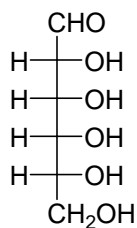


Name \_\_\_\_\_

**If you do not want your graded quiz placed in the box outside my office, then please check here \_\_\_\_\_**

*(1-10) are True or False.*

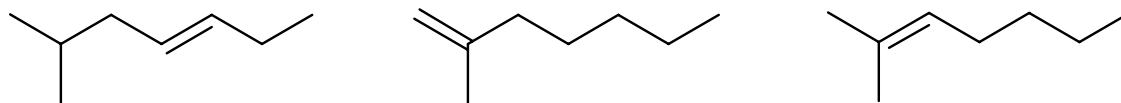
- 1) The mirror image of a chiral molecule is nonsuperimposable upon the original molecule.
- 2) Thermodynamics is related to energy changes which is related to the position of equilibrium (K) for a particular chemical reaction.
- 3) A mixture containing equal amounts of R and S enantiomers is called a *cimecar mixture*.
- 4) A favorable entropy change results from an increase in disorder.
- 5) The lower the bond dissociation energy of a bond, the easier it is to break.
- 6) The *initiation step* of a free radical chain process involves the creation of reactive radical species.
- 7) The E2 reaction gives products of substitution with 100% inversion of stereochemistry.
- 8) This molecule has four chiral centers.



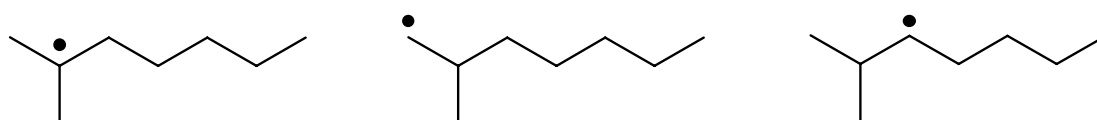
- 9) S<sub>N</sub>1 reactions always proceed with total retention of stereochemistry.
- 10) Gibbs free energy change,  $\Delta G = \Delta S - H\Delta T$

11-14) Circle the more stable species in each threesome.

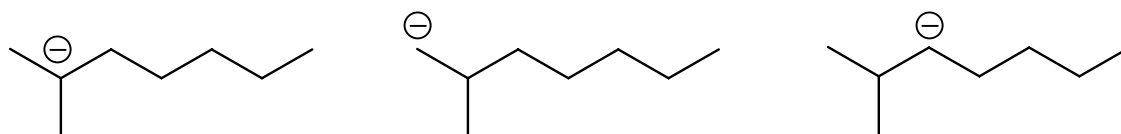
11)



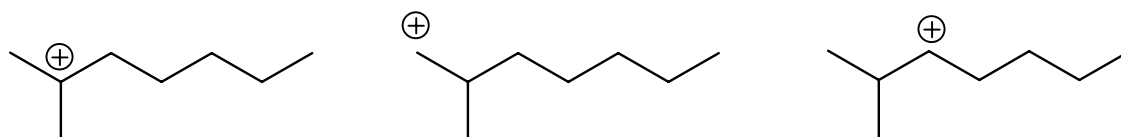
12)



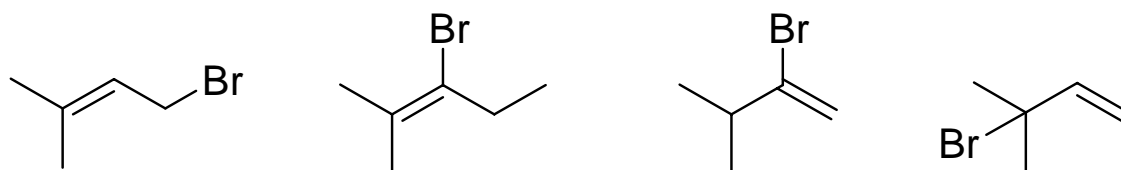
13)



14)



15) Two of these four compounds will ionize with loss of Bromide ion to form the same carbocation. Circle those two compounds.

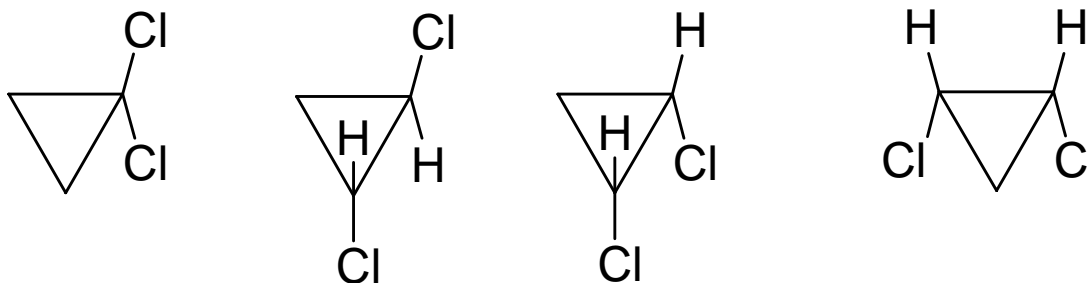


16) For an  $S_N1$  reaction, if the concentration of substrate was doubled, and the concentration of the nucleophile was doubled, how much would the reaction rate increase ?

