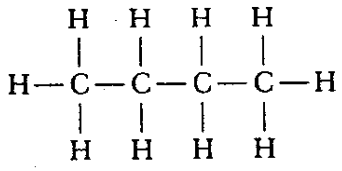
Naming Hydrocarbons

Hydrocarbons are compounds made up of carbon and hydrogen. Hydrocarbons called the alkanes are the simplest hydrocarbons. These compounds are named by using a prefix that tells the number of carbon atoms they contain and the root "ane."

Using the table below, name each of the alkanes that are shown.

Prefix	Number of Carbon Atoms
meth-	1
eth-	2
prop-	3
but-	4
pent-	5
hex-	6
hept-	7
oct-	8
non-	9
dec-	10



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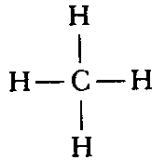

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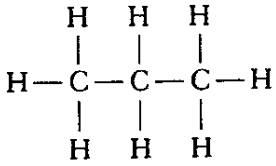

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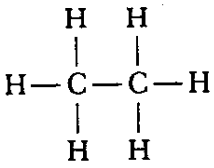

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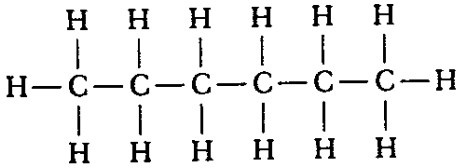

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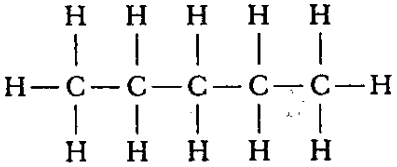

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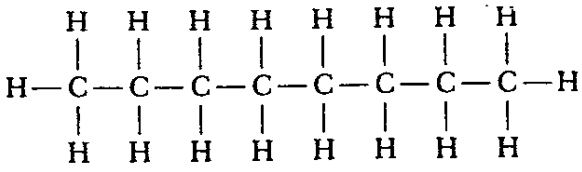


7. _____

Hydrocarbons: Compounds containing both hydrogen and carbon can be divided into 4 groups.

HYDROCARBONS

ALKANES	ALKENES	ALKYNES	BENZENE

How to name hydrocarbons:

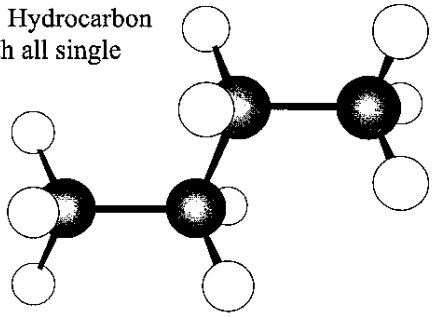
1. Count the longest carbon chain. Use chart P to find the prefix.
2. Look for the type of bond and use chart Q to add the suffix.
3. Is there any other chains that are attached or other elements on this chain? Count the carbons in the side chain and add yl to the end to name it.
4. Are there any halides attached. Count which number it is on and add it to the front and add chloro, fluro, bromo or iodo before the carbon chain.

Examples:

Chemistry: Form WS11.1.2A Name _____

ORGANIC CHEMISTRY Date _____ Period _____

Emphatically Aliphatic (the phattest molecules!)



Aliphatic hydrocarbons are hydrocarbon chains (as opposed to hydrocarbon rings). Hydrocarbon chains can have single, double, or triple bonds between carbons. Hydrocarbons with all single bonds have no bonds that can be broken to expose extra bonding sites where additional hydrogen atoms can be added. As a result they are called **saturated**. The family of saturated hydrocarbons is called **Alkanes**. Alkanes have the general formula C_nH_{2n+2} and are named with suffix "**ANE**". Octane (C_8H_{18}), the hydrocarbon found in gasoline, is an example. Unsaturated hydrocarbons have double or triple bonds. These bonds can be broken to add more hydrogens. The family of unsaturated hydrocarbons with one double bond is called **Alkenes**. Alkenes have the general formula C_nH_{2n} and are named with suffix "**ENE**". Octene (C_8H_{16}) is an example. **Alkynes** are the family of unsaturated hydrocarbons with one triple bond. They have the general formula C_nH_{2n-2} and are named with suffix "**YNE** as in octyne (C_8H_{14}).

For each of the formulas below, draw a diagram, indicate whether it is saturated or unsaturated, and state whether it is an ALKANE, ALKENE or ALKYNE. (Remember, no rings; emphatically aliphatic!)

1. C_5H_{10} _____
2. $C_{12}H_{22}$ _____
3. CH_4 _____
4. C_9H_{20} _____
5. C_6H_{10} _____
6. C_3H_6 _____
7. C_2H_6 _____
8. C_7H_{12} _____

Name _____ Date _____ Class _____

Structure of Hydrocarbons

Draw the structure of the compounds below.

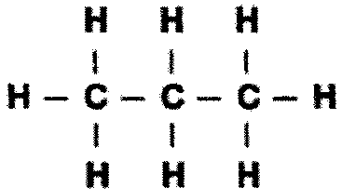
1. ethane	5. ethyne
2. propene	6. 3,3-dimethyl pentane
3. 2-butene	7. 2,3-dimethyl pentane
4. methane	8. n-butyne

Name _____ Date _____ Class _____

Naming Hydrocarbons

Name the compounds below according to the IUPAC naming system.

1.



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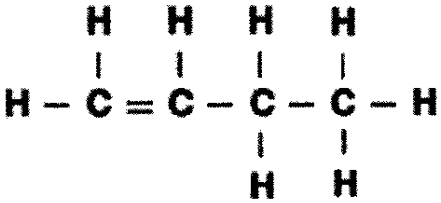

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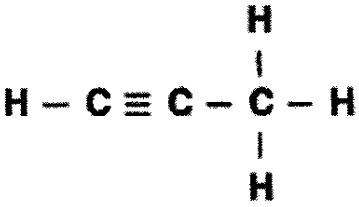

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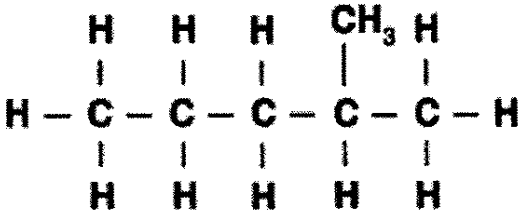

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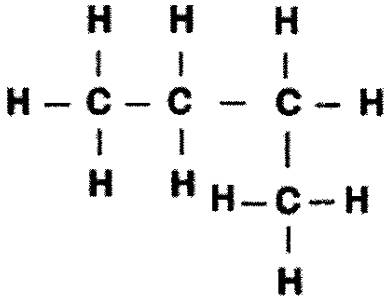

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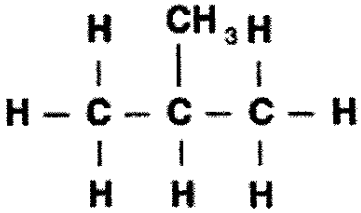

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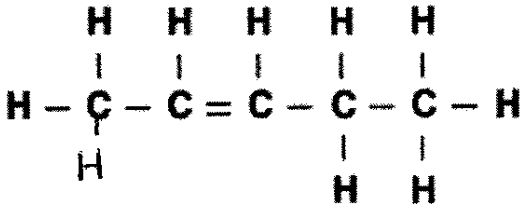

8.