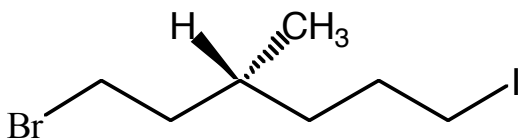


1) Provide an unambiguous name for each of the following molecules. For each structure, indicate whether they are chiral, achiral, or meso by circling the correct description. (21 points)

A)



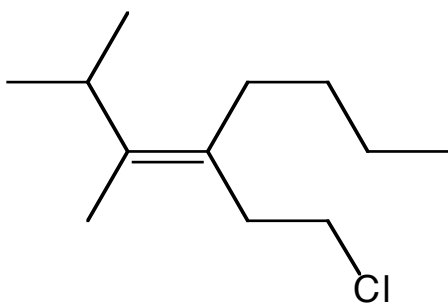
chiral

achiral

meso

(R)-1-Bromo-6-iodo-3-methylhexane

B)



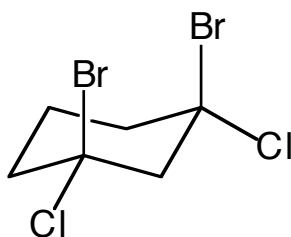
chiral

achiral

meso

(E)-4-(2-chloroethyl)-2,3-dimethyl-3-octene

C)



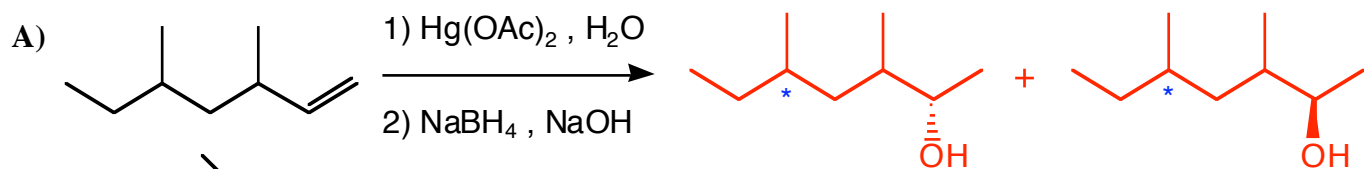
chiral

achiral

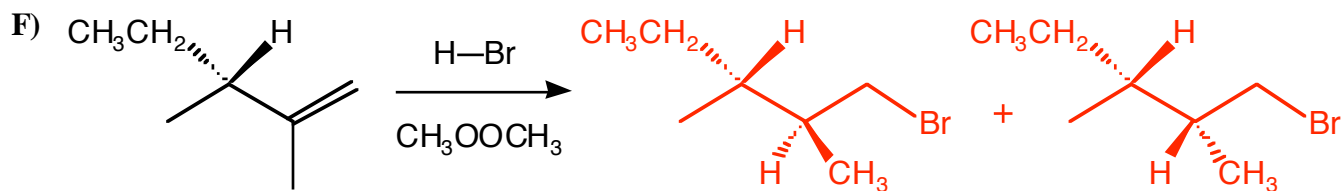
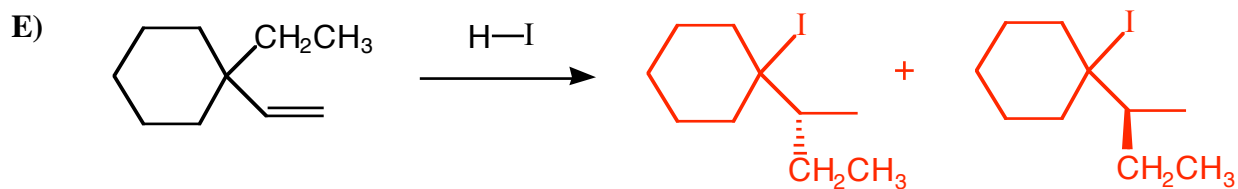
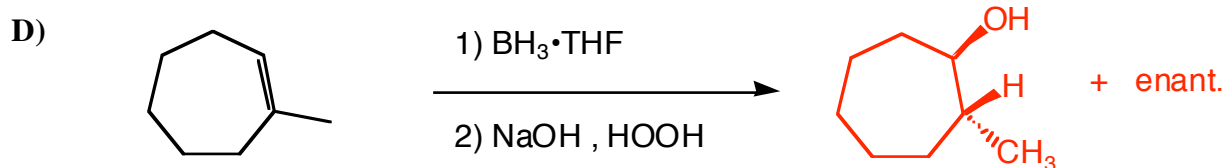
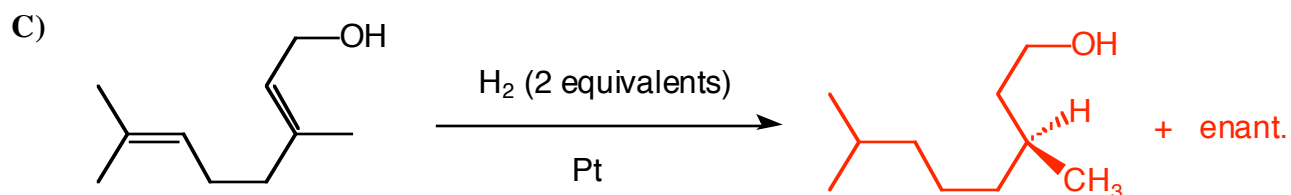
meso

