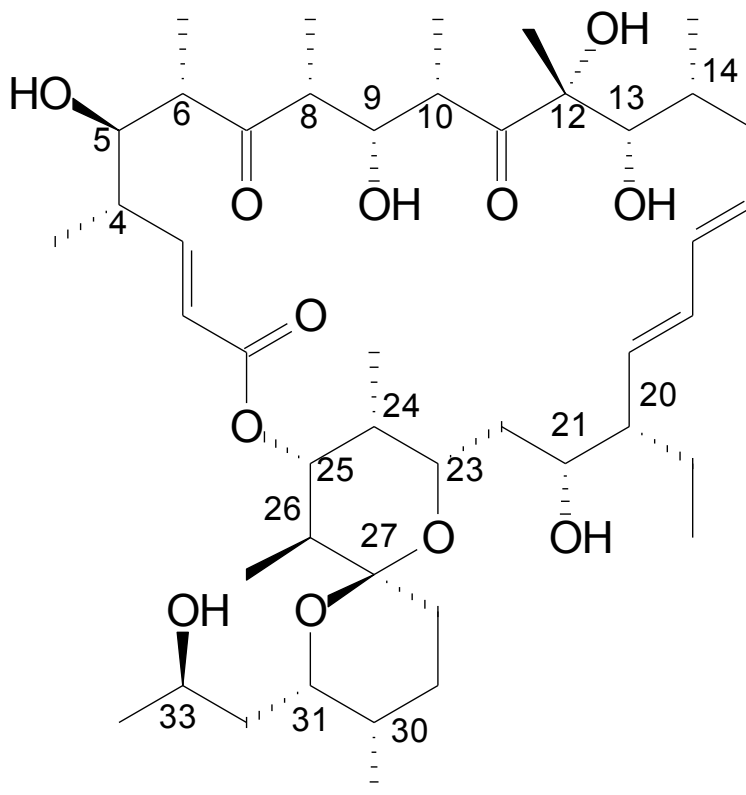


1. (20 pts.) Assign the absolute stereochemistry [(*R*) or (*S*)] of **any 10** chiral centers (**your choice**) in 21-hydroxyoligomycin A. **Do not assign more than 10.**

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4.	5.	6.	8.	9.
10.	12.	13.	14.	20.
21.	23.	24.	25.	26.
27.	30.	31.	33.	

2. Some A values: *i*-Pr = 2.1 kcal/mole; Me = 1.8 kcal/mole; Br = 0.55 kcal/mole

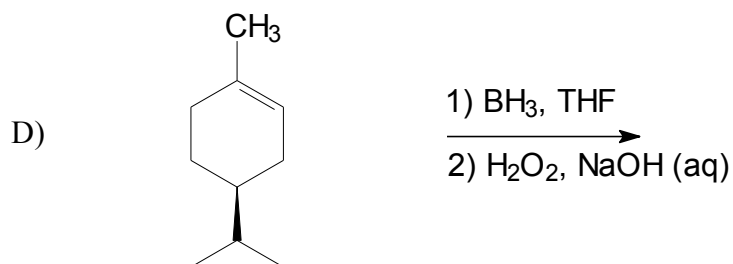
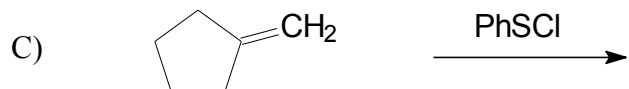
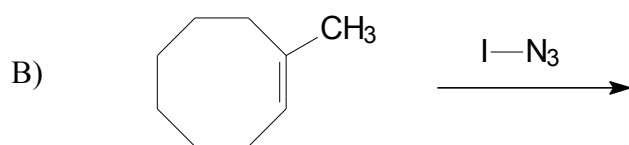
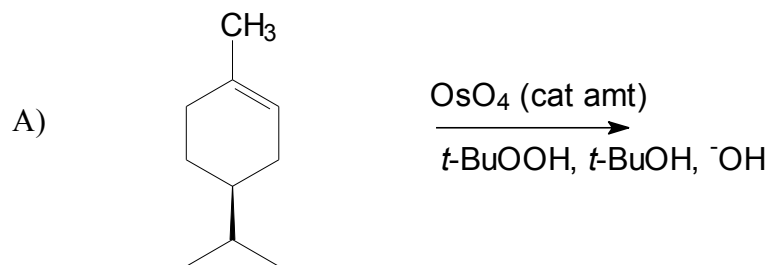
A) (5 pts) Draw the structure of (1*R*,2*S*,4*R*)-2-bromo-4-isopropyl-1-methylcyclohexane. Use wedges and dashes to clearly indicate stereochemistry.

B) (5 pts.) Draw both chair forms of (1*R*,2*S*,4*R*)-2-bromo-4-isopropyl-1-methylcyclohexane. Do not use wedges and dashes when drawing chairs.

C) (5 pts.) Draw the MAJOR E2 product obtained from dehydrohalogenation of (1*R*,2*S*,4*R*)-2-bromo-4-isopropyl-1-methylcyclohexane. Use wedges and dashes to clearly indicate stereochemistry.

D) (5 pts.) Which of the 2 chairs from part B) is the most stable.

3. (20 pts.) Draw the structures of the major organic products formed after each step (where applicable) in the following reactions. Include product stereochemistry (where applicable). Indicate racemic mixtures with the (\pm) symbol. If mixtures of diastereomers are formed, draw all reasonable products.



4. A.) (4 pts) Draw the structure of (3*R*,4*S*)-3-bromo-4-methylhexane. Use wedges and dashes to clearly indicate stereochemistry.

B.) (6 pts) Draw a complete set of Newman Projections for rotation about the C3-C4 bond in (3*R*,4*S*)-3-bromo-4-methylhexane (C3 should be the front carbon).

C.) (5 pts) Draw the structure of the major S_N2 product obtained from reaction of (3*R*,4*S*)-3-bromo-4-methylhexane with sodium azide. Use wedges and dashes to clearly indicate stereochemistry.

C.) (5 pts) Draw the structure of the major E2 product obtained from dehydrohalogenation of (3*R*,4*S*)-3-bromo-4-methylhexane.

5. (20 pts) Propose a step-by-step mechanism which would account for the formation of the products in the reactions below. Draw the structures of all of the intermediates formed in the reaction pathway (including resonance structures). Use arrows to show “pushing” of electrons.

