



3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj



WORKSHEET 16

School: **Ba Sangam College**

Year: **12**

Subject: **Chemistry**

Name: _____

Strand	4 Materials
Sub strand	12.4.1 Inorganic Chemistry
Content Learning Outcome	12.4.1.3 Investigate the different classes and reactions of hydrocarbons.

Alkynes

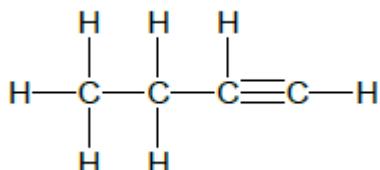
- Alkynes are unsaturated hydrocarbons that contain one or more carbon-carbon triple bond.
- The general formula of this group of organic compounds is C_nH_{2n-2} .

IUPAC Rules for Alkyne Nomenclature

1. The rules for naming alkynes are the same as that for naming alkenes, with some exceptions.
2. The “yne” suffix indicates an alkyne. Wherever necessary, a number is written in front of “yne” to indicate the position of the carbon to carbon triple bond.
3. The longest chain chosen for the parent name must include both carbon atoms of the triple bond.
4. The parent chain must be numbered from the end nearest a triple bond carbon atom.
5. If the triple bond is in the center of the chain, the nearest substituent rule is used to determine the end where numbering starts.
6. The smaller of the two numbers designating the carbon atoms of the triple bond is used as the triple bond locator.

Example 1

Name the alkyne shown below.

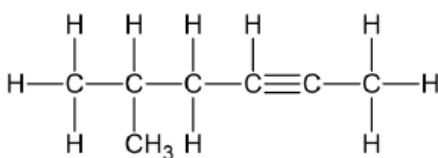


Solution

- The longest chain contains 4 carbon atoms. Thus parent name is butyne. There is no side branch in this alkyne.
- The triple bond falls on carbon number 1. Therefore the name of the alkyne is **but-1-yne** or **1-butyne**.

Example 2

Name the organic compound shown below.



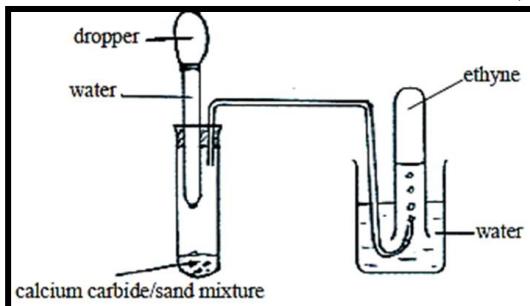
Solution

The compound is an alkyne since it contains a carbon to carbon triple bond.

- The longest chain with the triple bond has 6 carbon atoms. Thus the parent name is hexyne.
- The triple bond falls on the second carbon atom. Thus, the parent name will be: hex-2-yne.
- The side branch has 1 carbon atom, thus will be named, methyl.
- The side branch falls on carbon number 5 (*counting from the side which gives the carbon with a triple bond a lower number*). Thus 5-methyl.
- Therefore the name of the above compound is: **5-methylhex-2-yne**.

Laboratory preparation of ethyne gas

Ethyne gas can be prepared by the reaction of water with calcium carbide (CaC_2). Ethyne is a colorless gas.



Chemical reactions of alkenes and alkynes

- These groups of organic compounds are more reactive than alkanes.
- The most characteristic reaction of alkenes and alkynes is **addition** to the carbon carbon double bond or carbon to carbon triple bond.
- The double bond is broken and in its place single bonds form to two new atoms or groups of atoms.
- The triple bond is broken and in its place single bonds form to four new atoms or groups of atoms.
- There are four important addition reactions:
 1. Addition of hydrogen (**Hydrogenation or Reduction**).
 2. Addition of hydrogen halides (**Hydrohalogenation**).
 3. Addition of water (**Hydration**).
 4. Addition of bromine and chlorine (**Halogenation**).

Activity

1. Draw the structures of the following

a. but1-yne

b. 3 methyl but-2-yne

c. ethyne

d. pent2-yne

e. 2 ethyl but 3 yne

(10 marks)