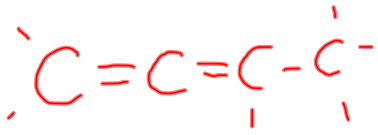
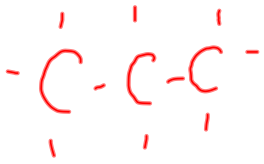
Why does carbon form a large variety of compounds?

- 4 bonds
- double/triple bonds



- chains and rings

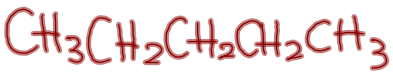


Structural Models and Diagrams

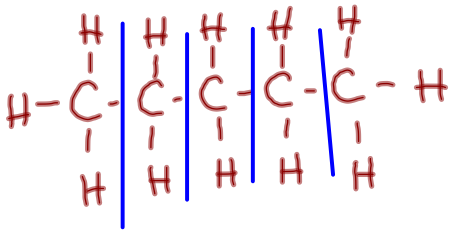
Molecular formula

Ex. C_5H_{12}

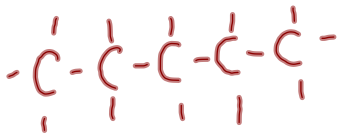
Expanded molecular formula

Ex. 

Complete structural diagram

Ex. 

Condensed structural diagram

Ex. 

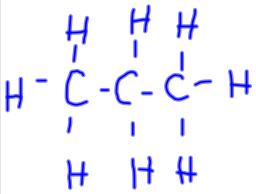
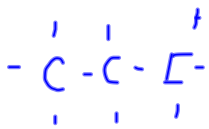
Line Diagram

Ex. 

For C_5H_{12}?

***Find longest chain**
***Begin counting from either end**

Quick Review of Structural Models and Diagrams

	separate C's ↓	Atoms and Bonds ↓	No H's ↓	C's at end of line segment ↓
Molecular Formula	**Expanded Molecular Formula**	**Complete Structural Diagram**	**Condensed Structural Diagram**	**Line Diagram**
C_3H_8	$CH_3CH_2CH_3$			

Organic Families

Organic families are classed according to functional groups. Functional groups are areas on a molecule that are reactive.

Hydrocarbons with general formula C_nH_{2n+2} contain all single bonds and are called **alkanes**.

Ex.

Hydrocarbons with general formula C_nH_{2n} contain one double bond (**alkenes**) or are cyclic (**cycloalkanes**).

"closed ring"

Hydrocarbons with a general formula $\mathbf{C_nH_{2n-2}}$ have a triple bond (**alkynes**) or are cyclic with a double bond (**cycloalkenes**).

The prefixes for compounds or alkyl groups with one to 10 carbons are shown in the chart on p. 695.

FORMULA	IUPAC NAME	ALKYL GROUP	ALKYL NAME
CH_4	meth ane	CH_3	meth yl
C_2H_6	eth ane	C_2H_5	eth yl
C_3H_8	prop ane	C_3H_7	prop yl
C_4H_{10}	but ane	C_4H_9	but yl

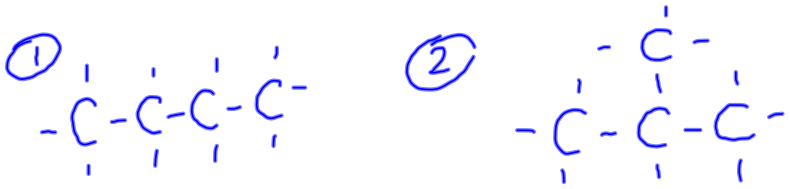
The remaining 6 follow latin naming.

Isomers

Structural Isomers - compounds with the same molecular formula, but atoms are connected differently

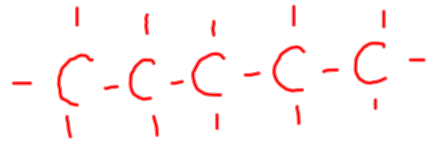
***Find longest chain**
***Begin counting from either end**

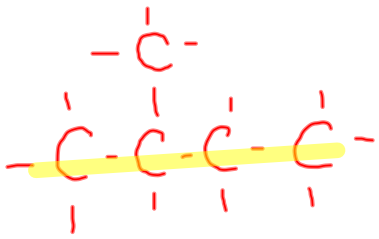
Ex. C_4H_{10}

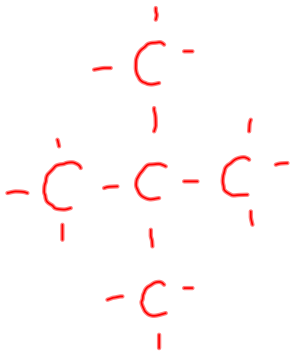


How many isomers can be drawn for C_2H_6?

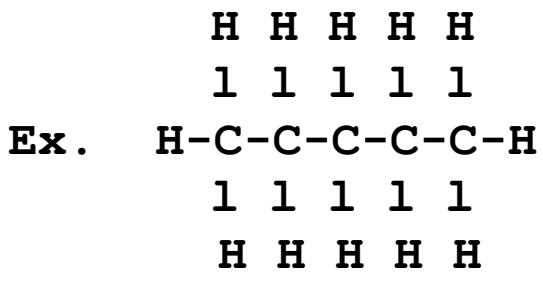
C_5H_{12}

① 

② 

③ 

Isomers



Homework

Structural Diagram Worksheet

Draw all the structural isomers for C_6H_{14}.