkanes of similar size.

Describe the process of polymerization and its significance in the context of alkenes.

Polymerization involves the addition of alkenes, which contain carbon-carbon double bonds, to form long-chain molecules or polymers through processes like addition polymerization. This transformation is crucial for producing synthetic materials like polyethylene and polystyrene, which are widely used in everyday products.

What is the IUPAC name for the simplest alkene?

A. Methane
B. Ethene ✓
C. Propane
D. Ethyne

Which type of bond is present in alkenes that is not found in alkanes?

A. Single bond
B. Double bond ✓
C. Triple bond
D. Ionic bond

What is the general formula for alkenes?

A. CnH2n+2
B. CnH2n ✓
C. CnH2n-2
D. CnHn

In which of the following solvents are alkenes typically soluble? (Select all that apply)

A. Water
B. Hexane ✓
C. Benzene ✓
D. Ethanol

Which of the following are typical reactions of alkenes? (Select all that apply)

A. Addition ✓
B. Substitution
C. Polymerization ✓
D. Elimination

Explain why alkenes are more reactive than alkanes.

Alkenes are more reactive than alkanes because they contain a carbon-carbon double bond, which is more reactive than the single bonds found in alkanes.

Which of the following are products of the halogenation of alkenes? (Select all that apply)

A. Alkanes
B. Dihaloalkanes ✓

C. Alcohols
D. Haloalkanes ✓

What is the geometry around the carbon atoms in an alkene double bond?

A. Linear
B. Tetrahderal
C. Trigonal planar ✓
D. Bent

What type of isomerism is exhibited by alkenes due to restricted rotation around the double bond?

A. Structural isomerism
B. Optical isomerism
C. Geometric isomerism ✓
D. Conformational isomerism

Which of the following are industrial applications of alkenes? (Select all that apply)

A. Production of plastics ✓
B. Fuel for combustion engines
C. Manufacture of detergents ✓
D. Synthesis of alcohols ✓

Which catalyst is commonly used in the hydrogenation of alkenes?

A. Iron
B. Platinum
C. Copper
D. Nickel ✓