CH105: Organic Chemistry

Tutorial-2

1. Locate any plane of symmetry or center of symmetry in each one of the following. Which one is chiral and which one is achiral?

   a) (E) –1, 2 –Dichloroethene
   b) cis –1, 2 –dichlorocyclopropane
   c) (Z) –1, 2 –Dichloroethene
   d) trans –1, 2 –dichlorocyclopropane

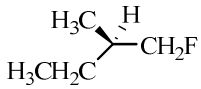
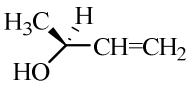
2. A meso stereoisomer is possible for one of the following. Which one?

   a) 2, 3–dibromopentane
   b) 2, 4 –dibromopentane
   c) 3 –bromo –2 –pentanol
   d) 4-bromo–2 –pentanol

3. List the substituents in each of the following sets in order of priority from highest to lowest.

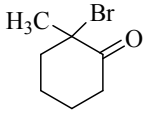
   a) -Cl, -OH, -SH, -H
   b) $-CH_3$, $-CH_2Br$, $-CH_2Cl$, $-CH_2OH$
   c) -H, -OH, -CHO, $-CH_3$
   d) $-CH(CH_3)_2$, $-C(CH_3)_3$, -H, $-CH{=}CH_2$
   e) -H, $-N(CH_3)_2$, $-OCH_3$, $-CH_3$

4. Assign absolute configurations as R or S and write the Fischer projection for each.

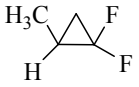
   a) 
   b) 

5. Draw three – dimensional representations of,

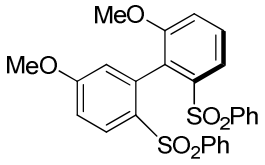
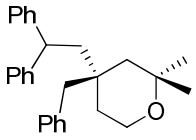
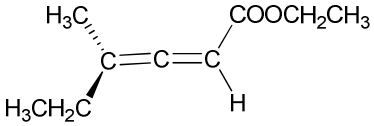
   a) R enantiomer of

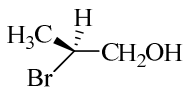
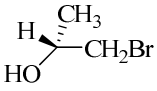
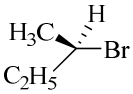
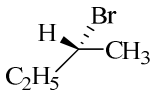
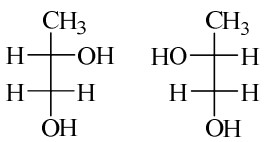
   b) S enantiomer of

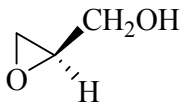
6. Determine the absolute configuration of the following chiral molecules

   a) 
   b) 
   c) 

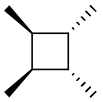
7. Identify the relationship in each of the following pairs as constitutional isomers, diastereomers, enantiomers or identical.

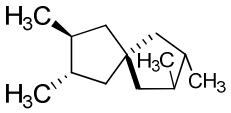
   a) 
   
   b) 
   
   c) 

8. (a) Assign the configuration of glycidol (given below). (b) This optically pure enantiomer has $[\alpha] = +12°$ (neat, without solvent). What would be the measured rotation of a sample of this compound if it is contaminated by its enantiomer such that 25% of the sample is its enantiomer?



9. Identify all the symmetry elements and comment on whether the following molecules are chiral or not?

a) 

b) 

c)