Welcome to our module on Aliphatic Hydrocarbons: a precursor to organic polymers

Learning Outcomes:

At the end of the module, you should be able to:

1. write the molecular formulas of saturated and unsaturated hydrocarbons (alkanes, alkenes and alkynes) and cyclic alkanes;
2. name various saturated and unsaturated hydrocarbons (alkanes, alkenes and alkynes) and cyclic alkanes;
3. classify hydrocarbons and determine what type it is;
4. explain the common types of polymers and their uses;

In this module, you are recommended to have:

- Desktop, laptop or mobile phone to view this file; and
- Steady internet access to participate in our online class discussion through Google Meet (this will be streamed through Facebook Live so you'll be able to watch it for future reference).

You are also expected to:

- Read the entire module as it may help you to answer several self-assessments, activities or quizzes at the end of this lesson.
- Accomplish the self-assessments on your own. It is designed to gauge your understanding of the lesson and it will not be recorded. If you have any clarifications, you may contact me through our Google Classroom.

Content:

Rules of the IUPAC System for Naming Alkanes (Brown, W. and Poon, T., 2005)

Rule 1: For an unbranched-chain of carbon atoms, write the prefix equivalent to the numer of carbon atoms in the chain and add -ane.

Rule 2: For branched alkanes, identify the longest chain of carbon atoms aka the parent chain and its name becomes the root name.

Rule 3: Name and number the substituents. The number should correspond to the carbon atom o the parent chain to which the substituent is bonded.

Rule 4: If there is one substituent, number the parent chain from the end that gives it the lower number.

Rule 5: If there are two or more identical substituents, number the parent chain from the enc that gives the lower number to the substituent encountered first.

Rule 6: If there are two or more different substituents, list them in alphabetical order and number the chain from the end that gives the lower number to the substituent encountered first. The prefixes are not included in alphabetizing.

Prefixes Used to SHow the Presence of Carbon (Brown, W. and Poon, T., 2005)

Prefix	Number of Carbon Atoms	Prefix	Number of Carbon Atoms	Prefix	Number of Carbon Atoms
meth	1	oct	8	pentadec	15
eth	2	non	9	hexadec	16
prop	3	dec	10	heptadec	17
but	4	undec	11	octadec	18
pent	5	dodec	12	nonadec	19
hex	6	tridec	13	eicos	20
hept	7	tetradec	14		

Names of Most Common Alkyl Groups (Brown, W. and Poon, T., 2005)			
Name	**Condensed Structural Formula**	**Name**	**Condensed Structural Formula**
methyl	$-CH_3$	butyl	$-CH_2CH_2CH_2CH_3$
ethyl	$-CH_2CH_3$	isobutyl	$-CH_3CHCH_3$ | CH_3
propyl	$-CH_2CH_2CH_3$	sec-butyl	$-CHCH_3CH_3$ | CH_3
iropropyl	$-CHCH_3$ | CH_3	iso-butyl	CH_3 | $-CCH_3$ | CH_3

Naming of Cyclic Alkanes (Garcia, G., 2016)

Rule 1: The ring will be the parent chain and named by the number of carnons but with the prefix cyclo.

Rule 2: Number the ring starting from the carbon with the substituemt lowest in the alphabet. Number in the direction that gives the lower overall substituent numbers. In more complex situations go in the direction that is alphabetical.

Rule 3: Name any substituent attached to the parent chain. Group repeated substituents together using prefixes. List them in alphabetical oorder ignoring the prefixes.

References:

Brown, W. & Poon, T. (2005). Introduction to Organic Chemistry 3rd edition. John Wiley & Sons, Inc.

Garcia, G. (2016). General Chemistry 1. Unlimited Books Library Services & Publishing In..