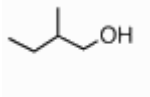
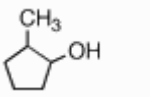
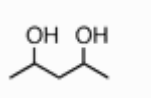
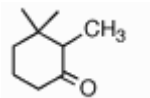
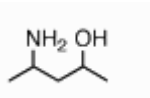


Organic Chemistry (I) Chapter 5

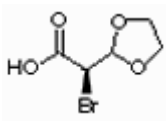
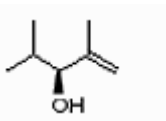
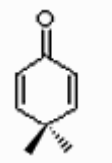
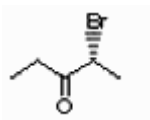
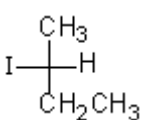
1. Which of the following statements is *most* correct?

- A. Enantiomers are easy to separate from each other.
- B. Diastereomers are easy to separate from each other.
- C. Enantiomers are easier to separate from each other than are diastereomers.
- D. Diastereomers are easier to separate from each other than are enantiomers.
- E. Neither enantiomers nor diastereomers can typically be separated from each other.

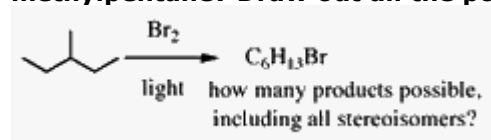
2. Which of the following molecules could exist as a total of three stereoisomers?

- A. 
- B. 
- C. 
- D. 
- E. 

3. Which of the following molecules has a single stereocenter in the *S* configuration?

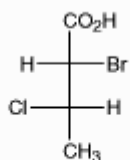
- A. 
- B. 
- C. 
- D. 
- E. 

4. Considering all possible monobromination products (not just major products), how many total products (including all stereoisomers) are possible in the monobromination of 3-methylpentane? Draw out all the possibilities before answering.

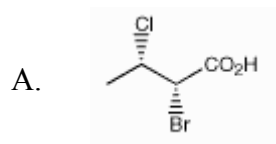


- A. four
- B. seven
- C. five
- D. six
- E. eight

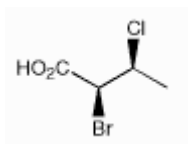
5. Which of the following molecules is the enantiomer of (2S, 3S)-2-Bromo-3-chlorobutanoic acid?



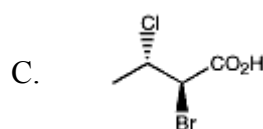
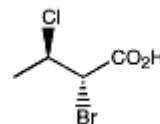
(2S, 3S)-2-Bromo-3-chlorobutanoic acid



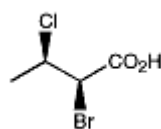
B.



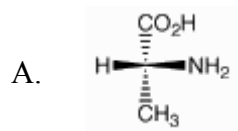
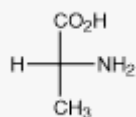
E.



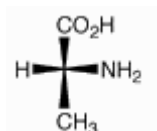
D.



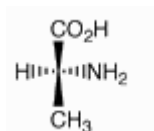
6. The following Fischer projection corresponds to which stereochemistry?



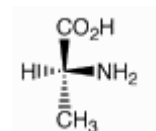
B.



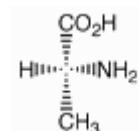
C.



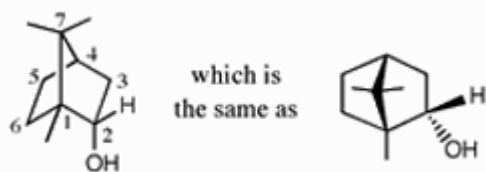
D.



E.



7. Identify all the chiral centers in borneol (1,7,7-trimethylbicyclo[2.2.1]heptan-2-ol). How many are there? The carbons of the bicyclic structure are numbered.



