5.7: Answers to Practice Questions Chapter 5

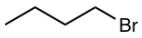
5.1 Order the following groups based on decreasing priority for E/Z naming purpose.

Answer: D > C > A > B

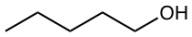
5.2

1. Draw the structure of following compounds, determine which one has an chirality center and label it with a star.

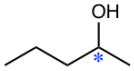
a) 1-bromobutane **no**



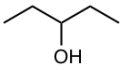
b) 1-pentanol **no**



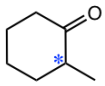
c) 2-pentanol **yes**



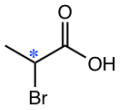
d) 3-pentanol **no**



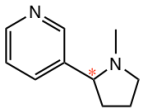
e) 2-bromopropanoic acid **yes**



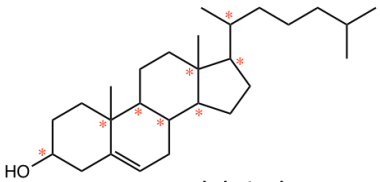
f) 2-methyl cyclohexanone **yes**



2. Label all the chirality centers in the following molecules.

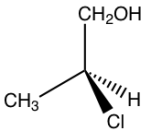


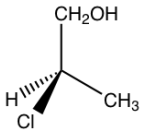
nicotine



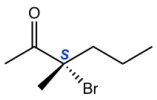
cholesterol

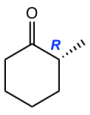
5.3 Draw the pair of enantiomers of 2-chloro-1-propanol.

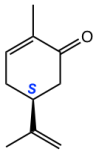




5.4 Determine the R/S configuration of the chirality center in following compounds.

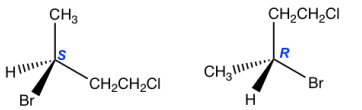






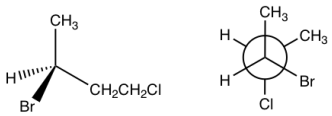
5.5 Determine the relationship for each pair of molecules: enantiomers, identical, constitutional isomers, non-isomer:

1)



enantiomers

2)

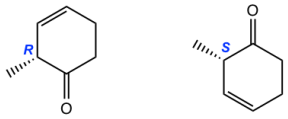


constitutional isomers

3)

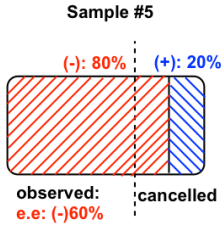
identical

4)



enantiomers

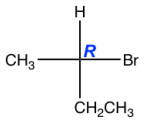
5.6 Draw the diagram for **Sample #5** by referring to the diagram for Sample #4.

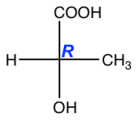


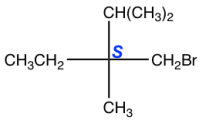
5.7 Explain that why in step 3 of the above procedure, the answer should be **reversed** to get the final (actual) configuration?

According to the definition of Fisher projection, the horizontal bond is the bond pointing towards the viewer. Therefore when the lowest priority group is on a horizontal bond, it is on the position just ***opposite*** to the way defined by the Cahn-Ingold-Prelog rule, so the actual configuration should be the reversed version of whatever obtained initially.

5.8 Indicate the configuration of the following compounds.



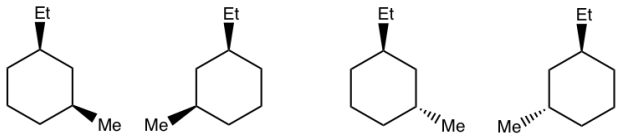




5.9

- Draw all stereoisomers for 1-ethyl-3-methylcyclohexane.

cis ***trans***



- Draw all stereoisomers for 1-ethyl-4-methylcyclohexane.

cis ***trans***

- Draw all stereoisomers for 1,2-dimethylcyclohexane.