**Molecular modeling lab Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_date\_\_\_\_\_\_\_per\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Methane**  Molecular Formula:  Structural Formula: Sketch of the model:  Geometry at the Carbon: | **Ethane**  Molecular Formula:  Full Structural Formula: Sketch of the model:  Rotation around the C-C bond? Yes No | |
| **Butane**  Molecular Formula:  Structural Formula: Sketch of the model: | **Hexane**  Molecular Formula:  Structural Formula: Sketch of the model: | |
| **Propene**  Molecular Formula:  Full Structural Formula: Sketch of the model:  Rotation around the C=C bond? Yes No | **2-pentene**  Molecular Formula:  Structural Formula: Sketch of the model: | |
| **3-methylhexane**  Molecular Formula:  Structural Formula: Sketch of the model:  Geometry at C3 : | **Propanal**  Molecular Formula:  Structural Formula: Sketch of the model:  Rotation around the C=O bond? Yes No | |
| **But-2-one**  Molecular Formula:  Structural Formula: Sketch of the model:  Geometry at C3 : | **Pentanoic acid**  Molecular Formula:  Structural Formula: Sketch of the model:  Geometry at C1 : | |
| **2,3-dichlorohexane**  Molecular Formula:  Structural Formula: Sketch of the model: | **4-chlorobut-1-ene**  Molecular Formula:  Structural Formula: Sketch of the model: | |
| **4 Structural isomers of C6H14** | | |
| Molecular Formula:  Condensed Structural Formula:  Structural Formula: Sketch of the model: | | Molecular Formula:  Condensed Structural Formula:  Structural Formula: Sketch of the model: |
| Molecular Formula:  Structural Formula: Sketch of the model: | | Molecular Formula:  Structural Formula: Sketch of the model: |
| **4 Structural Isomers of C6H12** | | |
| Name:  Structural Formula: Sketch of the model: | | Name:  Structural Formula: Sketch of the model: |
| Name:  Structural Formula: Sketch of the model: | | Name:  Structural Formula: Sketch of the model: |
| **2 Structural Isomers of C2H4O** | | |
| Name:  Structural Formula: Sketch of the model: | | Name:  Structural Formula: Sketch of the model: |

Questions:

1. Which compounds in this assignment are members of the same homologous series?
2. Can you generalize the shape/geometry around a carbon involved in a:
   1. Single Bond b. Double Bond
3. Is a molecule more or less restricted in its movement when it contains a double bond? Explain

**Molecular Modeling Project**

**Investigating homologous series and isomers**

**25pts - Due after Spring Break (3/30-3/31)**

**Part 1:**

Create a poster (8.5x11) showing five members of a homologous series. The molecules you choose must include one of the following functional groups: haloalkane, aldehyde, ketone, alcohol, or carboxylic acid.

[5pts]

Functional Group in my homologous series:

**On your poster you must include the following:**

* Name of each compound
* Molecular formula of each compound
* Structural formula of each compound
* The trend in boiling/melting point for the series

**Part 2:**

Choose one member of the homologous series you worked with in part 1 and identify four isomers of the molecule. Construct a three-dimensional model (with correct bond angles and different atoms/bonds clearly identifiable) for all four isomers (using materials of your choice – it would be nice to be able to hang them from the ceiling). [20pts]

**“Parent” Molecule from my homologous series – Molecular Formula:**

**Structural Formula:**

|  |  |
| --- | --- |
| **4 Structural Isomers** | |
| Name:  Structural Formula: Sketch of the model: | Name:  Structural Formula: Sketch of the model: |
| Name:  Structural Formula: Sketch of the model: | Name:  Structural Formula: Sketch of the model: |