

Name: _____

Blk: _____ Date: _____

Chemistry 11
Organic Chemistry
Lesson #2 NAMING BRANCHED HYDROCARBONS

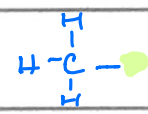
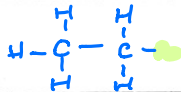
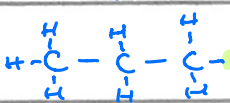
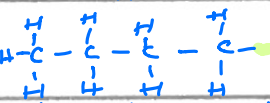
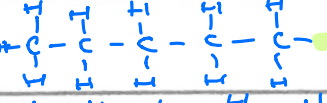
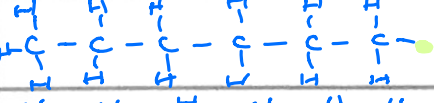
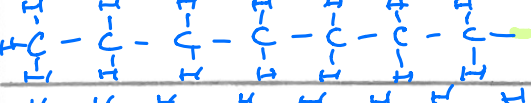
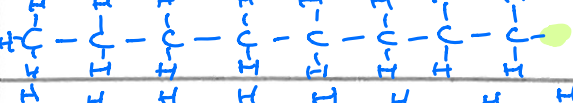

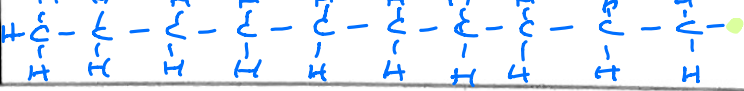
In order to name a single chained hydrocarbon you have to understand that there can be attachments made to any carbon in an organic molecule,

It is these attachments that change the name of the structure. The first type of attached group that we are going to learn are called alkyl,

C_nH_{2n+1} C_nH_{2n+2}
An ALKYL is simply an ALKANE that has one less Hydrogen atom, This missing hydrogen frees up a BOND and allows it to attach itself to the organic molecule,

When naming an **ALKYL**, change the "ANE" ending of the alkane to "YL" ‡ condensed

Fill in the following table with the appropriate **expanded structures**

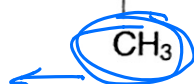
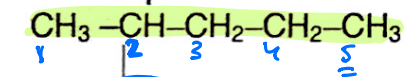
NAME	# of C	FORMULA
METHYL	1	 CH_3-
ETHYL	2	 CH_3-CH_2- OR $-CH_2-CH_3$
PROPYL	3	 $CH_3-CH_2-CH_2-$ OR $-CH_2-CH_2-CH_3$
BUTYL	4	 etc
PENTYL	5	
HEXYL	6	
HEPTYL	7	
OCTYL	8	
NONYL	9	
DECYL	10	

RULES FOR NAMING BRANCHED HYDROCARBONS:

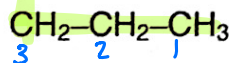
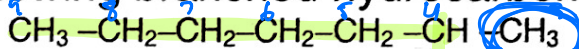
1. Start by counting the "longest continuous chain of carbons" → this is the "parent name"
2. Identify the location of the attached group by giving it the "lowest possible address"
3. To do so you can start at either end of the structure (right or left, top, bottom)
4. Place number for the attached group in front of that "alkyl" name
5. Separate the number from the alkyl name with a dash

IMPT: the atoms in the parent hydrocarbon are numbered to give the LOWEST POSSIBLE NUMBERS to the attached ALKYLs.