A. one

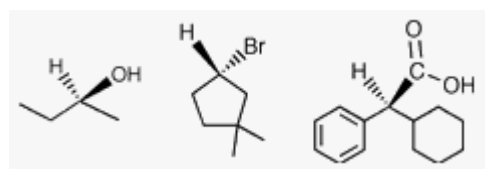
B. four

C. two

D. three

E. five

8. Assign an (R)-(S) stereochemistry to each of the following molecules.



A. S, S, S D. S, S, R C. S, R, S

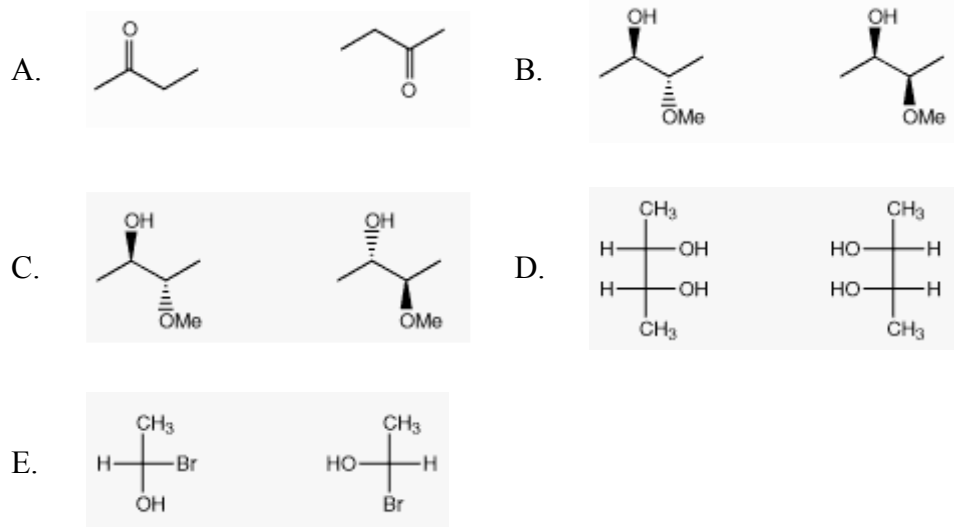
B. R, S, S E. S, R, R

9. Assume you were dealing with a very symmetrical compound that contained three chiral centers. All the possible combinations of *R-S* configurations at the three centers are shown below. Which of these could be meso compounds?

Entry	Stereo-isomer	Mirror-image
1	<i>RRR</i>	<i>SSS</i>
2	<i>RRS</i>	<i>SSR</i>
3	<i>RSR</i>	<i>SRS</i>
4	<i>RSS</i>	<i>SRR</i>

- A. Entries 1 and 3 could be meso compounds.
 B. Entries 2 and 4 could be meso compounds.
 C. Entries 1 and 2 could be meso compounds.
 D. Entries 3 and 4 could be meso compounds.
 E. There is no way to determine which might be meso from the information given.

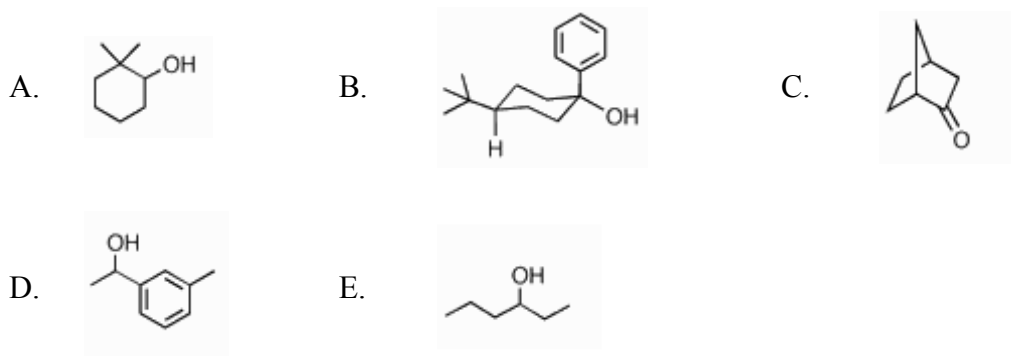
10. Which of the following pairs of molecules represents a pair of enantiomers?



11. Assume that a particular reaction gives the following two enantiomers as products in the following ratio. What is the enantiomeric excess (% ee) associated with this reaction?