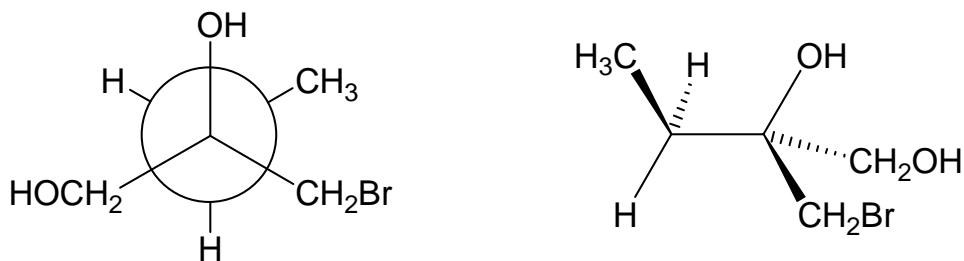
17) What is the Hammond Postulate ?

18-19) How many of these dichlorocyclopropanes are *chiral* ?

How many of these dichlorocyclopropanes are *meso* ?



20) Are these two compounds related as being *enantiomers*, *same* or *diastereomers* ?



**\*BONUS QUESTION for 1 extra point\***

What are the advantages of knowing and understanding the mechanism by which a particular reaction proceeds ?

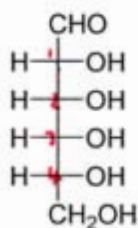
Name

MACK A. NISMS

If you do not want your graded quiz placed in the box outside my office, then please check here \_\_\_\_\_

(1-10) are True or False.

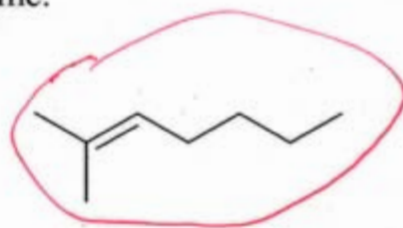
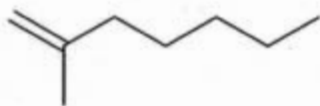
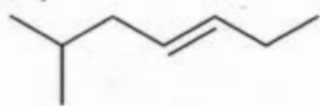
- 1) The mirror image of a chiral molecule is nonsuperimposable upon the original molecule. T
- 2) Thermodynamics is related to energy changes which is related to the position of equilibrium (K) for a particular chemical reaction. T
- 3) A mixture containing equal amounts of R and S enantiomers is called a *cimecar mixture*. F
- 4) A favorable entropy change results from an increase in disorder. T
- 5) The lower the bond dissociation energy of a bond, the easier it is to break. T
- 6) The *initiation step* of a free radical chain process involves the creation of reactive radical species. T
- 7) The E2 reaction gives products of substitution with 100% inversion of stereochemistry. F
- 8) This molecule has four chiral centers.



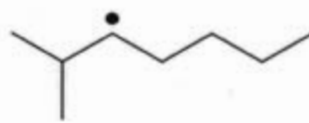
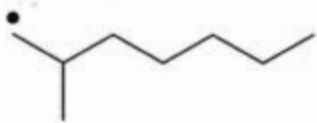
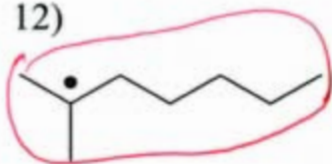
- 9)  $S_N1$  reactions always proceed with total retention of stereochemistry. F
- 10) Gibbs free energy change,  $\Delta G = \Delta S - H\Delta T$  F

11-14) Circle the more stable species in each threesome.

