Organic Chemistry

Mr. Skirbst

Organic Chemistry

"Organic" –

Organic Chemistry

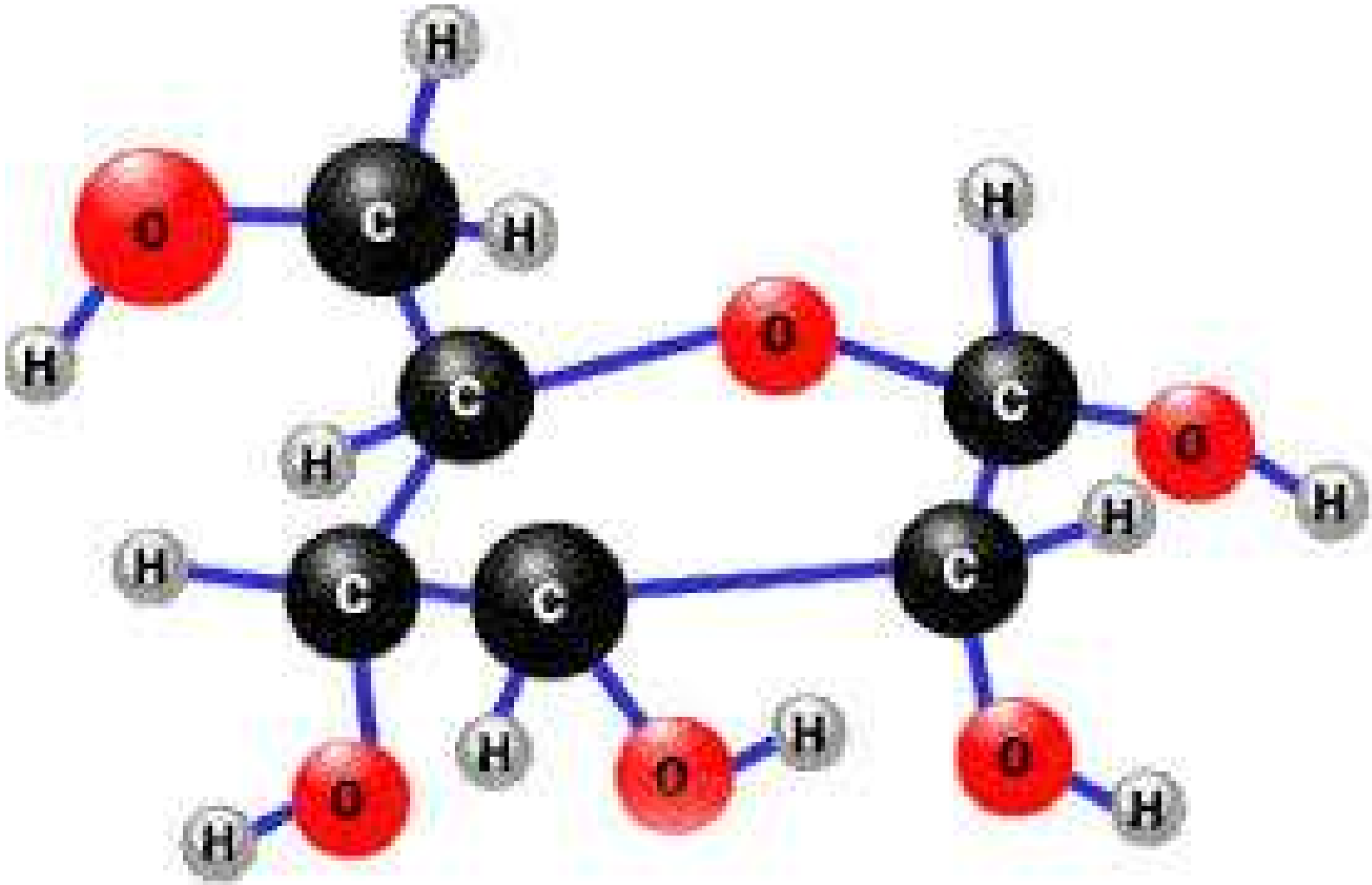
"Organic" – coming from life

Organic Chemistry

"Organic" – coming from life

"carbon-based" organisms

Organic Compounds

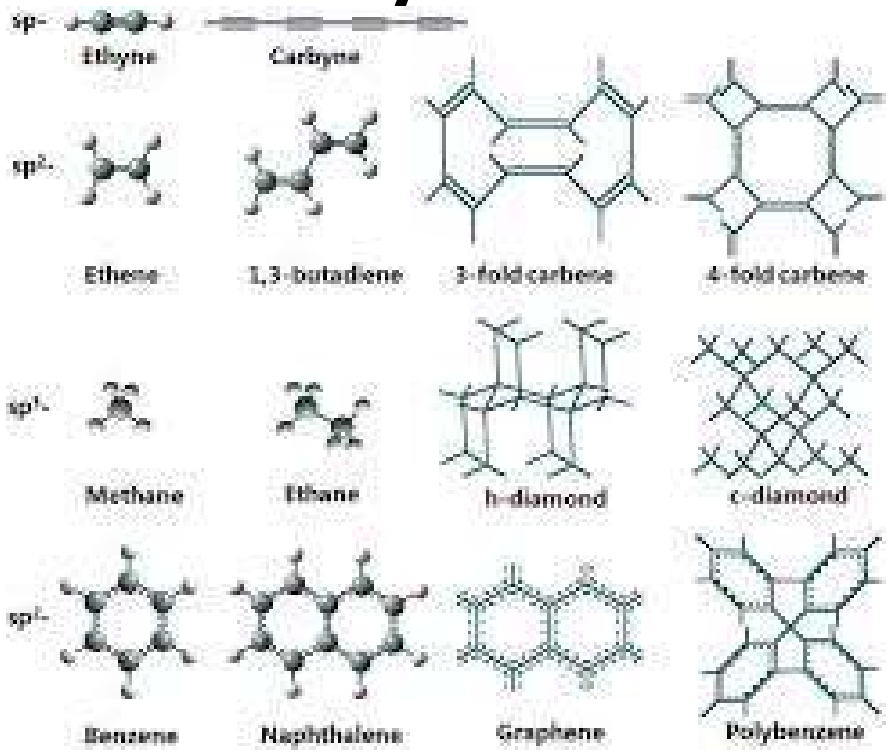


Organic Compounds

- Compounds containing Carbon

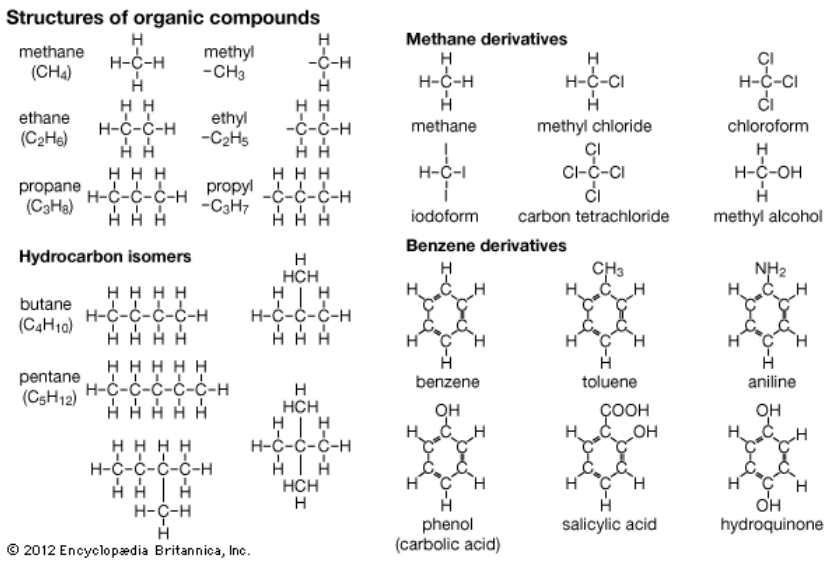
Organic Compounds

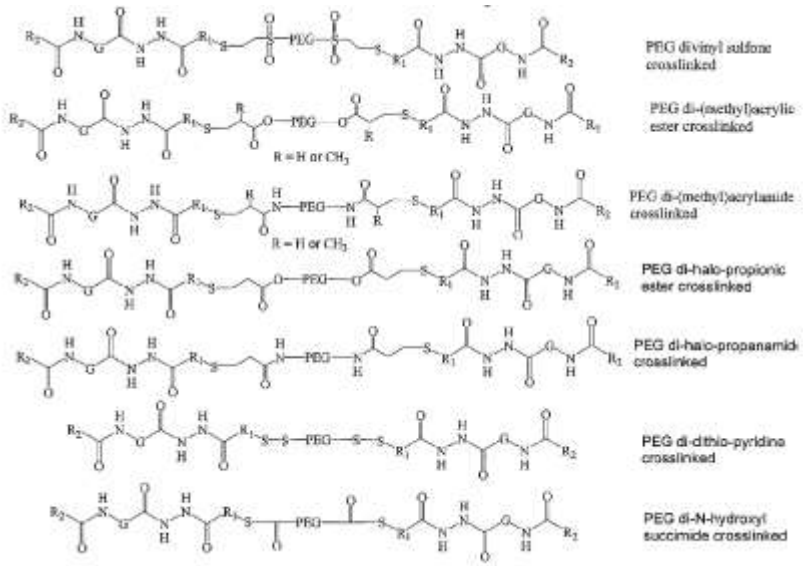
- Compounds containing Carbon
- Great diversity and variety



