1. **Properties - Board Writing Activity in Groups**

   **Optical Activity:** How much a molecule polarizes light
   - Chiral compounds non-racemic mixes have OA
   - A chiral compound + racemic mixes don't have OA
   Specific rotation: equal & opposite b/w enantiomers, not for dia
   Physical props (mp, bp, solb, polarity) same for enants, diff for dias

2. **Multiple Chiral Centers**

   - Max # stereoisomers = \(2^n\) (\(n = \#\) of chiral centers)

   5.24 Draw all possible stereoisomers for each of the following compounds. Each possible stereoisomer should be drawn only once:

   ![diagrams of stereoisomers]

   (d) With two chiral centers, there are four stereoisomers (no meso compounds).

**Meso Compound: A Chiral Compounds w/ Multiple Chiral Centers**

- Internal plane of symmetry - can rotate to get there

5.51 Each of the following compounds possesses a plane of symmetry. Find the plane of symmetry in each compound. In some cases, you will need to rotate a single bond to place the molecule into a conformation where you can more readily see the plane of symmetry.

![diagrams of compounds]

(a) We must first rotate 180 degrees about the central carbon-carbon bond, in order to see more clearly that the compound possesses a plane of symmetry, shown below:

(b) We must first rotate 180 degrees about the central carbon-carbon bond, in order to see more clearly that the compound possesses a plane of symmetry, shown below:

(c) We first convert the Newman projection into a bond-line drawing:

![diagram of molecule conversion]
5.24 Draw all possible stereoisomers for each of the following compounds. Each possible stereoisomer should be drawn only once:

(a) ![Chemical structure](image)
(b) ![Chemical structure](image)
(c) ![Chemical structure](image)

(c) With two chiral centers, we would expect four stereoisomers. However, there are only three stereoisomers in this case, because the first one shown below is a *meso* compound.

![meso](image)

5.55 Identify whether each of the following compounds is chiral or achiral:

(a) ![Chemical structure](image)
(b) ![Chemical structure](image)
(c) ![Chemical structure](image)
(d) ![Chemical structure](image)

5.55.

(a) This compound has a non-superimposable mirror image, and therefore it is chiral.
(b) This compound has a non-superimposable mirror image, and therefore it is chiral.
(e) This compound lacks a chiral center and is therefore achiral.
(d) This compound has a non-superimposable mirror image, and therefore it is chiral.


5.29 For each of the following alkenes, assign the configuration of the double bond as either E or Z.

(a) ![Chemical structure](image)
(b) ![Chemical structure](image)
(c) ![Chemical structure](image)
(d) ![Chemical structure](image)

5.29.

(a) The priorities (as shown below) are on opposite sides of the double bond, so this alkene has the E configuration.

![Priority](image)

(b) The priorities (as shown below) are on the same sides of the double bond, so this alkene has the Z configuration.

![Priority](image)

(e) The priorities (as shown below) are on the same sides of the double bond, so this alkene has the Z configuration.

![Priority](image)

(d) The priorities (as shown below) are on the same sides of the double bond, so this alkene has the Z configuration.

![Priority](image)