Example 1: Name the following branched hydrocarbons



← 2-methyl pentane

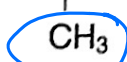
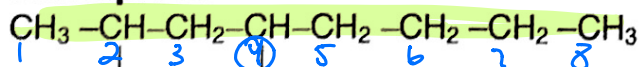


4-methyl nonane

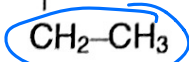
MORE RULES: When more than one attached alkyl is present

1. List the attached alkyl's alphabetically
2. Precede each alkyl with it's number location along the parent chain
3. Separate each attached alkyl with a dash

Example 2:



methyl



ethyl

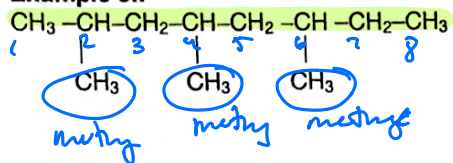
4-ethyl - 2-methyl octane

ANOTHER RULE: if the SAME alkyl group is repeatedly attached:

2-di 3-tri 4-tetra 5-penta
6-hexa 7-hept 8-octa 9-nona

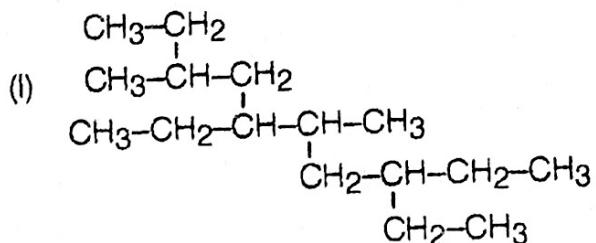
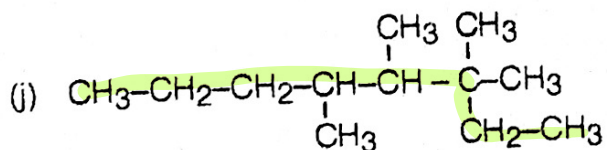
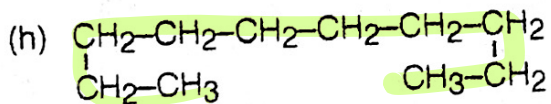
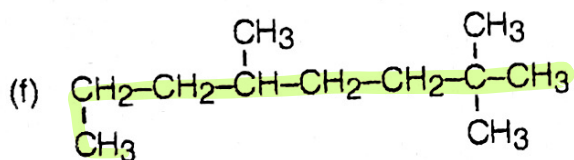
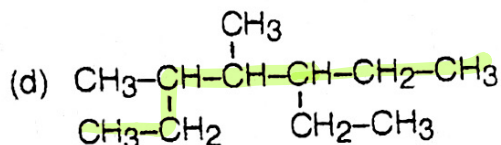
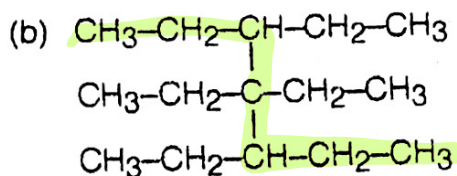
1. use the latin prefix in front of the alkyl name to indicate number of the SAME alkyl
2. identify the location on the parent chain of each alkyl separated by a comma

Example 3.:



2,4,6-trimethyl octane

HOMEWORK: QUESTIONS 8 and 9 page 221

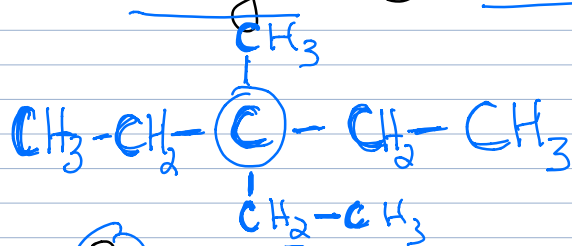


- (f) 5-butyl-6,6-diethyl-3,3,7-trimethyldecane
 (g) dimethylpropane (why were no numbers used?)
 (h) 4-ethyl-2-methyloctane
 (i) hexamethylpentane
 (j) 3,6-diethyl-4-methyl-5-propyloctane

How to draw a substituted alkane:

1. begin by drawing out the parent name
2. position the attached groups according to the name
3. Ensure that all atoms are "satisfied"

Ex: a. 3-ethyl - 3-methyl pentane:



b. 3 - methyl - 5-propyl octane:

