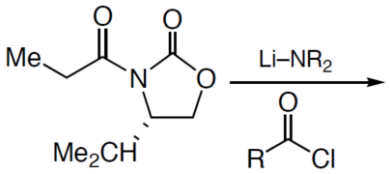
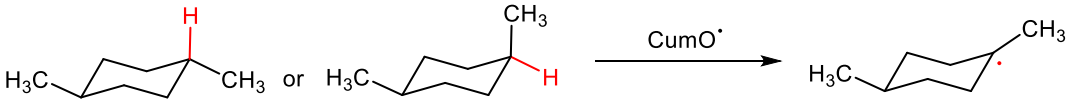
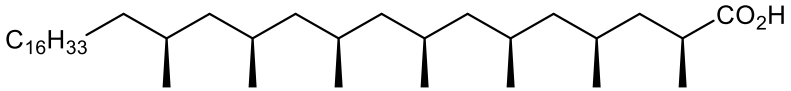
1. What is the prefered diastereomer of the following acylation? Why is the new stereocenter not lost through enolization? *JACS* **1984**, *106*, 1154



2. Which tertiary C-H bond undergoes faster H-atom abstraction by the cumyloxyl radical (CumO•) , the axial or the equatorial one? Rationalize the rate difference. *JOC* **2015**, *80*, 4710



3. Phthioceranic acid seems to be the ideal target for asymmetric alkylations. Propose a synthesis based exclusively on enolate alkylations. What are the major drawbacks of your synthesis? How can you circumvent them? For an actual recent synthesis see *Chem. Eur. J.* **2014**, *20*, 17360



4. The relativ rate of S_N2 reactions of ethyl bromide, *n*-propyl bromide, *i*-butyl bromide and neopentyl bromide is 75000 : 33000 : 3100 : 1. Analyze the likely conformations of the transition states of these S_N2 displacements and rationalize the rate differences.

5. Analyze the conformation of Myers‘ auxiliary (slide 25). Identify unfavorable interactions in other conformers and estimate their relative energy. Which of these conformers would lead to the opposite sense of stereoinduction?