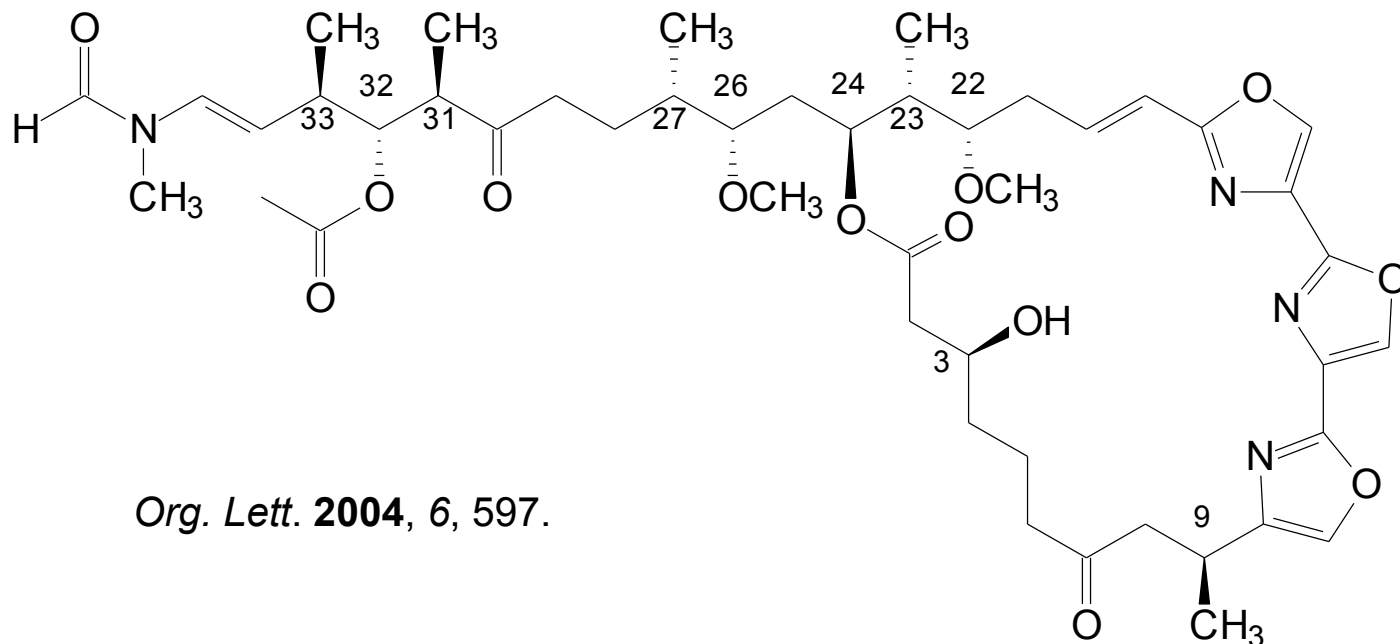


1. (20 pts.) Assign the absolute stereochemistry [(*R*) or (*S*)] of all 10 chiral centers in ulapualide A.



Org. Lett. **2004**, 6, 597.

33.	32.	31.	27.	26.
24.	23.	22.	3.	9.

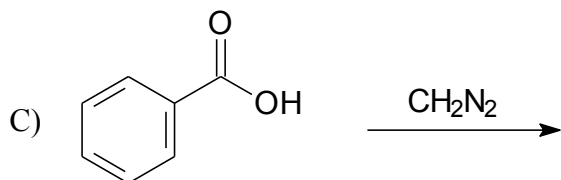
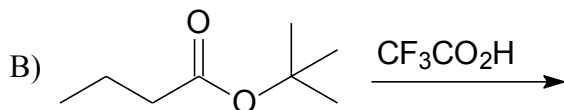
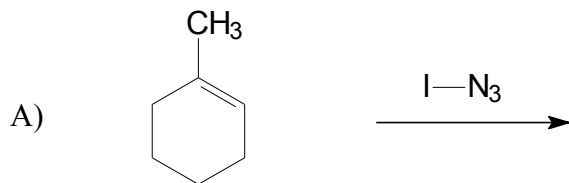
2. Some A values: *i*-Pr = 2.1 kcal/mole; Cl = 0.52 kcal/mole

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

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

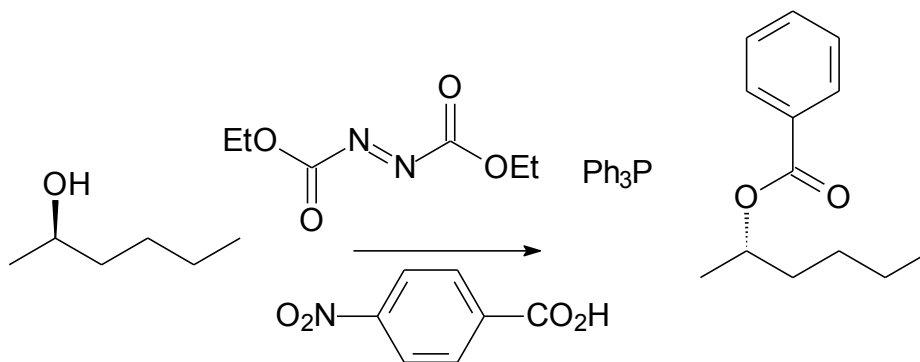
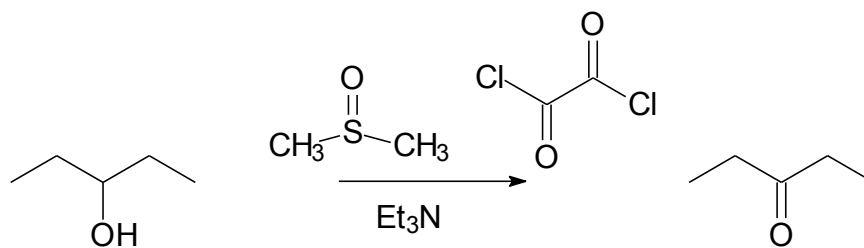
C) (5 pts.) Draw the MAJOR E2 product obtained from dehydrohalogenation of (1*S*,2*R*,4*S*,5*S*)-1,4-dichloro-2,5-diisopropylcyclohexane. Use wedges and dashes to clearly indicate stereochemistry.

3. (15 pts.) **Draw the structures of the major organic products** formed in the following reactions; **and propose a stepwise mechanism** for the reaction. Include product stereochemistry (where applicable). Indicate racemic mixtures with the (\pm) symbol.



EXAM 2 - CHEM 5821 – November 3, 2016 – NAME _____

4. (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.



5. A.) (4 pts) Draw the structure of (3*S*,4*S*)-4-chloro-3-methylheptane. 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*S*,4*S*)-4-chloro-3-methylheptane (C3 should be the front carbon, C4 should be the back carbon).

C.) (5 pts) Draw the structure of the major E2 product obtained from reaction of (3*S*,4*S*)-4-chloro-3-methylheptane with sodium ethoxide in ethanol.

6. (15 pts). Propose a reasonable stepwise mechanism for the following reaction. Draw the structures of all of the intermediates formed (including resonance structures). Use arrows to show "pushing" of electrons.