(1R,3S)-1,3-dibromo-1,3-dichlorocyclohexane

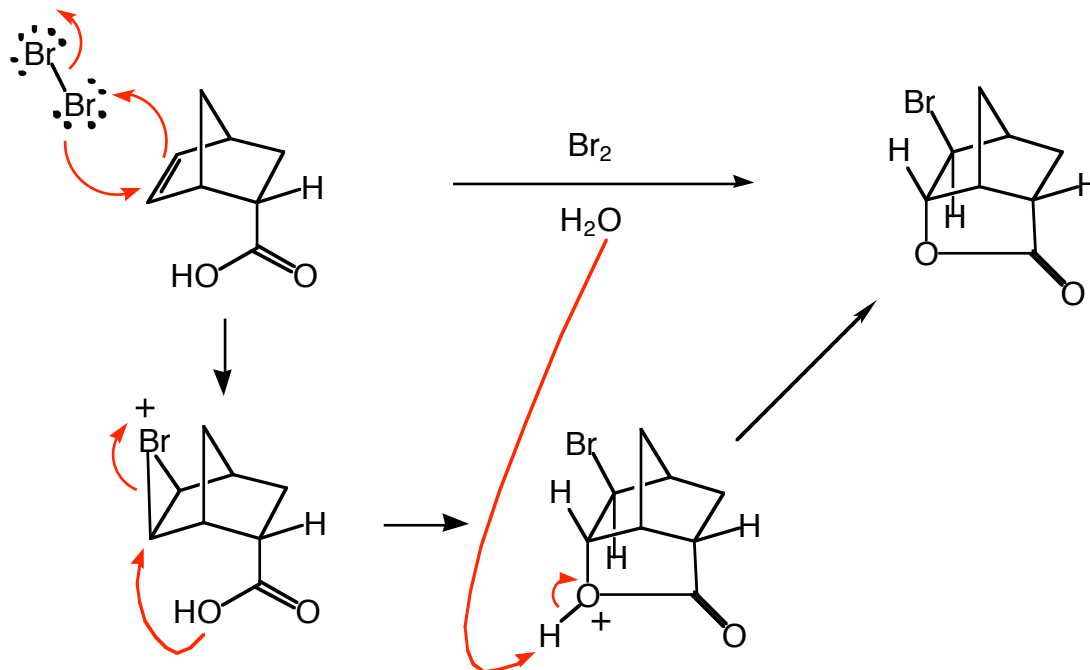
2) Predict the major organic product of each of the following reactions. (36 points)



not enantiomers due to the presence of another stereocenter (*)

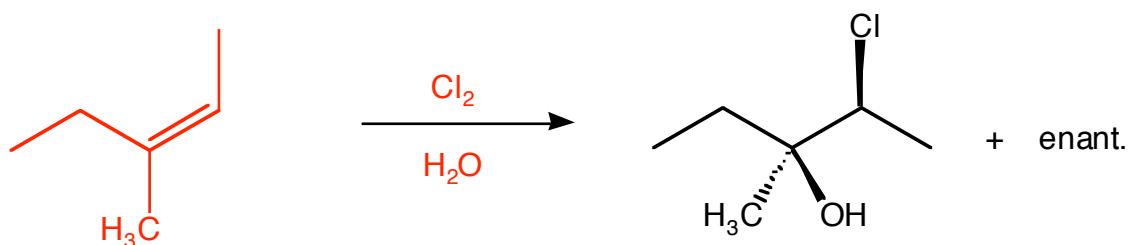


3) Provide a mechanism for the following transformation. For full credit, be sure to show all intermediates and formal charges along the way. (9 points)