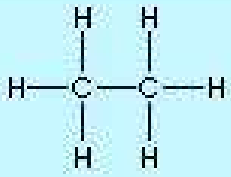
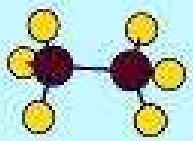
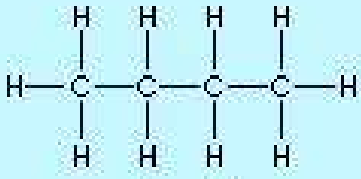
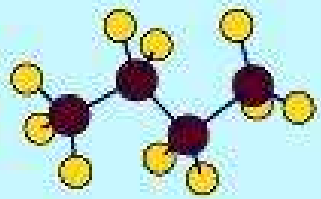
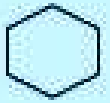
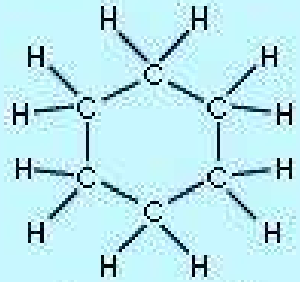
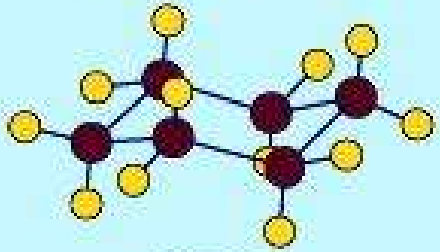
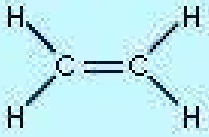
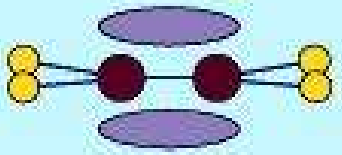
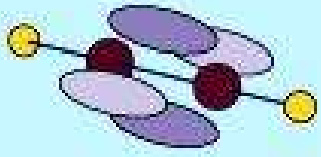
Organic Compounds

- Compounds containing Carbon
- Great diversity and variety
- Over 3 million compounds





