

Alkynes Quiz Answer Key PDF

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What is the suffix used in the nomenclature of alkynes?

- A. -ane
- B. -ene
- C. -yne ✓**
- D. -ol

What are the products of the complete combustion of an alkyne?

- A. Carbon dioxide ✓**
- B. Water ✓**
- C. Carbon monoxide
- D. Oxygen

Which of the following are characteristics of alkynes?

- A. Contain a carbon-carbon triple bond ✓**
- B. Are typically non-polar ✓**
- C. Have a bent molecular geometry
- D. Exhibit sp hybridization ✓**

What type of hybridization do the carbon atoms in a triple bond exhibit?

- A. sp^3
- B. sp^2
- C. sp ✓**
- D. $sp^3 d$

Which of the following is a common use of ethyne (acetylene)?

- A. Fuel for cars
- B. Refrigerant
- C. Welding torches ✓**
- D. Fertilizer

Which safety precautions should be taken when handling alkynes?

- A. Use in a well-ventilated area ✓**
- B. Wear protective equipment ✓**
- C. Store near open flames
- D. Avoid inhalation ✓**

Which compounds can be formed by the oxidation of alkynes?

- A. Alcohols
- B. Acids ✓**
- C. Ketones ✓**
- D. Ethers

What is the general formula for acyclic alkynes?

- A. C_nH_{2n+2}
- B. C_nH_{2n}
- C. C_nH_{2n-2} ✓**
- D. C_nH_{2n-4}

Which of the following are true about the solubility of alkynes?

- A. Soluble in water
- B. Soluble in organic solvents ✓**
- C. Insoluble in water ✓**
- D. Soluble in acids

Explain why alkynes are more reactive than alkanes.

Alkynes are more reactive than alkanes due to the presence of a carbon-carbon triple bond, which has high electron density and can easily participate in addition reactions.

Describe the process and significance of hydrogenation in alkynes.

Hydrogenation involves adding hydrogen to alkynes in the presence of a catalyst to convert them into alkanes, reducing unsaturation and increasing stability.

What role do alkynes play in industrial applications? Provide examples.

Alkynes are used as starting materials in the synthesis of various chemicals, such as pharmaceuticals and polymers. Ethyne is used in welding torches.

How does the linear geometry of alkynes affect their chemical properties?

The linear geometry results in a lack of steric hindrance, making alkynes more accessible for reactions and influencing their reactivity and interaction with other molecules.

Discuss the environmental implications of using alkynes in industrial processes.

The use of alkynes can lead to emissions of volatile organic compounds (VOCs), contributing to air pollution. Proper handling and disposal are necessary to minimize environmental impact.

What is the result of hydrating an alkyne in the presence of an acid and mercury catalyst?

- A. Alcohol
- B. Alkane
- C. Ketone or aldehyde ✓
- D. Ether

What is the bond angle around the carbon atoms in an alkyne?

- A. 90°
- B. 109.5°
- C. 120°

D. 180° ✓

Which reaction involves the addition of hydrogen to an alkyne?

- A. Halogenation
- B. Hydrogenation ✓**
- C. Hydration
- D. Oxidation

Which physical property is common among alkynes?

- A. Soluble in water
- B. Non-polar ✓**
- C. High melting point
- D. Conduct electricity

Which reactions can alkynes undergo?

- A. Addition ✓**
- B. Substitution
- C. Polymerization ✓**
- D. Combustions ✓**

Explain the significance of IR spectroscopy in identifying alkynes.

IR spectroscopy is significant for identifying alkynes due to the characteristic absorption peak of the carbon-carbon triple bond stretch, which helps in distinguishing them from other hydrocarbons.