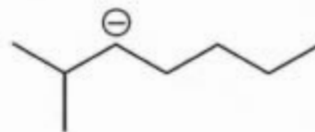
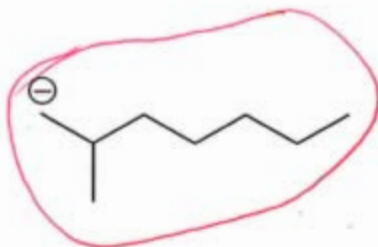
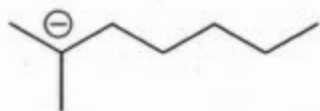
11)



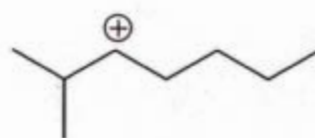
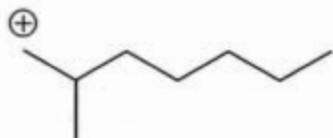
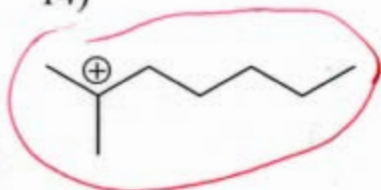
12)



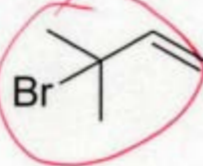
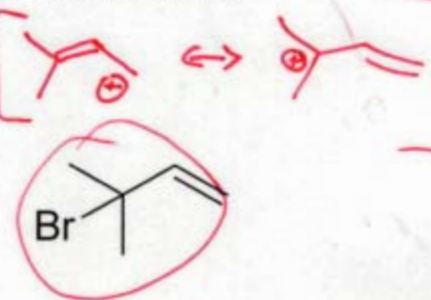
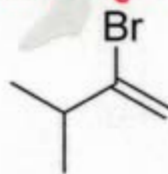
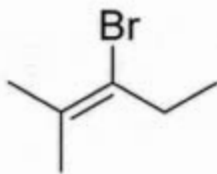
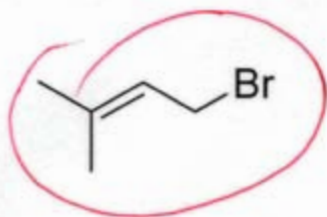
13)



14)



15) Two of these four compounds will ionize with loss of Bromide ion to form the same carbocation. Circle those two compounds.



16) For an  $S_N1$  reaction, if the concentration of substrate was doubled, and the concentration of the nucleophile was doubled, how much would the reaction rate increase?

DOUBLED

17) What is the Hammond Postulate?

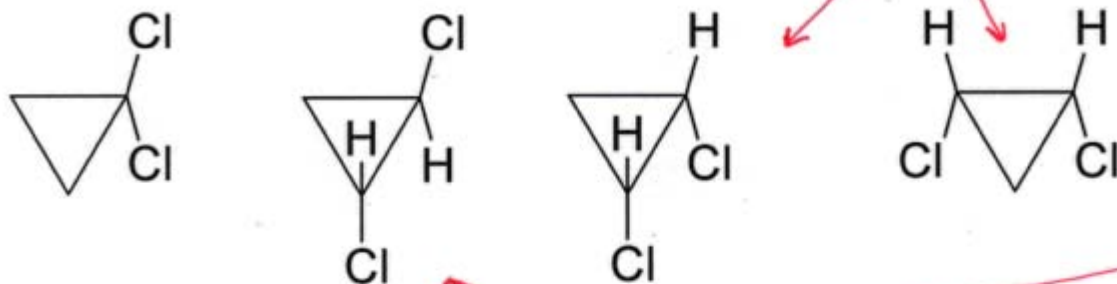
For related processes, species of similar energy, will be of similar structure

18-19) How many of these dichlorocyclopropanes are *chiral*?

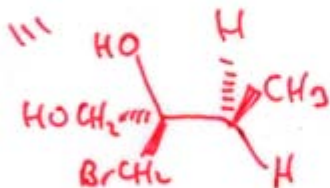
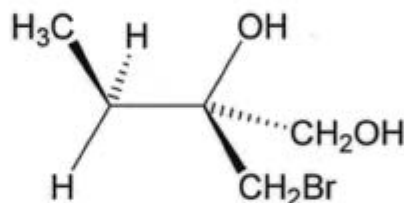
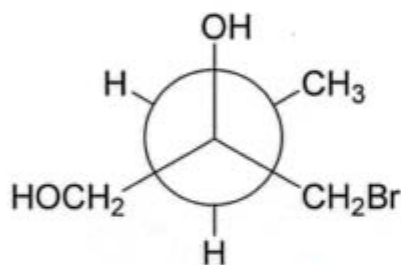
ONE

How many of these dichlorocyclopropanes are *meso*?

TWO



20) Are these two compounds related as being enantiomers, *same* or *diastereomers*?



\*BONUS QUESTION for 1 extra point\*

What are the advantages of knowing and understanding the mechanism by which a particular reaction proceeds?

You can use this to control or manipulate the reaction.

eg. improve yield, control or change the stereochemistry, use different reagents, etc...