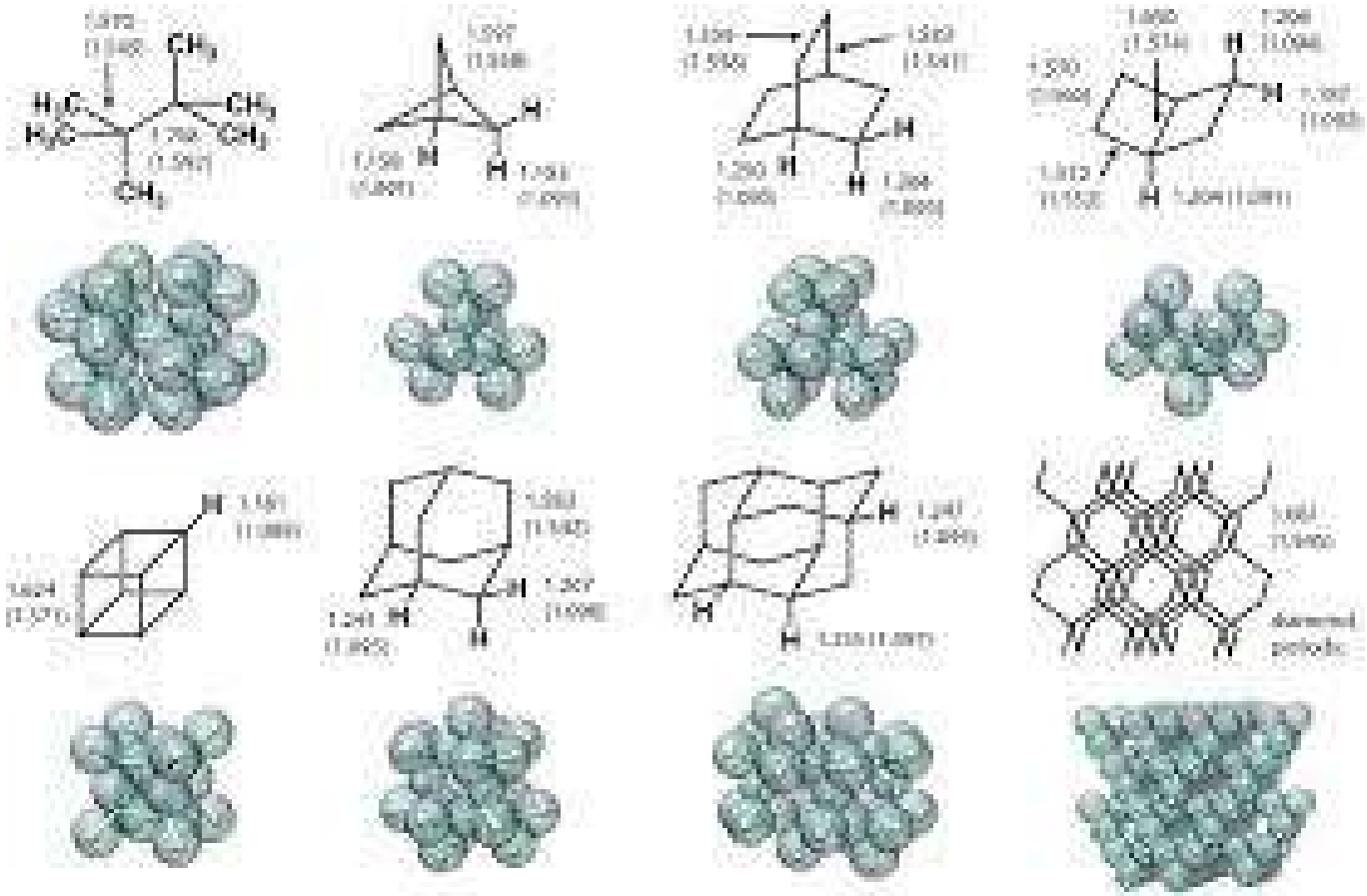
Carbon Bonding

	molecular formula	condensed structural formula	expanded structural formula	3-D structural formula
ethane	C_2H_6	CH_3CH_3		
butane	C_4H_{10}	$CH_3CH_2CH_2CH_3$		
cyclohexane	C_6H_{12}			
ethene	C_2H_4	$CH_2{=}CH_2$		
ethyne	C_2H_2	$HC{\equiv}CH$		

©1997 Encyclopaedia Britannica, Inc.

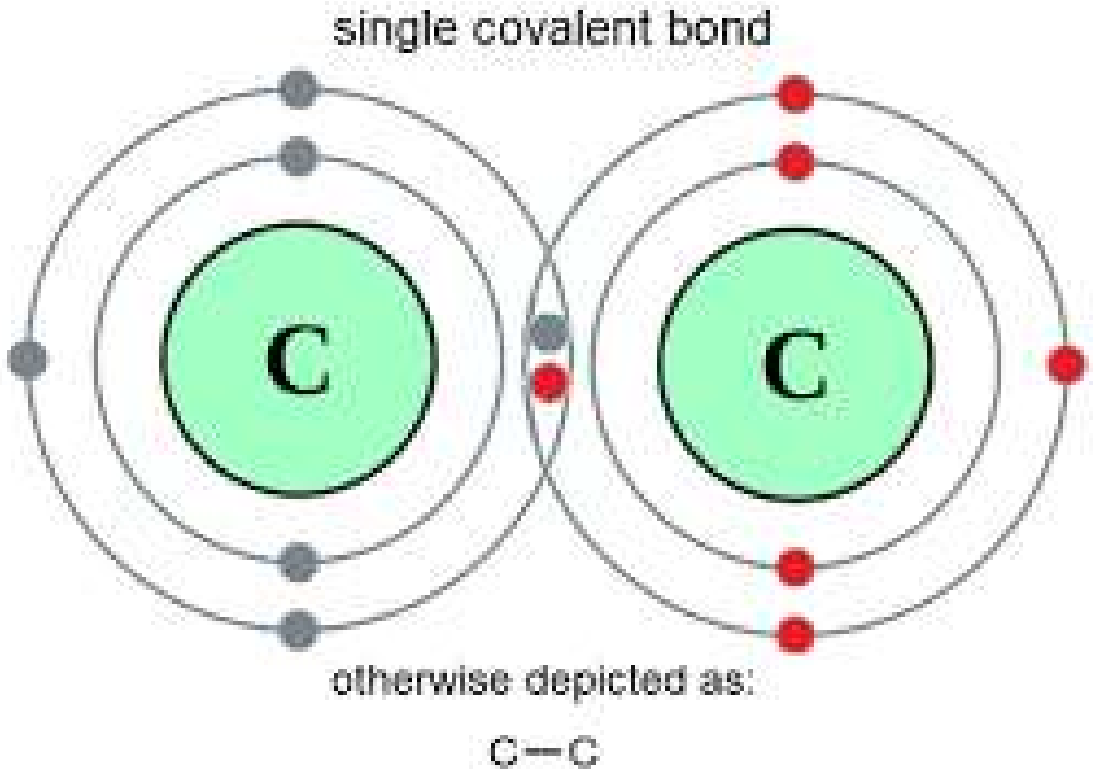
Carbon Bonding

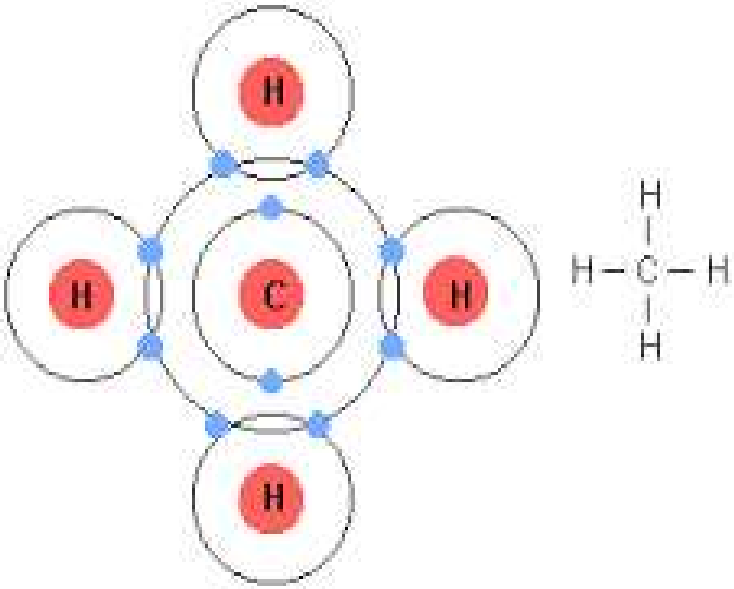
- Carbon bonds readily



Carbon Bonding

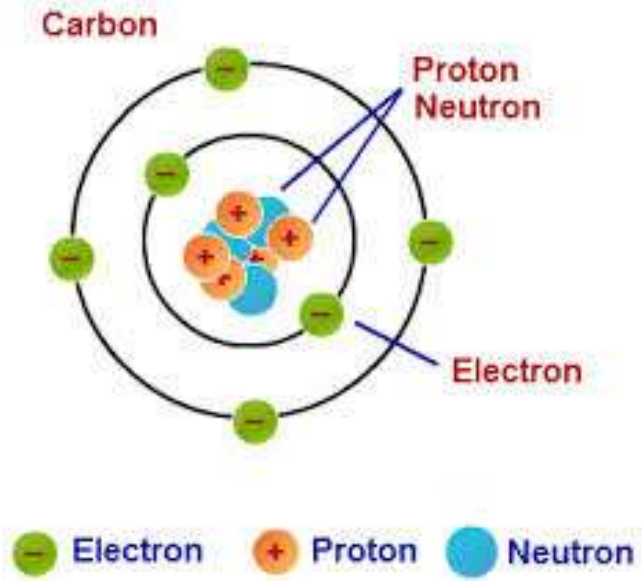
- Carbon bonds readily
- Forms covalent bonds





