

CH 4 - Carbon and Functional Groups



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

The electron architecture of Carbon makes it ideally suited as the element around which \_\_\_\_\_ is organized.

What is the universal medium for life?

Carbon makes up the **b\_\_\_\_\_e** of all organic molecules. No exceptions.

Compounds that contain carbon are called \_\_\_\_\_ compounds.

The scientist pictured to the right is Dr. S\_\_\_\_\_ M\_\_\_\_\_.

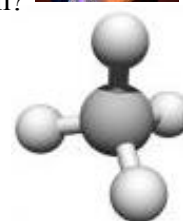


Most organic compounds are produced by \_\_\_\_\_, although chemical companies such as Dow and Upjohn are also successful in synthesizing organic molecules.

How many valence electrons does Carbon possess?

How many covalent bonds does Carbon have the potential to form?

The image to the right teaches us that carbon's bonds tend to branch off in four directions and form a(n) \_\_\_\_\_.



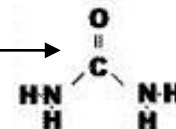
When carbon forms *double* bonds, the molecule is restricted to \_\_\_\_\_ (#) plane(s).

What is  $O=C=O$ ?

Is it chemically *reactive* or *stable*?

The initial source of carbon for all organic molecules is the gas \_\_\_\_\_.

What molecule is pictured to the right? \_\_\_\_\_



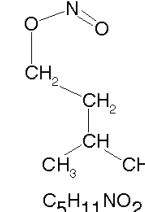
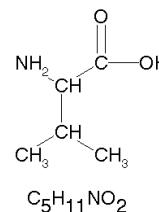
Does carbon usually form a *single*, *double*, or *triple* bond when bonded to hydrogen?

An organic molecule consisting of only hydrogen and carbon is called a(n) \_\_\_\_\_.

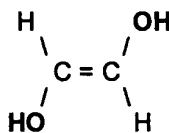
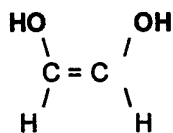
A. \_\_\_\_\_  
 B. \_\_\_\_\_

A. Are hydrocarbons *non-polar* or *polar*? B. *Hydrophilic* or *hydrophobic*?

The two molecules pictured to the right are \_\_\_\_\_ isomers.



The two molecules pictured below are \_\_\_\_\_ isomers.



\_\_\_\_\_

The two molecules pictured to the right are \_\_\_\_\_.



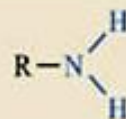
## Functional Groups

- \_\_\_\_\_ Do functional groups behave in the same way when they are attached to different organic molecules?
- \_\_\_\_\_ Are functional groups usually polar or non-polar?
- \_\_\_\_\_ Addition of a functional group (*increases / decreases*) solubility.

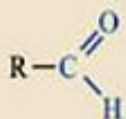
## Matching

1. \_\_\_\_\_ Hydroxyl group
2. \_\_\_\_\_ Amino group
3. \_\_\_\_\_ Carbonyl group
4. \_\_\_\_\_ Carboxyl group
5. \_\_\_\_\_ Sulfhydryl group
6. \_\_\_\_\_ Phosphate group
7. \_\_\_\_\_ Added and removed during ATP synthesis and decomposition.
8. \_\_\_\_\_ When added, the organic molecule becomes an alcohol.
9. \_\_\_\_\_ Sugars are soluble due to the presence of this group.
10. \_\_\_\_\_ Involved in energy transfer between organic molecules.
11. \_\_\_\_\_ Create organic acids
12. \_\_\_\_\_ Added to carbon (along with a carboxyl group) to make protein building blocks.
13. \_\_\_\_\_ Separates nucleotides in DNA.
14. \_\_\_\_\_ Acts as a base.
15. \_\_\_\_\_ Stabilizes the shape of proteins.
16. \_\_\_\_\_ Forms aldehydes and ketones.
17. \_\_\_\_\_ added to DNA affects gene expression

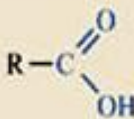
A.



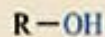
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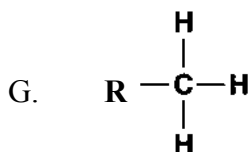
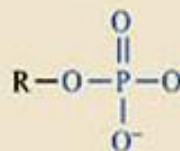
C.



D.



E.



F.

