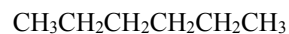
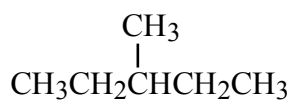


(1) Define structural isomer:

(2) C_6H_{14} has five structural isomers. Give the name for each of the given drawings or the drawing for each of the given names.



2-Methylpentane



2,3-Dimethylbutane

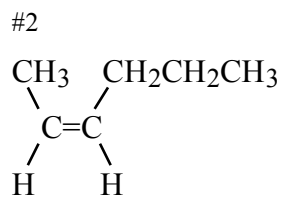
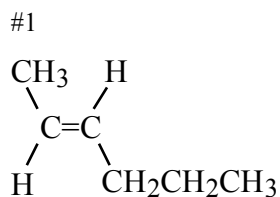


(3) (a) Define stereoisomer:

(b) In what type of hydrocarbon are stereoisomers displayed?

(c) When naming stereoisomers, the isomer with the hydrogen atoms shown on the same side of the double bond of molecule is called the _____ isomer or the _____ isomer and the isomer with the hydrogen atoms shown on opposite sides of the double bond of molecule is called the _____ isomer or the _____ isomer.

(4) (a) Give *two* names for each of the two stereoisomers of 2-hexene.



(5) Name and draw the two stereoisomers of 3-hexene.

(6) Name and draw the two stereoisomers of 4-nonene.

(7) (a) (i) Draw the molecule 1-pentene.

(ii) What is the chemical formula for 1-pentene?

(b) (i) Draw the molecule cyclopentane.

(ii) What is the chemical formula for cyclopentane?

(c) Compare the chemical formula for 1-pentene and cyclopentane. How are these molecules related to each other?

(d) What is the general formula for an alkene? What would you predict is the general formula for a cycloalkane?

(e) Complete the drawings and names for eight *other* structural isomers with the same chemical formula as 1-pentene and cyclopentane.

	$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_2=\text{CCH}_2\text{CH}_3 \end{array}$		$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3\text{C}=\text{CHCH}_3 \end{array}$
_____ - pentene	_____ - butene	_____ - butene	_____ - butene

	$\begin{array}{c} \text{CH}_2 \\ / \quad \backslash \\ \text{CH}_2 \text{---} \text{C} \text{---} \text{CH}_3 \\ \\ \text{CH}_3 \end{array}$		$\begin{array}{c} \text{CH}_2\text{CH}_3 \\ \\ \text{CH} \\ / \quad \backslash \\ \text{CH}_2 \text{---} \text{CH}_2 \end{array}$
_____ cyclobutane	_____ cyclopropane	_____ cyclopropane	_____ cyclopropane

(f) One of the additional structural isomers has two stereoisomers. Identify the compound with two stereoisomers. Name and draw both stereoisomers.

(8) (a) (i) Draw the molecule 1-propyne.

(ii) What is the chemical formula for 1-propyne?

(b) (i) Draw the molecule cyclopropane.

(ii) What is the chemical formula for cyclopropane?

(c) Compare the chemical formula for cyclopropane and 1-propyne. How are these molecules related to each other?

(d) What is the general formula for an alkyne? What would you predict is the general formula for a cycloalkene?