Carbon Bonding

- Carbon bonds readily
- Forms covalent bonds
- (4) valence electrons



Types of Carbon Bonds

[redacted] electron dot

Single

Double

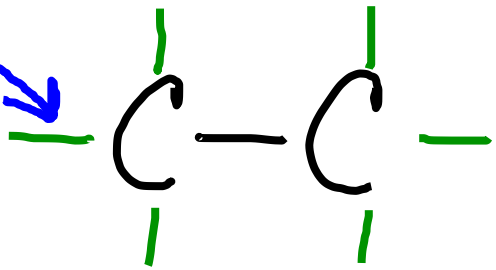
Triple

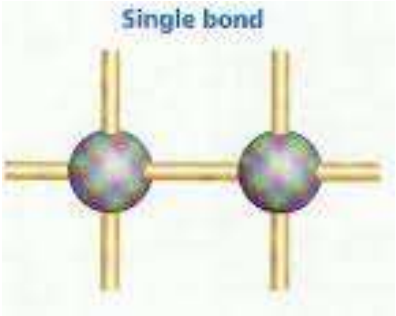
Types of Carbon Bonds

covalent bond

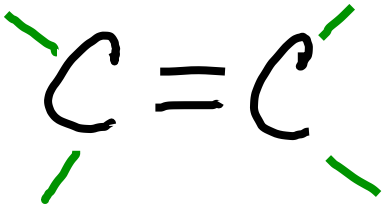
structural

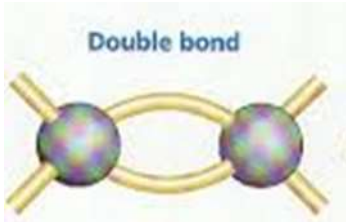
Single



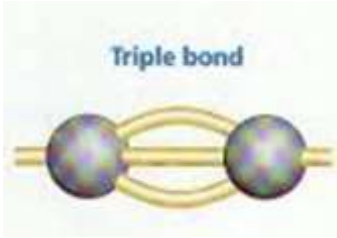


Double

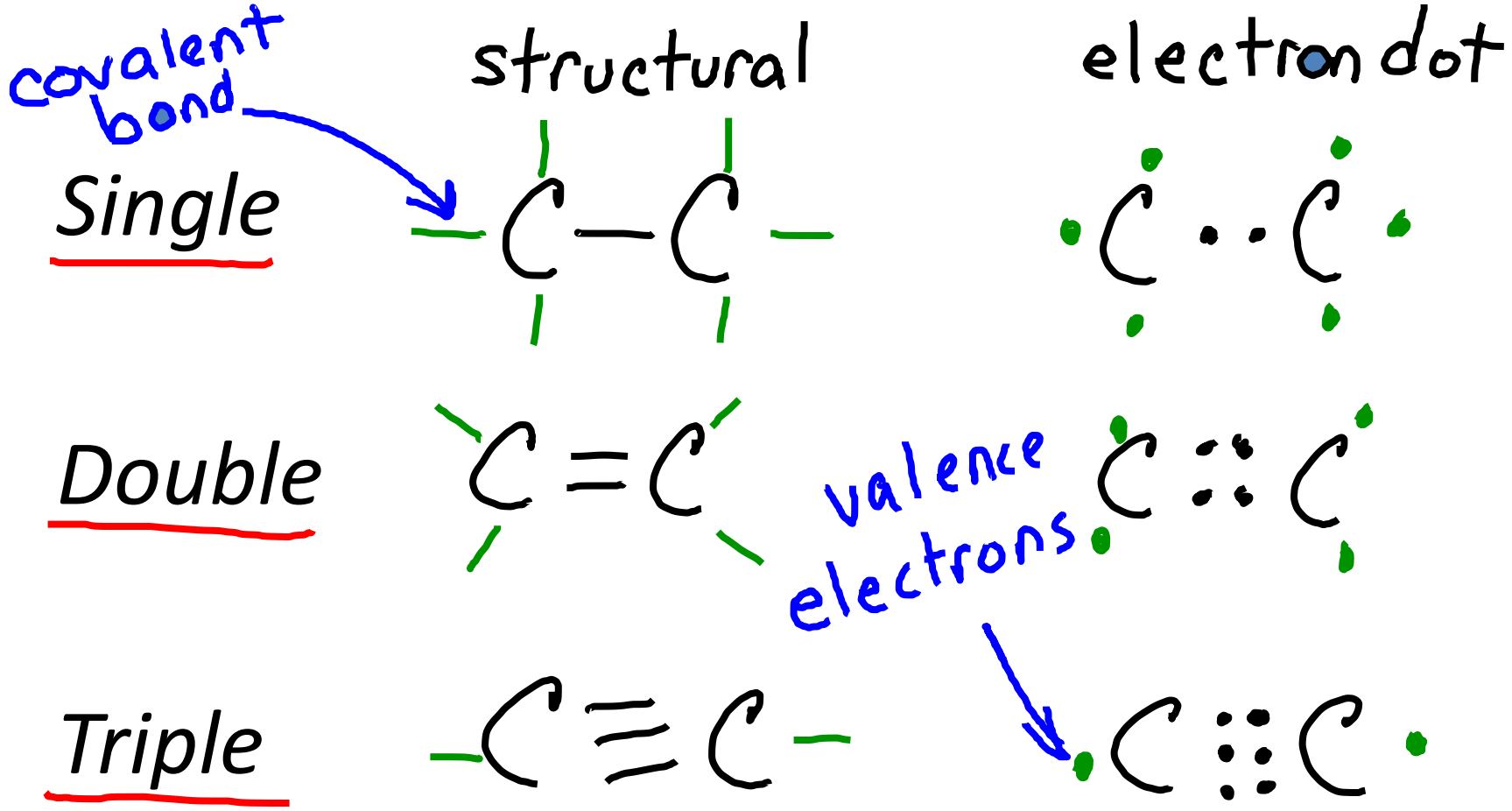




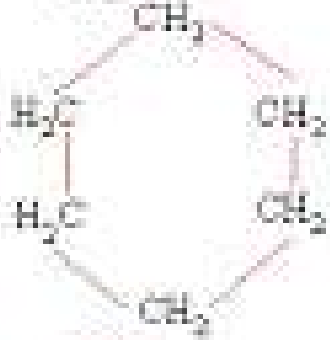
Triple



Types of Carbon Bonds



Organic Formulas

Compound name	Molecular formula	Condensed / Structural formula
Methane	CH_4	or CH_4
n - propyl alcohol	C_3H_8OH	$CH_3-CH_2-CH_2-OH$
isopropyl alcohol	C_3H_8OH	
Cyclohexane	C_6H_{12}	
Benzene	C_6H_6	or

