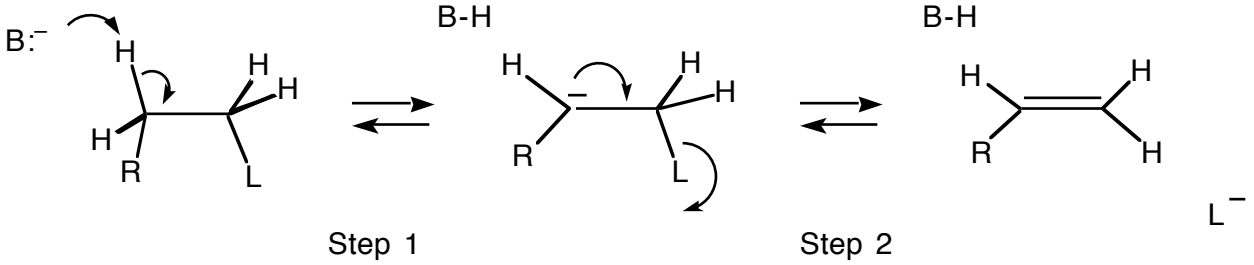
Problem 70, Chemistry 301X - 2006

WATCH OUT - hard one.

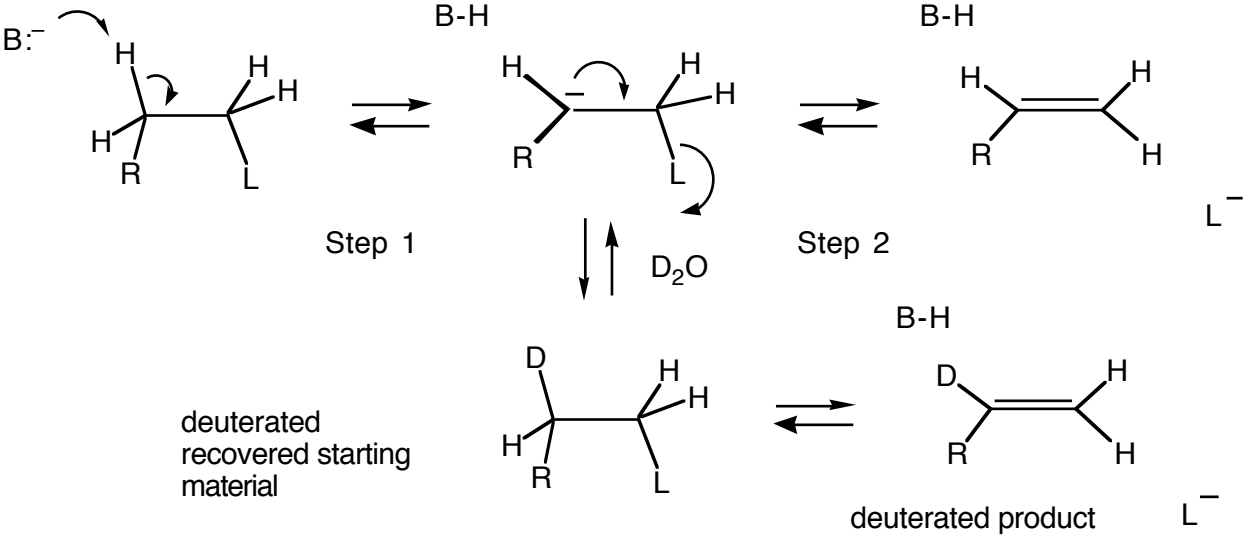
Recall the E1cB reaction. In broad outline the E1cB looks like this:



(a) What specific B, R, and L would make for a good E1cB reaction? First tell us in general for what you are looking, and then make specific suggestions.

(b) Draw an "Energy vs. reaction progress" diagram for this reaction. Oops! There is a decision you have to make in constructing this drawing. You have to decide whether it is Step 1 or Step 2 that is rate determining. As there is no way for you to do this easily, make two drawings, one for the case in which Step 1 is rate determining and a second for the case in which Step 2 is rate determining.

(c) In the olden days, a deuterated solvent was often used as a probe for the E1cB reaction. It was reasoned that if an anion intermediate were involved, deuterium must appear in both the product and recovered starting material.



Is this reasoning correct? Explain why it is or why it is not.