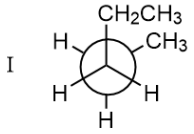
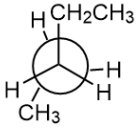
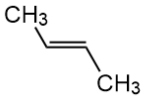
Dr. Laurie S. Starkey, CHM 3140 Organic Chemistry I, Cal Poly Pomona
Chapter 5 Stereochemistry, Part 1 – Practice Problems

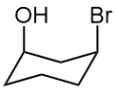
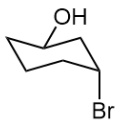
Many of these problems are from the Ch. 5 skeleton notes (page).

1

Which of the following pairs are examples of **conformers**?

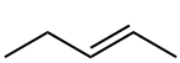
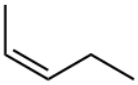
I  and 

II  and 

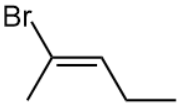
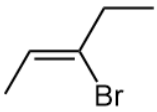
III  and 

2 p.5-1

Group Work: categorize each pair of compounds (circle one: isomers, stereoisomers or neither).

 and 

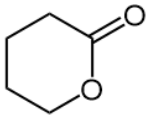
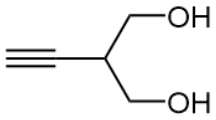
isomers stereoisomers neither

 and 

isomers stereoisomers neither

 and 

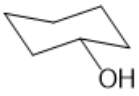
isomers stereoisomers neither

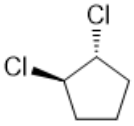
 and 

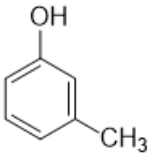
isomers stereoisomers neither

3

Determine whether each of the given compounds is chiral or achiral.







p.5-3

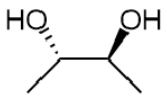
All **chiral** objects have non-superimposable mirror images. (e.g., a student desk)

Every chiral molecule has an _____

All **achiral** objects are exactly the same as their mirror images. (e.g., a chair without arms)

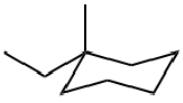
An achiral molecule does / does not have an enantiomer.

Determine whether each molecule is *chiral* or *achiral*, and determine whether or not it has an enantiomer. Consider redrawing chairs as hexagons.



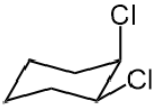
Chiral? _____

Has an _____ enantiomer?



Chiral? _____

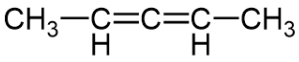
Has an _____ enantiomer?

4 

Chiral? _____

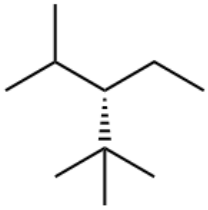
Has an _____ enantiomer?

5 Use drawings to explain why the following compound is chiral. (*hint: draw a 3D sketch and look for planes of symmetry*) *(Klein 5.9)*



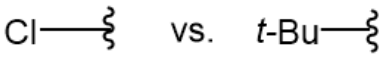
6 Give a complete name for the given compound (include stereochemistry).

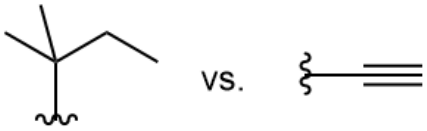
7



Group activity: which substituent would have the higher priority?

8





9 Provide a drawing for the following name:

(3*S*, 4*R*)-1,3,4-trichloro-2-(chloromethyl)heptane