Organic Formulas

Molecular –

Organic Formulas

Molecular – shows kind and number of elements

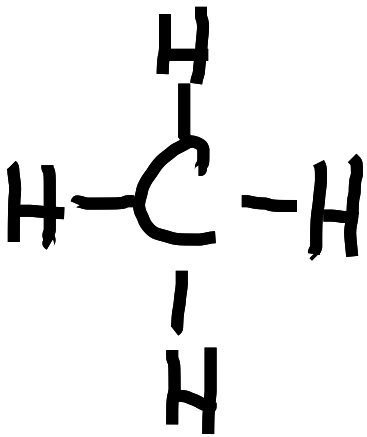
$$CH_4$$

Organic Formulas

Structural –

Organic Formulas

Structural – shows kind, number, and arrangement of elements



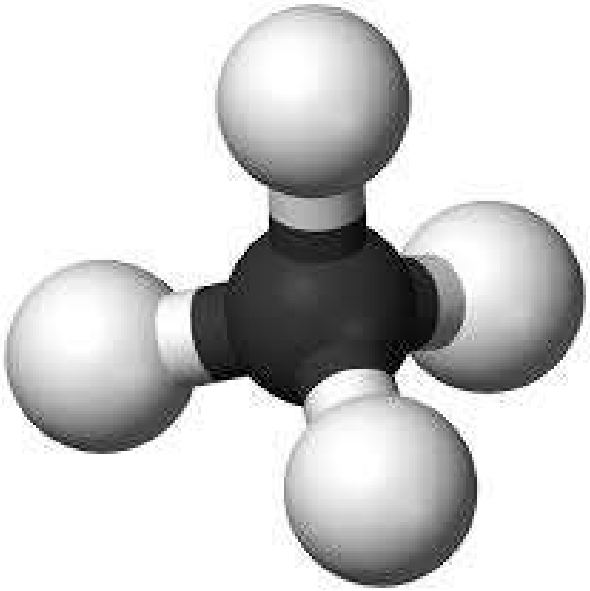
Naming Hydrocarbons

Prefixes: (refers to # carbons)

Naming Hydrocarbons

Prefixes: (refers to # carbons)

meth- 1 carbon

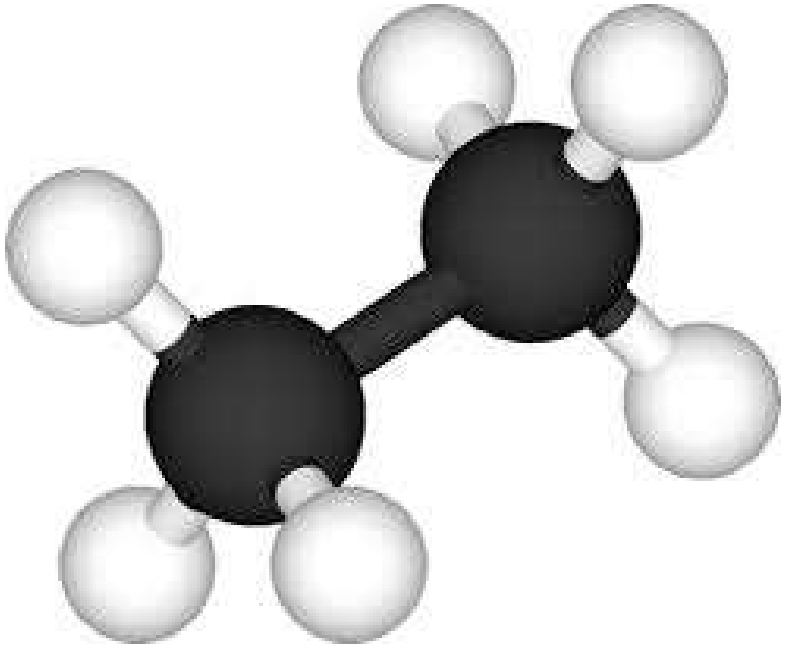


Naming Hydrocarbons

Prefixes: (refers to # carbons)

meth- 1 carbon

eth- 2 carbons



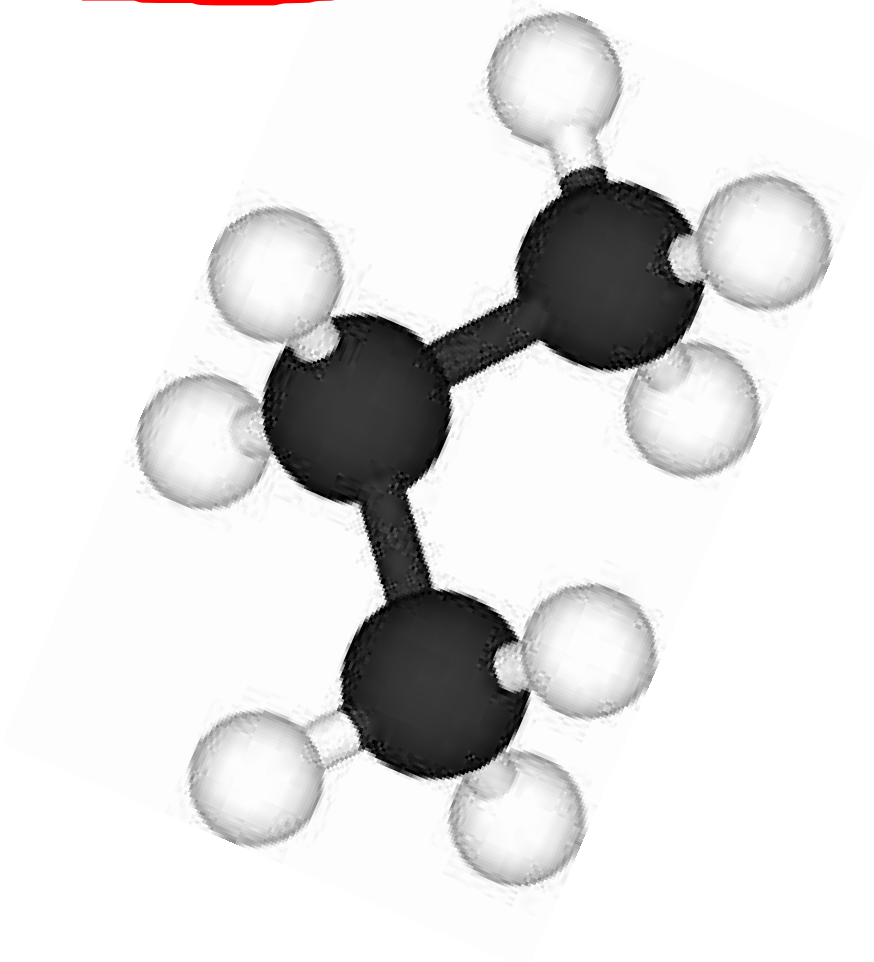
Naming Hydrocarbons

Prefixes: (refers to # carbons)

