Stereochemistry Answers:

1. Draw a Fischer Projection for the following chiral, tetrahedral carbon:

There are multiple correct answers for this problem!

2. Assign R or S to the following molecules: You must put the lowest priority group in the BACK (or top/bottom for Fischer Projection) before making R or S assignment

(a) 
(b)

3. [10 pts] identify each of the following pairs of compounds as identical molecules, enantiomers, or diastereomers. Must show work to obtain partial credit.

Top Chiral centers match-up, Bottom Chiral centers do not match up

diastereomers!

4. (a) Calculate the specific rotation for Compound A, whose observed rotation was (+) 35.0 for a solution made from 0.200 g dissolved in 2 mL of chloroform solvent. The cell path length was 10 cm.

Concentration is in g/mL (0.200 g/2 mL), the cell path length is in decimeters (10 cm = 1 dm)

\[ [\alpha] = \alpha / (C)(l) \] so the specific rotation = \((35.0)/(0.1)(1) = (+) 350 \text{ degrees (don’t forget the sign of rotation!! It doesn’t mean positive/negative – it means left or right rotation)} \]

(b) Calculate the observed rotation for Compound A, whose specific rotation was (+) 176.0 for a solution made from 0.250 g dissolved in 1 mL of chloroform solvent. The cell path length was 5 cm.

\((+176 \text{ degrees} = \alpha / (0.250 \text{ g/mL})(0.5 \text{ dm}) \]

Solve for \(\alpha\)

\[ \alpha = (+) 22 \text{ degrees} \]
5. Consider the reaction below:

\[ \text{H}_2, \text{Pd/C} \]

How many stereoisomers are possible? 4 potentially, but this only adds SYN so you will get a mixture of two enantiomers. You started with a chiral material and you must form a mixture of diastereomers as a result!