Chemistry 30B Experiment 3

Lab Instructor:	Name:			
1,2. Structures of methane				
Three-dimensional shape	Complete structural formula		Condensed structural formula	
3. Structures of ethane and pro	nane			
proj				
	Etr	nane		
Complete structural formula		Condensed structural formula		
	Prop	oane		
Complete structural formula		Condensed str	uctural formula	
4,5,6. Structures of C ₄ H ₁₀				
, , ,	Dute			
	Buta			
Complete structural formula		Condensed str	uctural formula	

Isobutane						
Complete structura	nplete structural formula Co		Condens	Condensed structural formula		
7. Physical propert	ties of isomers of	C ₄ H ₁₀				
Isomer	Molar mass	Melting	point	Boiling point	Density	
Butane						
2-Methylpropane (Isobutane)						
8. Isomers of C ₅ H ₁	2					
Name of above iso			Condons	ed structural formu		
Complete structural formula		Condensed structural formula				
Name of above iso	omer:					
Complete structura			Condens	sed structural formu	la	
Name of above iso	mer:					

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8. Physical properties of ison				<u></u>	
Name of isomer	Molar mass	Melting point	Boiling point	Density	
9. Cycloalkanes					
		Cyclopropane			
Complete etructural formula	Condonsed	structural formula	Geometrie for	mula	
Complete structural formula	Condensed	structurar formula	Geometric for	Geometric formula	
		<u> </u>			
		Cyclobutane			
Complete structural formula	Condensed	Condensed structural formula		Geometric formula	
		Cyclopentane	1		
Complete structural formula	Condensed	structural formula	Geometric for	mula	
r	2 2 23 22 2 2 3				

11, 12. Structures of chlorinated methane	
Three-dimensional structure of CH ₃ Cl	Three-dimensional structure of CH ₂ Cl ₂
Are there different isomers possible for CH ₂ Cl ₂	? Explain.
Given the structures below: are these molecules	isomers or equivalent? Explain.
13, 14, 15. Structures of chlorinated ethane	
Look at your model of ethane, CH ₃ CH ₃ . Are all	of the hydrogen atoms equivalent? Explain.
Three-dimensional structure of CH ₃ CH ₃	Three-dimensional structure of CH ₃ CH ₂ Cl
Are there different isomers possible for CH_3CH Structure of first isomer of $C_2H_4Cl_2$	² Cl? Explain.

Three-dimensional structure	Condensed structural formula
Name of above isomer:	
Structure of second isomer of C ₂ H ₄ Cl ₂	
Three-dimensional structure	Condensed structural formula
Name of above isomer:	
16. Models of chorinated propane	
How many isomers are possible for the molecular	
Draw the condensed structural formula and name	e each isomer.
Make models of the molecules.	

Questions

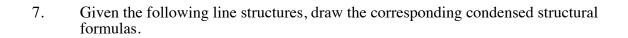
- 1. For each of the following pairs of molecules, state whether they are isomers, identical, or neither. Briefly explain your reasoning in each case.

 - c. $\begin{array}{c} CH_3 \\ \\ H_3C CH \\ \\ CH_3 \end{array} \quad \text{and} \quad \begin{array}{c} CH_3 \\ \\ \\ H_3C C CH_3 \\ \\ \\ CH_3 \end{array}$
 - d. $\begin{array}{c} H_3C \overset{H_2}{-C} \\ \downarrow \\ CH CH_3 \\ \downarrow \\ CH_3 \end{array} \quad \text{and} \quad \begin{array}{c} CH_3 \\ \downarrow \\ H_3C \overset{C}{-C} \overset{C}{-C} \overset{C}{-C} \\ H_2 \end{array}$

 - g. $H_3C C C CH_3$ and
- 2. Name each of the molecules in question #1 above.
- 3. Name each of the following molecules.

- 4. Draw condensed structural formulas for:
 - 3-ethylpentane
 - 1-bromo-3-chlorocyclopentane
 - 1,2-dibromobutane
 - methylcyclohexane
- 5. Write the condensed structural formulas for all isomers of C₄H₉Br. Name each isomer.

6. Write the condensed structural formulas for all isomers of C₆H₁₄. Name each isomer.



$$\bigvee_{N}$$

8. Given the following condensed structural formulas, draw the corresponding line structures.

$$\begin{array}{c|c} CI & CI & Br & O \\ \hline \\ CH_3CH_2CHCHCH_2CH_2CHCH_3 & CH_3CHCHCOH \\ \hline \\ H_3C & CH_3 & CI \\ \end{array}$$

$$H_2C$$
 $=$ CCH_2OCH_3