meth- 1 carbon

eth- 2 carbons

prop- 3 carbons



Naming Hydrocarbons

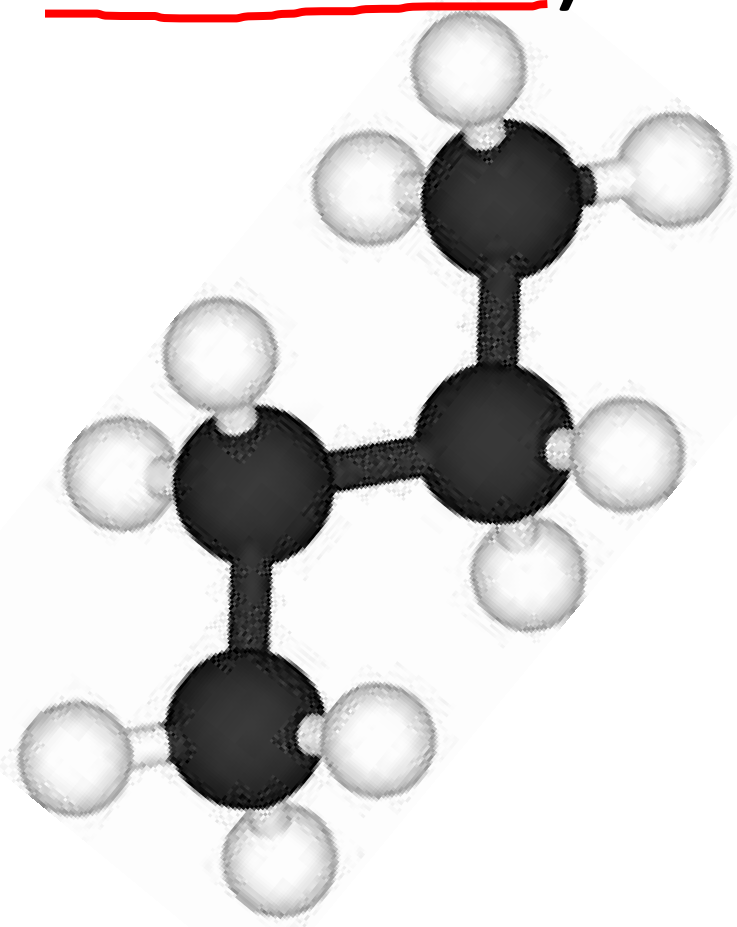
Prefixes: (refers to # carbons)

meth- 1 carbon

eth- 2 carbons

prop- 3 carbons

but- 4 carbons



Naming Hydrocarbons

Prefixes: (refers to # carbons)

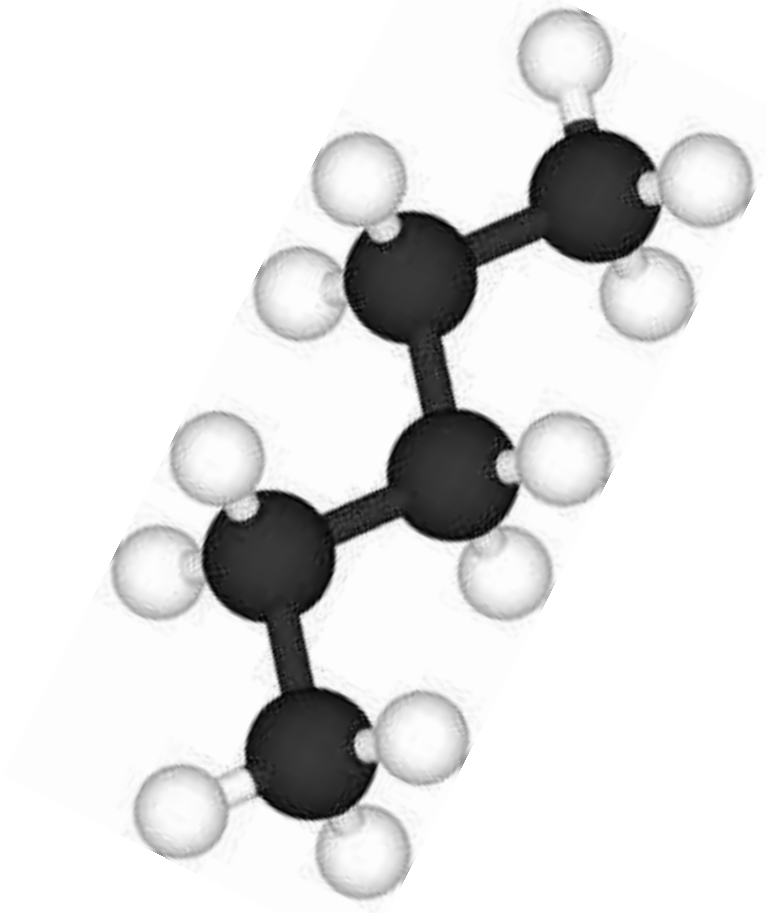
meth- 1 carbon

eth- 2 carbons

prop- 3 carbons

but- 4 carbons

pent- 5 carbons



Naming Hydrocarbons

Prefixes: (refers to # carbons)

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

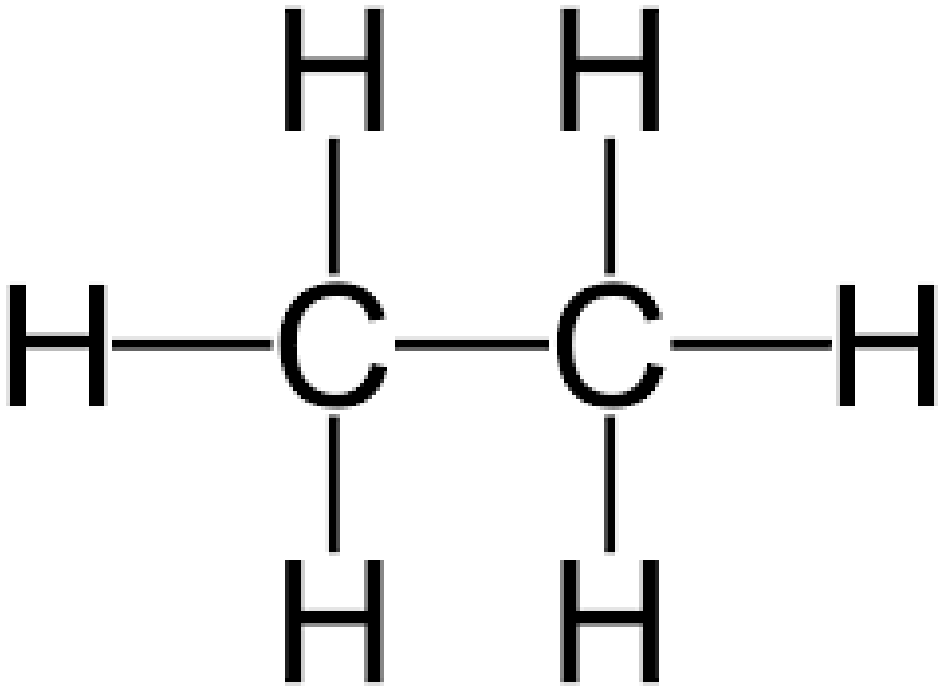
Naming Hydrocarbons

Suffixes: (refers to type of bond)