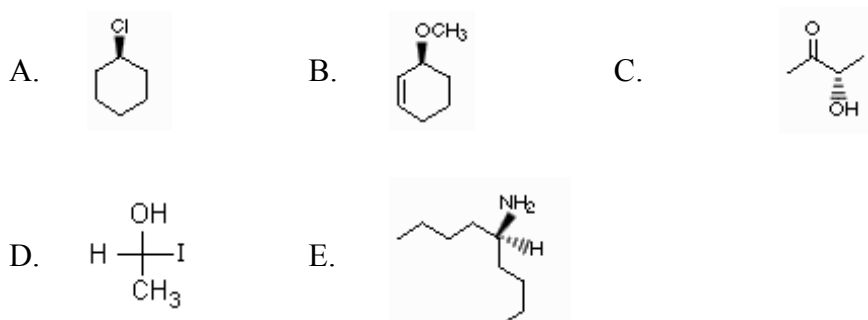
12. Which of the following molecules has a plane of symmetry and is thus achiral (not chiral)?



13. Which of the following is *not* true of optical activity?

- A. Enantiomers have equal magnitudes and opposite signs of optical rotation.
- B. Racemic mixtures exhibit no optical rotation.
- C. Enantiomers are stereoisomers that are nonsuperimposable on their mirror images.
- D. All chiral molecules will exhibit optical rotations.
- E. Neither the sign nor the magnitude of the optical rotation of a new molecule can be predicted in advance.

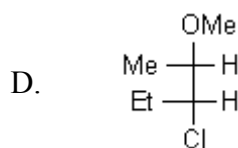
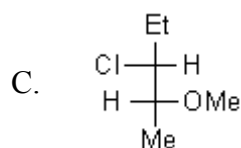
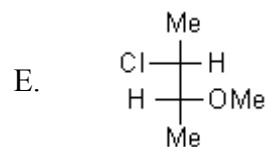
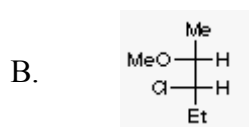
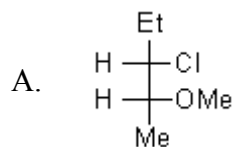
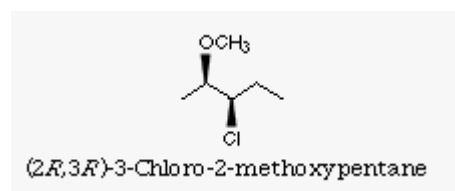
14. Which of the following molecules contains a single stereocenter in the *R* configuration?



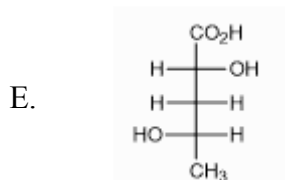
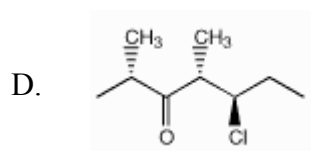
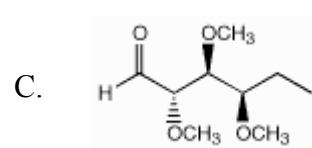
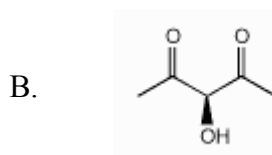
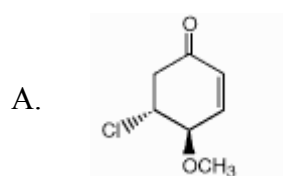
15. During the course of your career as a natural products chemist you isolate a new compound from a plant in South America that has excellent cytotoxic activity against tumor cells. Because you have isolated the compound as a pure enantiomer, you wish to re-report its optical activity. A 0.50-g sample of the compound is placed in 10 mL of ethanol in a sample tube and placed in the polarimeter. The observed optical rotation (α) is measured to be +0.53 degrees. If the length of the sample tube (l) is 10 cm, what is the calculated value for the specific rotation of this new compound?

- A. (+) 1.06
- B. (+) 10.6
- C. (+) 100.6
- D. (+) 0.106
- E. (+) 0.53

16. Indicate which of the following Fischer projections correctly represents (2*R*, 3*R*)-3-Chloro-2-methoxypentane (shown below as a zigzag structure).



17. Which of the following molecules contains three stereocenters?



18. Which of the following molecules is not chiral?

