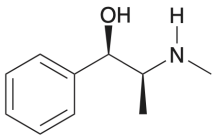
Hw3(2): Stereochemistry

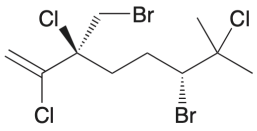
1. Each of the following compounds possesses carbon atoms that are chiral centers. Locate each of these chiral centers and identify the configuration of each one:

(a)



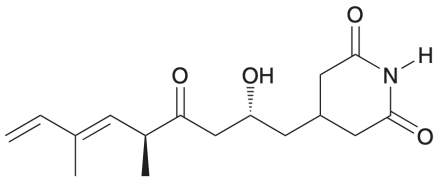
Ephedrine
A bronchodilator and decongestant
obtained from the Chinese plant *Ephedra sinica*

(b)



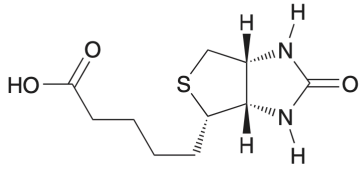
Halomon
An antitumor agent isolated
from marine organisms

(c)



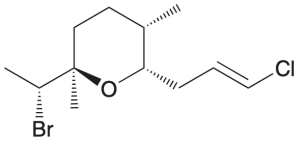
Streptimidone
An antibiotic

(d)



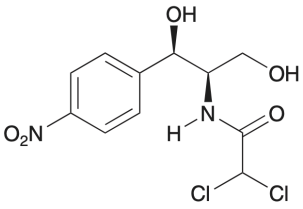
Biotin
(vitamin B_7)

(e)



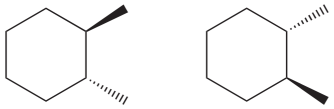
Kumepaloxane
A signal agent produced by *Haminoea cymbalum*,
a snail indigenous to Guam

(f)

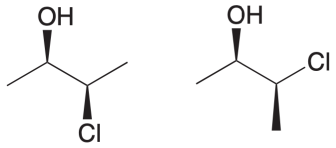


Chloramphenicol
An antibiotic agent isolated from
the *Streptomyces venezuelae* bacterium

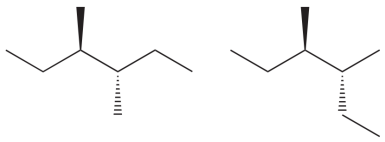
2. Identify whether each of the following pairs of compounds are enantiomers or diastereomers:

(a) 

(b) 

(c) 

(d) 

(e) 

3. When 0.575 g of monosodium glutamate (MSG) is dissolved in 10.0 mL of water and placed in a sample cell 10.0 cm in length, the observed rotation at 20°C (using the D line of sodium) is +1.47°. Calculate the specific rotation of MSG.

4. The specific rotation of l-dopa in water (at 15°C) is −39.5. A chemist prepared a mixture of l-dopa and its enantiomer, and this mixture had a specific rotation of −37. Calculate the % *ee* of this mixture.

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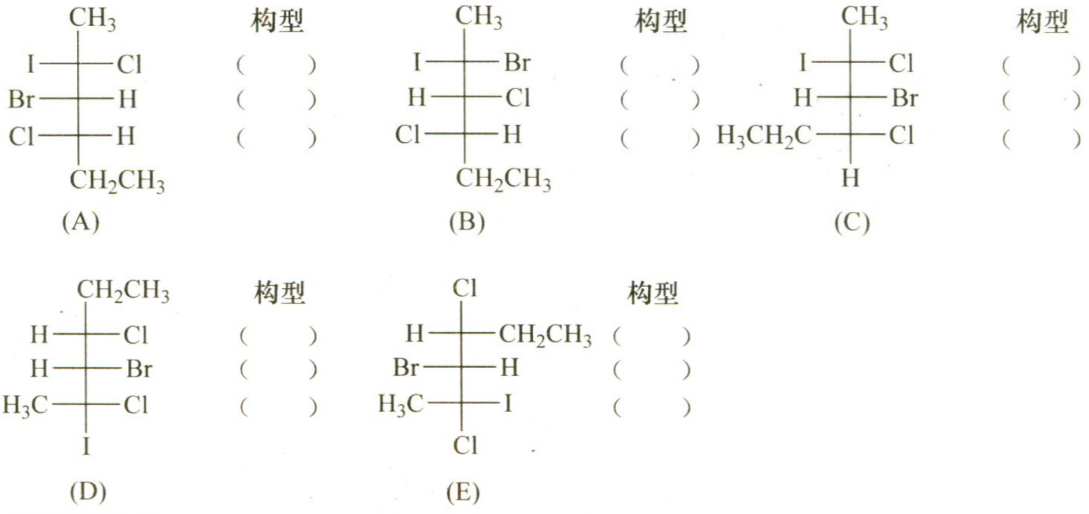
6. Assign a R/S configuration for each chiral center of the following compounds, and show the relationships between compound A and others (identical, enantiomers, diastereomers).



7. Draw a Fischer projection for the following compounds.