Naming Hydrocarbons

Suffixes: (refers to type of bond)

-ane : single bond (alkanes)

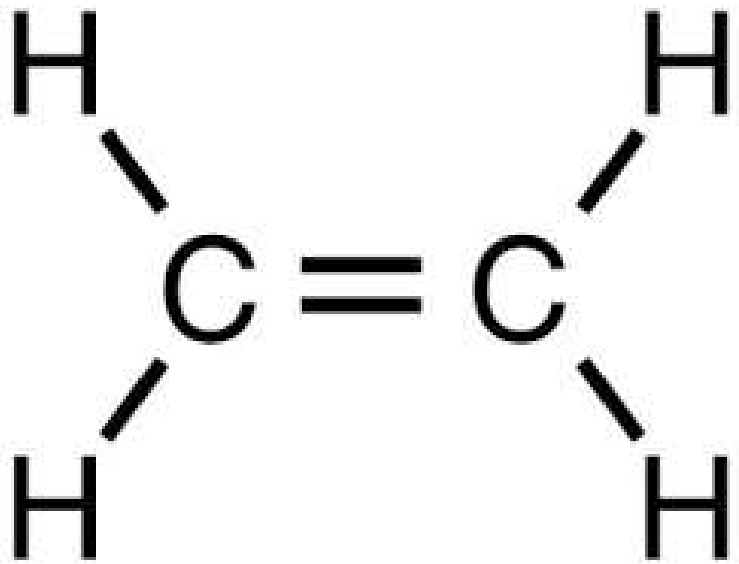


Naming Hydrocarbons

Suffixes: (refers to type of bond)

-ane : single bond (alkanes)

-ene : double bond (alkenes)



Naming Hydrocarbons

Suffixes: (refers to type of bond)

-ane : single bond (alkanes)

-ene : double bond (alkenes)

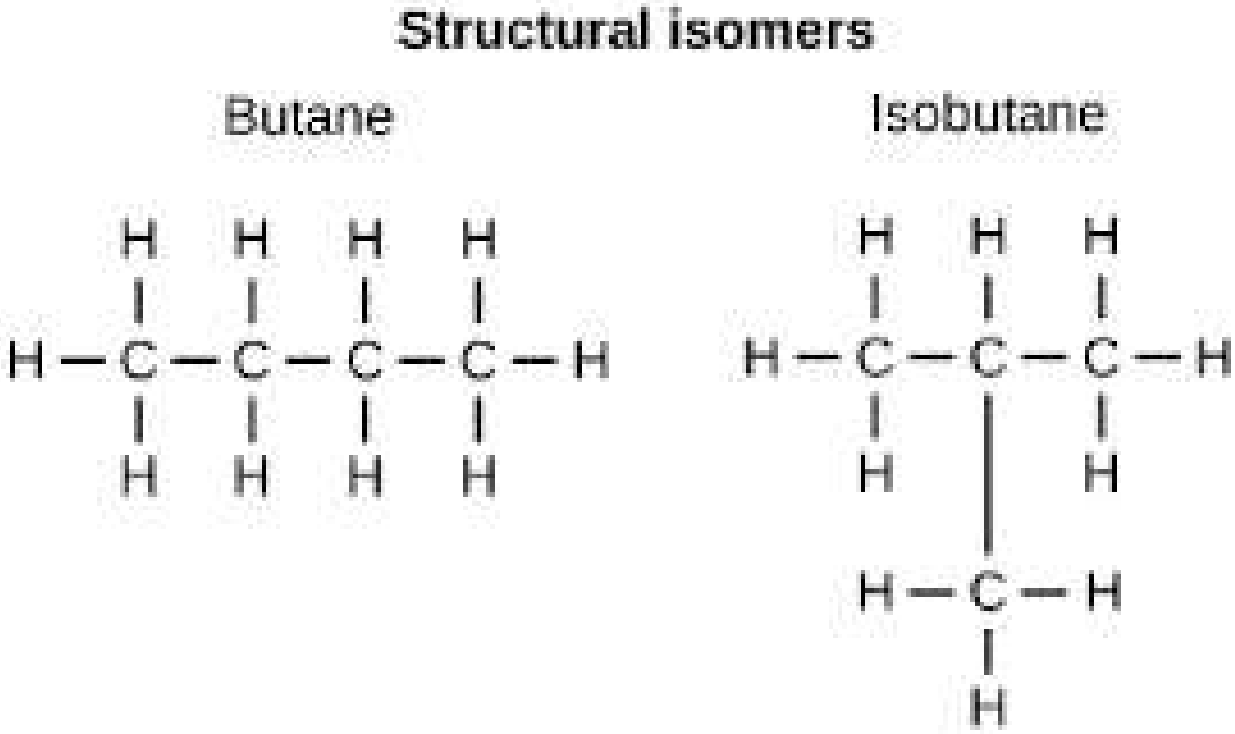
-yne : triple bond (alkynes)

