Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Building Alkanes, Alkenes and Alkynes**

Table P: Prefixes used in naming organic compounds:



Alkanes

* Atoms are only bonded by single bonds
* Name of each compound ends in -ane

Construct the following Alkenes listed in the table below. Connect the carbons in a chain-like fashion (one right after another.) Make sure all holes are filled with bonds.

|  |  |  |
| --- | --- | --- |
| Compound Name | Molecular Formula  CxHy | Structural Formula (Draw your molecule with symbols and lines) |
| Methane | CH4 | [http://upload.wikimedia.org/wikipedia/commons/c/c0/Methane-2D-square.png](http://www.google.com/url?sa=i&rct=j&q=methane+structure&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=http%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2FFile%3AMethane-2D-square.png&ei=lME3Vff9NI-jyQT4n4CwCw&psig=AFQjCNEYdcZ0OuqiuTnwSALHpW4sqkP9oA&ust=1429803795997079) |
| Ethane |  |  |
| Propane |  |  |
| Butane |  |  |
| Pentane |  |  |
| Hexane |  |  |

**Questions:**

1. What is the relationship between the # of carbon atoms and hydrogen atoms in an alkane molecule?  
  
  
2. Some hydrocarbons can have the same number of carbon and hydrogen atoms but can be connected differently (different structural formulas.) These are known as isomers. Revisit the molecules butane and pentane. Construct an isomer of each of the molecules and record them below.

**Isomer of butane Isomer of pentane**

3. How do you think we distinguish isomers molecules from each other?

Alkenes

* Have one double bond between 2 of the carbon atoms in the molecule.
* The name of each compound ends in –ene.

Construct the following Alkenes listed in the table below. Connect the carbons in a chain-like fashion (one right after another.) Make sure all holes are filled with bonds.

|  |  |  |
| --- | --- | --- |
| Compound Name | Molecular Formula  CxHy | Structural Formula (Draw your molecule with symbols and lines) |
| Ethene |  |  |
| Propene |  |  |
| Butene |  |  |
| Pentene |  |  |
| Hexene |  |  |

**Questions:**

1. What is the relationship between the # of carbon atoms and hydrogen atoms in an alkene molecule?  
  
  
2. Why can’t you construct a methene molecule?

3. Is there more than one place you could have put the double bond in propene?   
 What about butene? If so where?

Alkynes

* Have one triple bond between 2 of the carbon atoms in the molecule.
* The name of each compound ends in –yne.

Construct the following Alkynes listed in the table below. Connect the carbons in a chain-like fashion (one right after another.) Make sure all holes are filled with bonds.

|  |  |  |
| --- | --- | --- |
| Compound Name | Molecular Formula  CxHy | Structural Formula (Draw your molecule with symbols and lines) |
| Ethyne |  |  |
| Propyne |  |  |
| Butyne |  |  |
| Pentyne |  |  |
| Hexyne |  |  |

Questions:

1. What is the relationship between the # of carbon atoms and hydrogen atoms in an alkyne molecule?  
  
  
2. Why can’t you construct a methyne molecule?

3. Is there more than one place you could have put the triple bond in propyne?   
 What about butyne? If so where?