**Naming & Drawing Hydrocarbons**

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| --- | --- | --- |
| **YOYO**: Answer the following questions. | | |
| Which compound is a saturated hydrocarbon?   1. CH2CH2 2. CH3CH3 3. CH3CHO 4. CH3CH2OH | Which represents an unsaturated hydrocarbon?   1. C2H4 2. C3H8 3. C4H10 4. C5H12 | Which general formula represents the compound CH3CH2CCH   1. CnHn 2. CnH2n 3. CnH2n-2 4. CnH2n+2 |

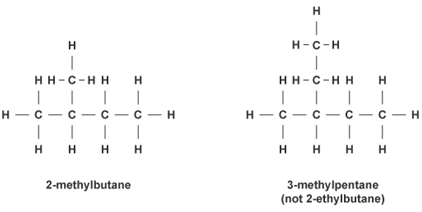
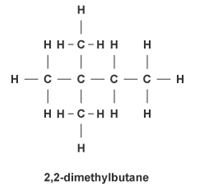
Straight Chain Alkanes

* Also referred to as n-alkanes (“normal” alkanes); example = n-hexane
* General Rule for Naming Straight Chain Alkanes 🡪 use prefix (Table P) to tell you how many carbon atoms you have then add the suffix “-ane”

|  |  |
| --- | --- |
| **Name:** Pentane  **Chemical Formula:**  **Structural Formula:** | **Name**: Butane  **Chemical Formula:**  **Structural Formula:** |

Branched Alkanes

* Branched = not a straight continuous chain; organic molecule that has smaller branches coming off a longer continuous chain
* \*How can you tell if it’s “branched”? You can’t run your finger along all the carbons in one “sweep” (you hit dead-ends and have to turn around and retrace part/some of your path); because of this we must establish a “parent chain” or main backbone in order to name the molecule



Methyl and Ethyl Groups

* Methyl and ethyl groups are common branches on organic compounds

|  |  |
| --- | --- |
| Methyl Group | Ethyl Group |

Naming Branched Alkanes

1. Locate the **longest possible carbon chain** (parent chain) in molecule. Any carbons coming off this chain are the **branches. Number the carbons** in the parent chain so that the branch(es) fall at the **lowest possible number/sum**
2. Name the **branches first** (separately, in alphabetical order as per their prefix) along with **the # of the C they are on.**
   1. **Prefix based on the # C’s (table P) + suffix –yl**
3. Branches are named separately unless there are two of the same. If this is the case, lump them into the same branch name (w/ number locations) & add appropriate **prefix** (di, tri, tetra, etc.) depending on how many C’s in branch.
4. The **parent chain** is **stated last** in the name (the # carbons in parent chain should agree with the prefix in the last word of the chemical name).

|  |  |
| --- | --- |
| **Name:**  **Structural Formula:** | **Name:**  **Structural Formula:** |
| **Name:**    **Structural Formula:** | **Name:** 4-ethyl heptane  **Structural Formula:** |
| **Name:** 2-methyl butane  **Structural Formula:** | **Name:** 2-methyl pentane  **Structural Formula:** |

Straight Chain Alkenes

* Number the lowest # carbon where the double bond is located, then add the suffix “-ene” to the name (prefix should refer to the number of C’s)

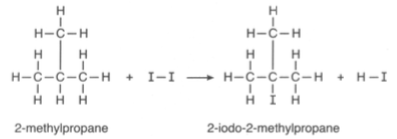
|  |  |
| --- | --- |
| **Name:**  **Structural Formula:** | **Name:**  http://upload.wikimedia.org/wikipedia/commons/thumb/2/22/Propene-2D-flat.png/808px-Propene-2D-flat.png  **Structural Formula:** |
| http://www.kentchemistry.com/links/organic/molecules/2-pentene.gif  **Name:** 3-hexene  **Structural Formula:** | **Name:** 4-decene  **Structural Formula:** |

Straight Chain Alkynes

* State the lowest carbon # where the triple bond is located then add the suffix “-yne”

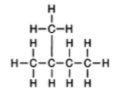
|  |  |
| --- | --- |
| **Name:**  **Structural Formula:**  http://faculty.ccbcmd.edu/courses/chem100e/nchem100/lectures/ch5pb3c.jpg | **Name:**  http://upload.wikimedia.org/wikipedia/commons/thumb/a/af/Ethylacetylene.svg/180px-Ethylacetylene.svg.png  **Structural Formula:** |
| **Name:** 2-pentyne  **Structural Formula:** | **Name:** 3-heptyne  **Structural Formula:** |

Practice Regents Short Answer Questions



1. Base your answer to the following question on the information below

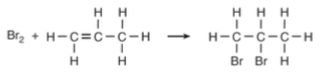
The hydrocarbon 2-methylpropane reacts with iodine as represented by the balanced equation below. At standard pressure, the boiling point of 2-methylpropane is lower than the boiling point of 2-iodo-2-methylpropane. **Explain, in terms of bonding, why the hydrocarbon 2-methylpropane is saturated.**



1. Base your answer to the following question on the information below.

The formula below represents a hydrocarbon.

**Explain, in terms of carbon-carbon bonds, why this hydrocarbon is saturated.**



1. Base your answer to the following question on the information below.  
   A reaction between bromine and a hydrocarbon is represented by the balanced equation below.

**Write the name of the homologous series to which the hydrocarbon belongs.**

1. Base your answer to the following question on the information below.

Gasoline is a mixture composed primarily of hydrocarbons such as isooctane, which is also known as 2,2,4-trimethylpentane. Gasoline is assigned a number called an octane rating. Gasoline with an octane rating of 87 performs the same as a mixture that consists of 87% isooctane and 13% heptane.

An alternative fuel, E-85, can be used in some automobiles. This fuel is a mixture of 85% ethanol and 15% gasoline. I**n the space below, draw a structural formula for a molecule of 2,2,4-trimethylpentane.**