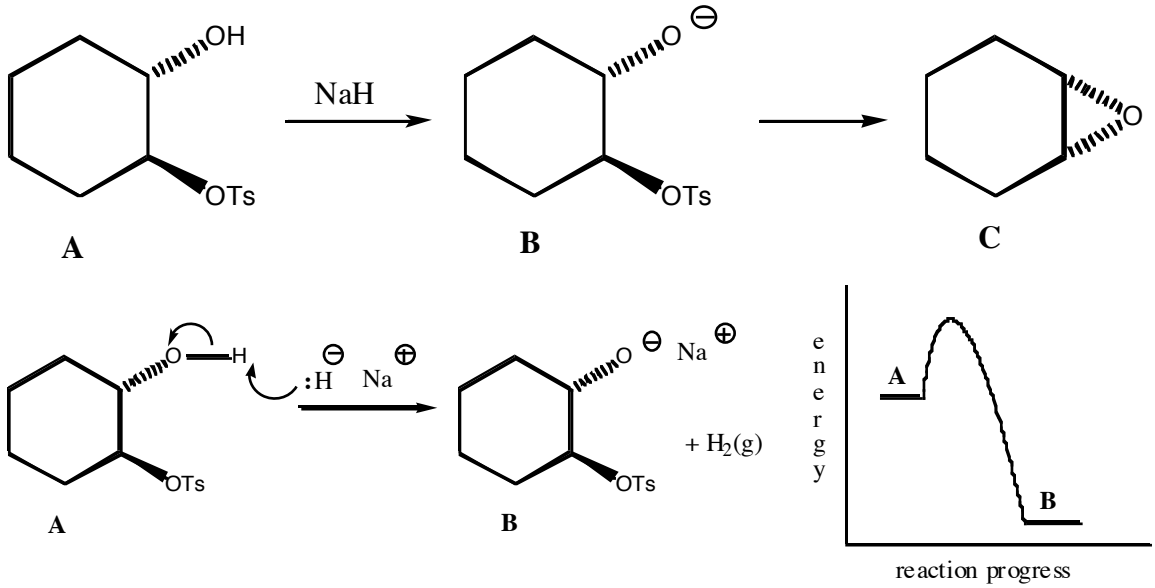
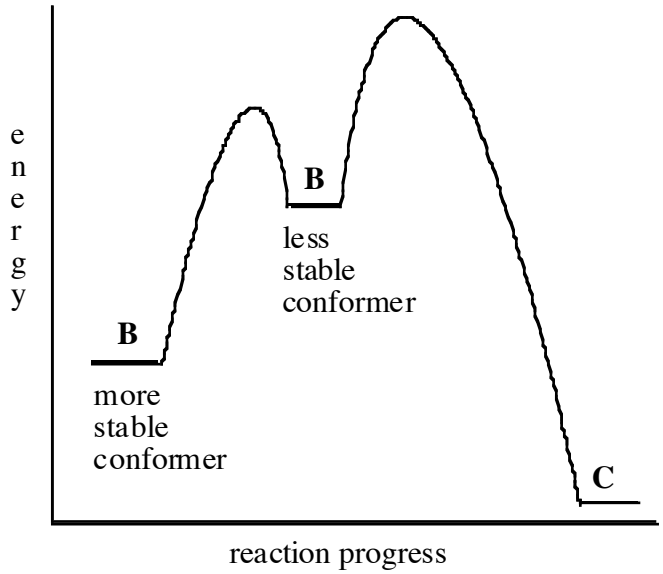
Answers to Problem 65, Chemistry 301X - 2006

(a)



(b)LeChatelier's Principle states that a system at equilibrium responds to stress in such a way as to relieve that stress. In this case, when the gaseous hydrogen is produced, it bubbles out of the reaction flask, thereby depleting the product mixture of one of its components. The equilibrium is therefore driven towards products. If KOH were the deprotonating base for an alcohol, ROH, the alkoxide, (RO^-) would be formed reversibly and there might or might not be very much of it present at equilibrium, depending on the structure of "R".

(c)



(d) As long as some of the higher energy conformer of B is present in equilibrium with the more stable conformer, the reaction will be successful. As the equilibrium is established, the less stable conformer will be converted into the more stable final product C. As the small amount of less stable conformer is depleted, the conformational equilibrium will be reestablished and more of the less stable conformer will be formed. Over time, the more stable conformer B will be converted into C.