Name:

**Chapter 3 Test Review**

**Vocabulary** (3 Questions)

|  |  |  |
| --- | --- | --- |
| **Term** | **Definition** | **Example** |
| Alkene |  |  |
| Alkyne |  |  |
| Conjugated |  |  |
| Cumulated |  |  |
| Non-Conjugated/Isolated |  |  |

**Naming Alkenes/Alkynes** (6 Questions)

1. CH3CH2=CH2=CH3 6. 4-Nonyne

2. CH3CH2CH2CH=CH2 7. 3-Hexene

3. CH3CH2CH2C**≡**CCH3 8. Why is 6-decene not possible? What would this molecule be called? Draw it.

4. CH3CH2**≡**CH2CH2C**≡**CH

5. CH3=CH2CH2CH2C**≡**CH 9. Draw 1,3-dimethyl-2,4-cyclopentadiene

**Cis/Trans** (1 Question)

1. Name the molecule below. 2. Draw the molecule trans-2-methyl-3-hexene

**E/Z Naming** (2 Questions)

1. Name the molecules below. 2. Draw (Z)-3-bromo-2-chloro-2-pentene



**Bond Chart** (2 Questions)

|  |  |  |
| --- | --- | --- |
| **Features** | **Alkene** | **Alkyne** |
| Rotation |  |  |
| Bond Length |  |  |
| Bond Angle |  |  |
| Geometry |  |  |

**Orbitals and Bonds** (2 Questions)

|  |  |  |
| --- | --- | --- |
| **Type of Bond** | **What types of Organic Molecules contain these bonds?** | **Strength of bond** |
| Sigma |  |  |
| Pi |  |  |

|  |  |  |
| --- | --- | --- |
| **Organic Molecule** | **Type of Bond Hybridization** | **Drawing of Bond Types Present** |
| Alkane |  |  |
| Alkene |  |  |
| Alkyne |  |  |

**Distillation** (2 Questions)

1. What occurs during distillation?

2. If you have high weight oil, where will it condense?

3. If you have low weight oil, where will it condense?

4. As temperature increases throughout the distillation process, are you seeing more alcohol or water?

How do you know?

**Cracking** (1 Question)

1. What molecules do you begin with in the cracking process?

2. What two molecules do you end with?

3. Crack C12H26

**Alkene Reactions** (5 Questions)

1. Halogen Addition Reactions:

2 hexene +Cl2

2. Hydration Reactions

2-methyl-3-heptene +H2O

3. Hydrogenation Reactions

2,3-dimethyl-3-nonene + H2

4. Oxidation Reactions

4-methyl-2-pentene + KMnO4

5. Ozonolysis

4-methyl-2-pentene

**Markovinokoff’s Rule** (3 Questions)

1. Explain Markovnikoff’s Rule

2. Did any of the problems from the previous section of alkene reactions display a need for Markovnikoff’s rule? If yes, explain which one(s).

**Carbocations** (1 Question)

1. Determine the type of carbocation in each problem below.

 +

* CH3=CH2CHCH2C**≡**CH

+

* CH2CH2CH2CH2C**≡**CH

2. Which is more stable? Why?

**Conjugated Diene** (3 Questions)

**1 Mole**

1. Write an equation for the reaction of 2,4-hexadiene and 1 mole of chlorine.

2. Show both possible carbocations including resonance structures for 2,4-hexadiene and 1 mole of chlorine.

**2 Moles**

1. Write an equation for the reaction of 2,4-hexadiene and 2 moles of chlorine.

**Alkyne Additions** (1 Question)

**Symmetrical**

1. What type of geometric isomer is seen in a normal symmetrical addition to produce an alkene?

2. How many steps are required to make an alkyne an alkene?

3. How many steps are required to make an alkyne an alkane?

4. Write an equation for 2-pentyne and 1 mole of Chlorine.

5. Write an equation for 2-pentyne and 2 moles of Chlorine.

**Hydrogenation**

1. What type of geometric isomer is seen in a hydrogenation of an alkyne to produce an alkene?

2. Write an equation for the hydrogenation of 2-pentyne using Lindlar’s catalyst.

3. Write an equation for the hydrogenation of 2-pentyne using Ni, Pd, and Pt as catalysts.

**Unsymmetrical**

1. Write an equation for 2-pentyne and 1 mole of HCl.

2. Write an equation for 2-pentyne and 2 moles of HCl.

**Free Radical Polymerization Additions** (1 Question)

1. What are the three steps of free radical polymerization?

2. What makes this free radical process different from other radical driven reactions we have already examined?

3. Show me the polymerization steps for C-C-O-O-C-C and ethene.