

Reactions Involving Hydrocarbons

Combustion of Hydrocarbons

- * All hydrocarbons burn with oxygen to form large amounts of heat and light



- * (not balanced! Balance it!)

Combustion

Complete Combustion: Enough oxygen to carry out combustion



Combustion

Complete Combustion: Enough oxygen to carry out combustion



Incomplete Combustion: Not enough oxygen to carry out combustion



Example

- * Example: write a balanced chemical equation to represent the complete combustion of hex-1-ene. Use a condensed structural formula to represent hex-1-ene.
- * Step 1: write the word equation
- * hex-1-ene + oxygen \longrightarrow carbon dioxide + water

Example

* Step 2: write the chemical equation, using a condensed structural formula for hex-1-ene



Example

* Step 3: Balance the chemical equation:



Addition Reactions

- * Occurs with alkenes and alkynes
- * Double and triple bonds can be converted to single bonds
- * Can add hydrogen, halogens, or small groups (like -OH) to the carbon atoms

Example

* Example: Draw a structural formula equation for the following addition reaction:



Example

* ethene + hydrogen \longrightarrow ethane

Example

- * Example: Draw a structural formula equation for the following addition reaction:
 - * but-2-ene and hydrogen chloride

Example

Substitution Reactions

- * Occur when an alkane and a halogen react under UV light.
- * Not an addition reaction (where there are 2 reactants and 1 product)
- * 2 reactants and 2 products in substitution reactions

Example

- * Example: Draw structural formulas to show the substitution reaction of methane and bromine

Example