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Organic Chemistry: Current Research

Short Communication

Alkenes & Alkynes

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ABSTRACT

Alkenes contain a covalent bond that's composed of one sigma and one pi bond between two carbon atoms. The sigma bond has similar properties to those found in alkanes, while the pi bond is more reactive. The carbon atoms within the covalent bond are sp2 hybridized, forming a planar structure. Rotation round the covalent bond is disfavored, so alkenes form fairly stable isomers counting on the positioning of substituents on an equivalent (cis) or opposite (trans) sides of the covalent bond. These isomers are called diastereoisomers.

Keywords: Isomers: Reactivity

INTRODUCTION

Physical Properties of Alkenes

The melting and boiling points of alkenes are determined by the regularity of the packing, or the closeness, of those molecules. Alkene isomers which will achieve more regular packing have higher melting and boiling points than molecules with an equivalent formula but weaker dispersion forces. Alkenes are non-polar, and that they are both immiscible in water and fewer dense than water. they're generally soluble in organic solvents. Additionally, they are doing not conduct electricity.

Reactivity of Alkenes

Alkenes are more reactive than their related alkanes thanks to the relative instability of the covalent bond . they're more likely to participate during a sort of reactions, including combustion, addition, hydrogenation, and halogenations reactions. Alkenes also can be reacted, typically within the presence of a catalyst, to make polymers.

Reactions of Alkenes and Alkynes

Alkenes and alkynes are generally more reactive than alkanes thanks to the electron density available in their pi bonds. Especially, these molecules can participate during a sort of addition reactions and may be utilized in polymer formation.

Addition Reactions

Unsaturated hydrocarbons can participate during a number of various addition reactions across their double or triple bonds. These addition reactions include catalytic hydrogenation (addition of H2), halogenation (reaction with X2, where X may be a halogen), and hydrohalogenation (reaction with H-X, where X may be a halogen), among others.

Cycloaddition

Alkenes undergo diverse cycloaddition reactions. Most notable is that the Diels – Alder reaction with 1, 3-dienes to offer cyclohexenes.

This general reaction has been extensively developed, and electrophilic alkenes and alkynes are especially effective dienophiles. Cycloaddition processes involving alkynes are often catalyzed by metals.

Hydrogenation

In the presence of a catalyst—typically platinum, palladium, nickel, or rhodium—hydrogen are often added across a triple or a covalent bond to require an alkyne to an alkene or an alkene to an alkane. In practice, it's difficult to isolate the alkene product of this reaction, though a poisoned catalyst—a catalyst with fewer available reactive sites—can be wont to do so. because the hydrogen is immobilized on the surface of the catalyst, the triple or double bonds are hydrogenated during a syn fashion; that's to mention , the hydrogen atoms increase an equivalent side of the molecule.

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CONCLUSION

Large amounts of ethylene are produced from gas via thermal cracking. it's a crucial staple for the synthesis of variety of plastics.

REFERENCES

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