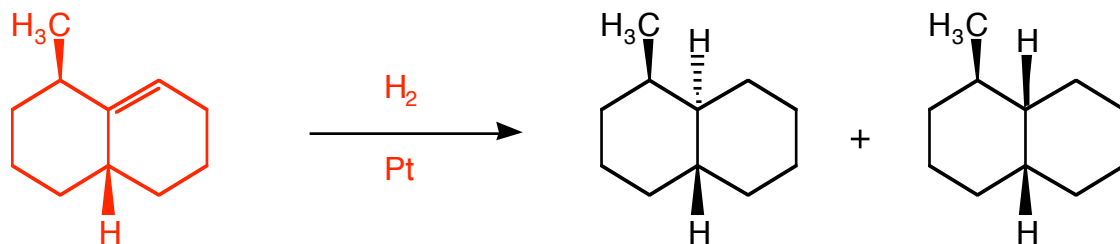


4) Provide the compound and reagents needed to synthesize the following products? (16 points)

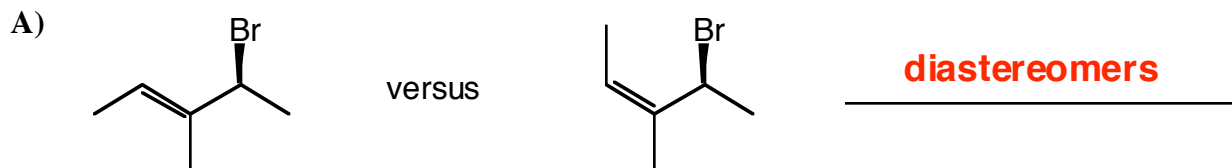
A)



B)



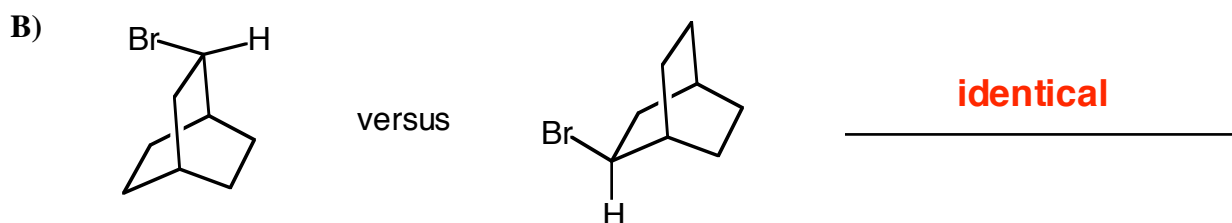
5) Define the relationship between the following pairs of compounds by choosing from the following: enantiomers, diastereomers, identical, constitutional isomers, or nonisomers. Then answer the questions that follow each pair. (18 points)



Will a 50:50 mixture of these two rotate plane polarized light? yes or no

Why or why not?

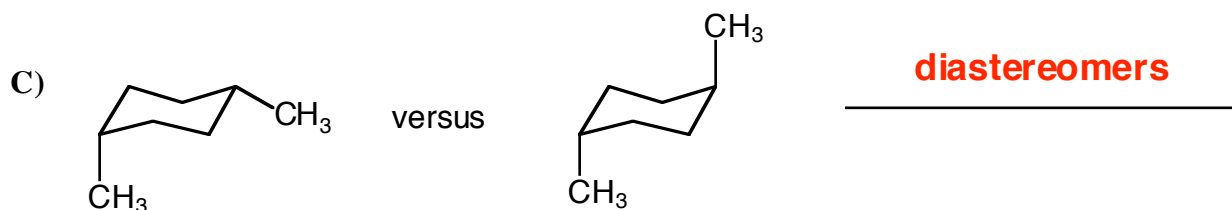
Because they are both chiral molecules and not a racemic mixture. The only instance where they would not rotate plane polarized light is if their optical rotations were exactly opposite (rare for diastereomers).



Will a 50:50 mixture of these two rotate plane polarized light? yes or no

Why or why not?

Because this sample consists of one chiral substance.



Will a 50:50 mixture of these two rotate plane polarized light? yes or no

Why or why not?

Because both molecules are achiral (meso).