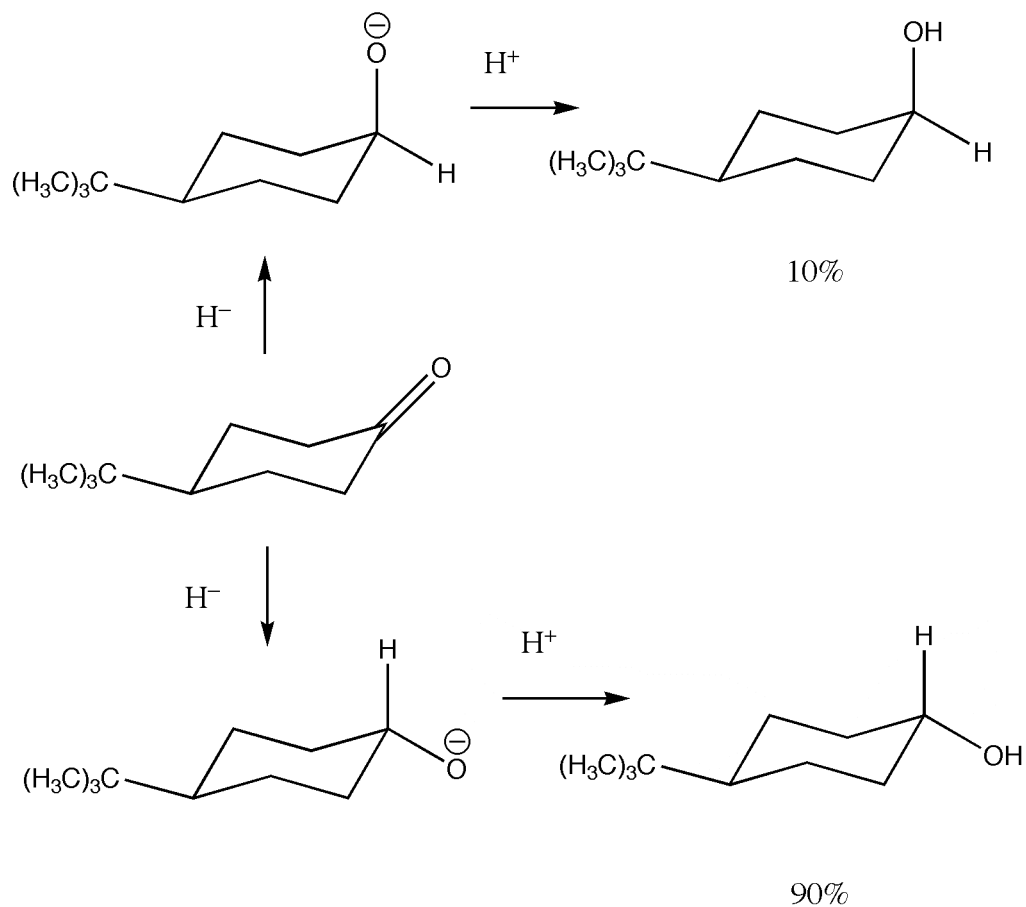


### Exercise 3: Steric stability and stereochemistry

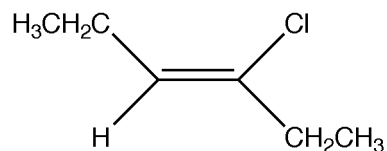
The mechanism of reduction 4-t-butyl-cyclohexanone (the molecule in the middle) into an alcohol is shown below.



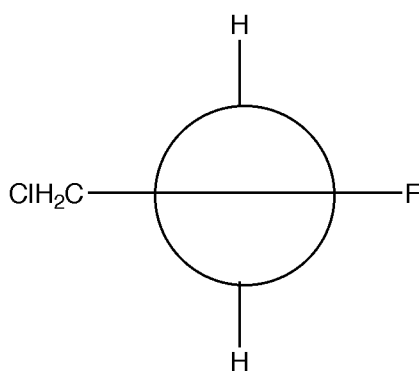
The hydride ion  $\text{H}^-$  can “attack” the ketone either from below (equatorially — the upper pathway) or from above (axially — the lower pathway) the plane of the cyclohexane ring.

1. Explain how this represents a **reduction** of the ketone.
2. The percentage of total product for each product is given. Explain why the lower pathway product is favored by a 9:1 margin over the upper pathway product.

3. Name the following compound using **the E,Z system**.



4. During an exam in my undergraduate organic chemistry class, I encountered this question: "Draw sufficient structure(s) to describe the connectivity and spatial orientation of (Z)-1-chloro-2-fluoropropene."



So I answered by drawing:

Which was apparently not the correct answer (I lost all points on the question).

a. What's wrong with my structure, as drawn?

b. Answer the question correctly below.