Science 10 – Chapter 5.3 – Organic Compounds Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_

**Organic vs. Inorganic Compounds -** Another way of classifying chemical compounds…

* Every compound in the world is classified as either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Did you know that well over \_\_\_\_\_\_\_\_ of all known compounds on earth are Organic compounds??

**Organic Compounds**

* Organic compounds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (and usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
	+ Sometimes other types of atoms near carbon on the periodic table are also attached, especially: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, sulfur, phosphorus and the halogens

**Organics vs Acids**

* Organic molecules always have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CH4 HC4

* This differentiates organic compounds from acids, which almost always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. 🡪 HCl

Is that why foods are called “organic”?

* + Organic actually derives from “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”, because the compounds that plants and animals make are all C-compounds
	+ This is not the meaning of organic foods though!
		- * In this case *organic foods* refer to being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ironically many of these chemicals are actually ORGANIC compounds!)

**Inorganic Compounds**

* Inorganic compounds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_… with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Compounds containing cyanide (\_\_\_\_\_\_\_\_\_\_\_\_) and carbonate (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) ions
	+ Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Why are Organic Compounds So Special?**

* + Carbon has\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which allows for \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than any other element.
		- Long chains of carbons form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (circular), \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between carbons

 There are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Types of Organic compounds. We only talk about two.

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Hydrocarbons**

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an organic compound that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_.

*Hydrocarbons are based on a carbon “backbone”, or chain, with hydrogen atoms added on the sides*

* You know about hydrocarbons already! The simplest hydrocarbons are ones that you might recognize

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (CH4)--- main component of natural gas

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C2H6)--- also found in natural gas

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C3H8) --- used as a fuel for BBQs

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C4H10) --- an extremely flammable fluid used in industrial torches

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C8H18)---a combustible liquid in gasoline

* All hydrocarbons are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and most are liquids at room temperature

**Alcohols**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are organic compounds with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The simplest alcohols are:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (CH4O)--- used in labs as a **solvent** (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C2H6O)---is a psychoactive drug (present in alcohol), but is now being considered as a fuel source

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (C3H8O)---rubbing alcohol used to sterilize cuts

* Alcohols are generally very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Some different representations:**

1. Structural formula- lists the elements and their proportions in the order they are bonded

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Ball-and-stick model- each element is given a different colour and/or size and the picture shows how many and how the elements are bonded

*Each black ball represents C…*

*Each white ball represents H…*

*The red ball represents O…*

 This is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Space-filling model- similar to a ball-and-stick model, but the balls are proportional to the sizes of the atoms.

This is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The First Five Hydrocarbons Name \_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Molecular Formula | Structural Formula | Shortened Structural Formula | Space Filling Model | Common Uses |
| methane |  |  |  |  |  |
|  |  |  | CH3CH3 |  | Manufacturing plastic |
|  | C3H8 |  |  |  | Camp fuel |
|  |  |  | CH3CH2CH2CH3 |  | Hand held lighters |
| pentane |  |  |  |  |  |
| Can you guess the names of the next 5 hydrocarbons?  |
| **The First Five Alcohols** |
| methanol |  |  |  |  |  |
|  | C2H6O |  |  |  |  |
|  |  |  | CH3CH3CH2OH |  |  |
| butanol |  |  |  |  |  |
|  | C5H12O |  |  |  |  |