Isomers

Compounds with same molecular, but different structural formulas

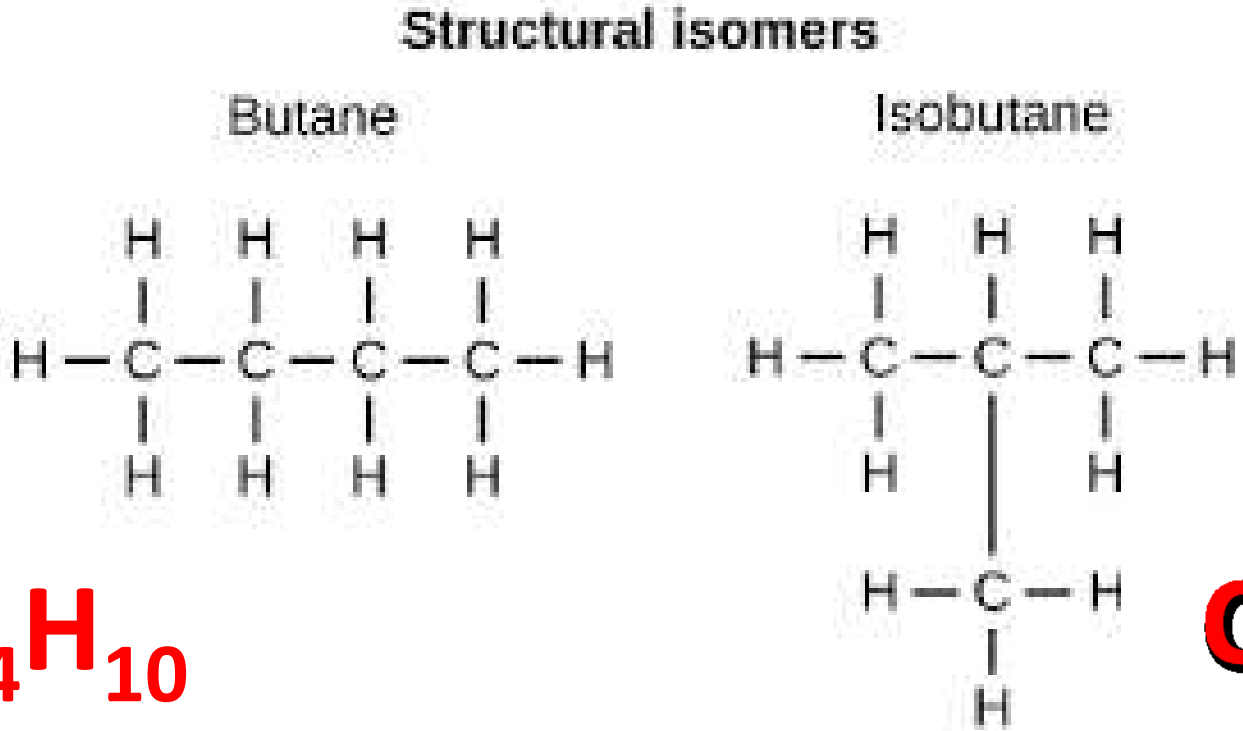
Isomers

Compounds with same molecular, but different structural formulas



Isomers

Compounds with same molecular, but different structural formulas



C_4H_{10}

C_4H_{10}

Example

name

prefix → # of carbons

suffix → type of bond

Example

name

model

structural formula

molecular formula

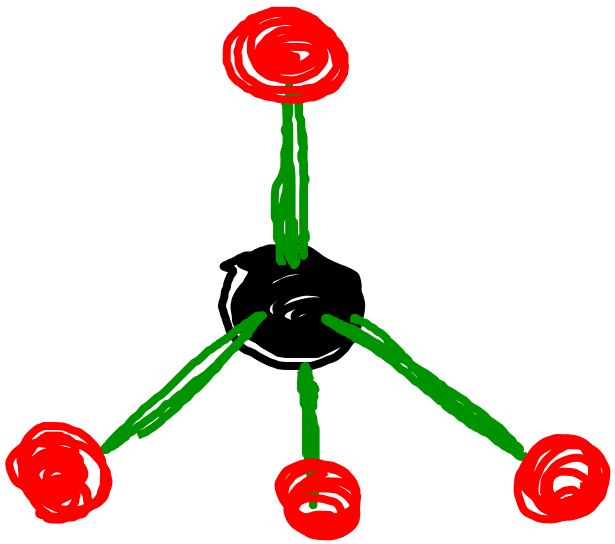
Name: *Methane*

Name: ***Methane***

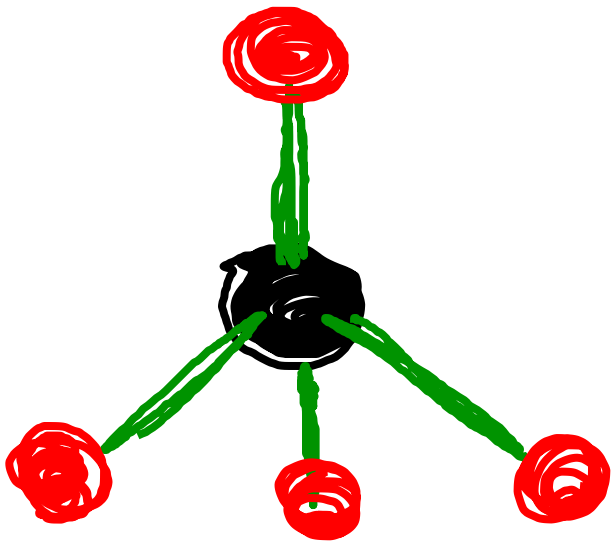
Meth- ONE carbon

-ane SINGLE bonds

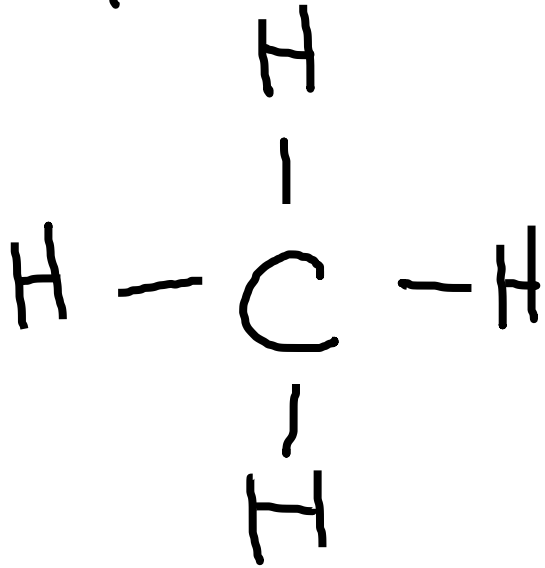
Model



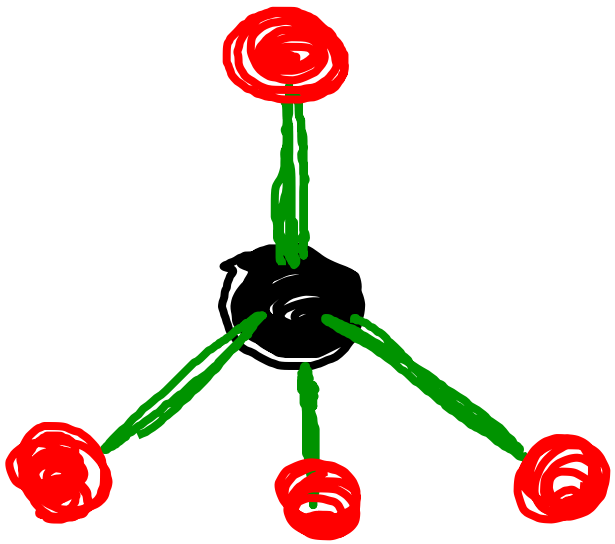
Model



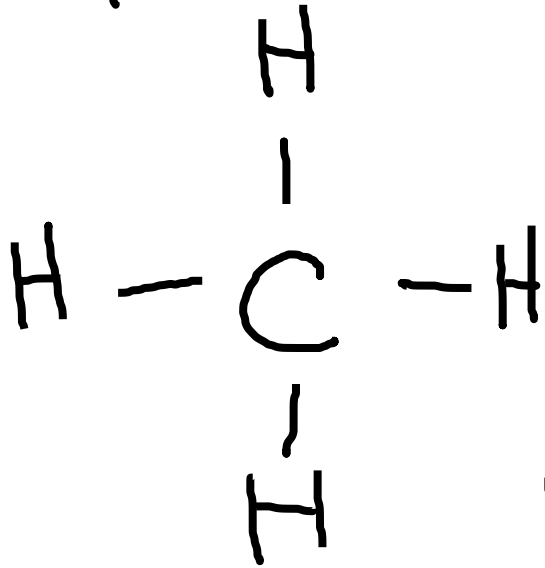
Structural Formula



Model



Structural Formula



Molecular Formula

CH_4

Activity

methane:

Activity

ethane:

Activity

propane:

Activity

ethene:

Activity

ethyne:

Activity

octane:

Activity

hexane (ring): (aka benzene)