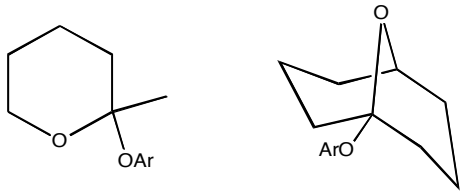
Additional Problems for Conformation/Sterics/Strain

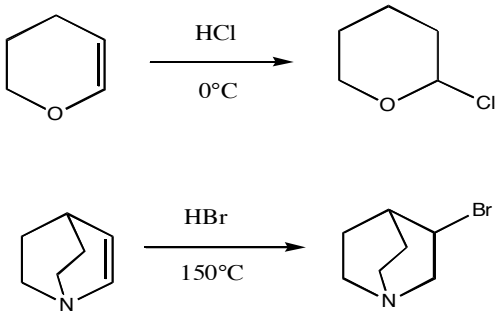
1. The Thorpe-Ingold effect (also called the gem-dimethyl effect) is an effect on reactivity in cyclizations due to geminal methyl groups. Draw the differing conformations of 3,3-dimethylpentane, and predict the lowest energy conformation. Describe what the Thorpe-Ingold effect is.

2. Predict the preferred conformation of fluoromethanol, FCH_2OH around the C-O bond and rationalize your choice.

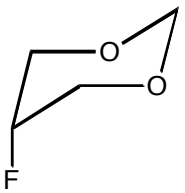
3. One of the following acetals undergoes hydrolysis one trillion times faster than the other. Which is the faster and why?



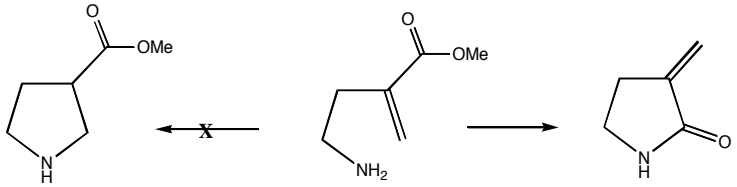
4. Explain the differing regioselectivities in the following reactions:



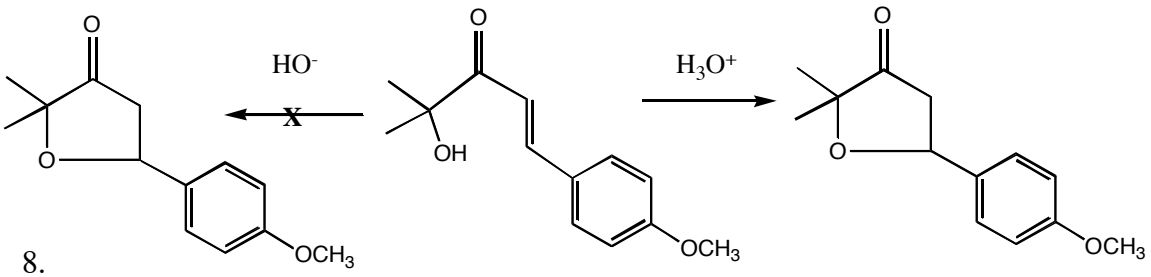
5. Explain why fluorine prefers an axial position in the following 1,4-dioxane:



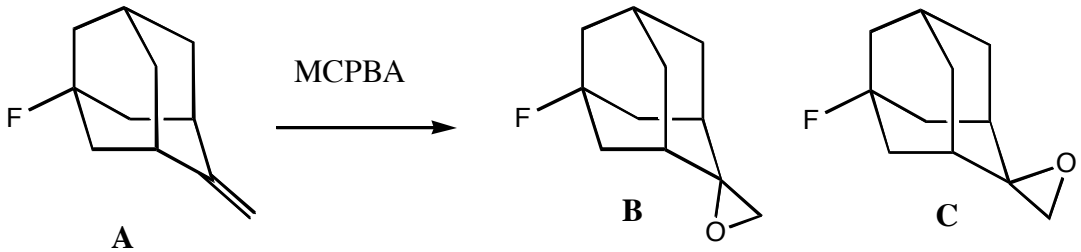
6. Explain why the following amine cyclizes in the manner shown and not via the alternative pathway:



7. Why does the following alcohol undergo cyclization under acidic conditions but not under basic conditions?

8. 

9. Explain the selective formation of epoxide **B** over epoxide **C** upon treatment of **A** with MCPBA:



A **B** major **C** minor