Che251 Isomers Worksheet

1. Draw three constitutional isomers with the molecular formula C_3H_8O.

2. How many constitutional isomers can you draw for $C_4H_{10}O$.

3. Draw the cis and trans isomers for
   a) 1-bromo-4-chlorcyclohexane b) 1-ethyl-3-methylcyclobutane.

4. Which of the following compounds can exist as cis-trans isomers? For those compounds that can exist as cis and trans isomers, draw and label the isomers. Also, draw the skeletal structures.

   1. $CH_3CH{=}CHCH_2CH_2CH_3$ **3.** $CH_3CH{=}CHCH_3$

   2. $CH_3CH_2C(CH_2CH_3){=}CHCH_3$ **4.** $CH_3CH_2CH{=}CH_2$

5. Draw four compounds with the formula C_5H_{10} that have a carbon-carbon double bond but do not have Cis-trans isomers.

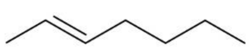
6. Draw and label the E and Z form for each.

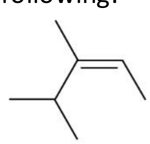
a. $CH_3CH_2CH{=}CHCH_3$

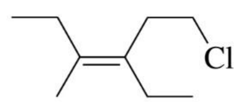
b. $CH_3CH_2\underset{\displaystyle Cl}{\underset{|}{C}}{=}CHCH_2CH_3$

c.
$$\begin{array}{l} CH_3CH_2CH_2CH_2 \\ \qquad\qquad\quad | \\ \quad CH_3CH_2C{=}CCH_2Cl \\ \qquad\qquad\qquad\quad | \\ \qquad\qquad\quad CH_3CHCH_3 \end{array}$$

7. Use E and Z notation to name the following:

a. 

b. 

c. 

8. Which of the following has an asymmetric center?

a. $CH_3CH_2\underset{\displaystyle Cl}{\underset{|}{C}}HCH_3$

b. $CH_3CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_3$

c. $CH_3CH_2\overset{\displaystyle CH_3}{\overset{|}{\underset{\displaystyle Br}{\underset{|}{C}}}}CH_2CH_2CH_3$

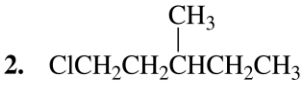
d. CH_3CH_2OH

e. $CH_3CH_2\underset{\displaystyle Br}{\underset{|}{C}}HCH_2CH_3$

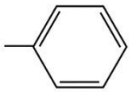
f. $CH_2{=}CH\underset{\displaystyle NH_2}{\underset{|}{C}}HCH_3$

9. Draw the enantiomers using a) perspective diagrams and b) Fischer diagrams for:

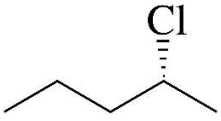
1. 

2. 

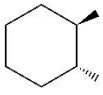
10. Assign priorities to the following sets.

a.	$-CH_2OH$	$-CH_3$	$-H$	$-CH_2CH_2OH$
b.	$-CH_2Br$	$-OH$	$-CH_3$	$-CH_2OH$
c.	$-CH(CH_3)_2$	$-CH_2CH_2Br$	$-Cl$	$-CH_2CH_2CH_2Br$
d.	$-CH{=}CH_2$	$-CH_2CH_3$		$-CH_3$

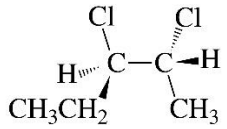
11. Does the following have R or S configuration?

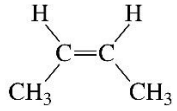


12. Draw an enantiomer and a diastereomer for the following compound.



13. Draw a diastereomer for each of the following.

b. 

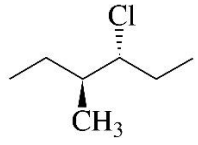
c. 

14. Draw the meso compound for 3,4-dimethylhexane.

15. Draw the perspective diagram for:

    a) (S)-3-chloro-1-pentanol
    b) (2R,3R) 2,3-dibromopentane

16. Name the following:

a. 

b.