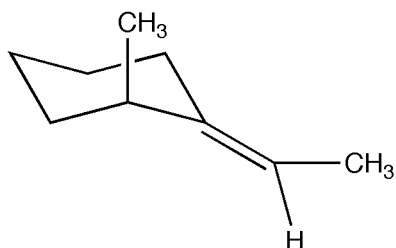


Exercise 6: Chirality

1. Would this molecule be better described using the cis-trans nomenclature system or the E,Z nomenclature system? Explain, then categorize it using the appropriate system.



2. Alanine is an amino acid with the formula $\text{HOOCCH}(\text{CH}_3)\text{NH}_2$.

a. Does it contain a chiral center? If so, how many?

b. Draw the stereoisomers of alanine, if any, using the perspective representation.

c. Draw the stereoisomers of alanine, if any, using the Fischer representation.

d. Identify each enantiomer as either R or S, and show an arrow that explains how you identified them.

3. Leucine has the formula $\text{HOOCCH}(\text{CH}_2\text{CH}(\text{CH}_3)_2)\text{NH}_2$; isoleucine has the formula $\text{HOOCCH}(\text{CH}(\text{CH}_3)(\text{CH}_2\text{CH}_3))\text{NH}_2$. Building the models will be helpful.

a. Are leucine and isoleucine constitutional isomers or geometric isomers? How can you tell?

b. How many asymmetric carbons do leucine and isoleucine have? Based on that answer, will leucine have enantiomers or diastereomers? Will isoleucine have enantiomers or diastereomers?

c. Draw the geometric isomers of isoleucine.

d. Identify each using the R, S nomenclature system.

e. Are any of these stereoisomers considered to be *meso*? Why or why not?