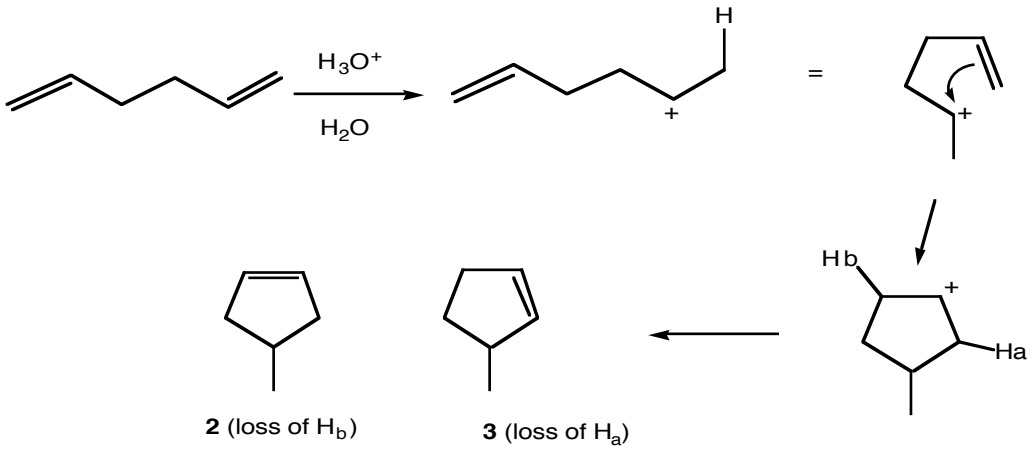
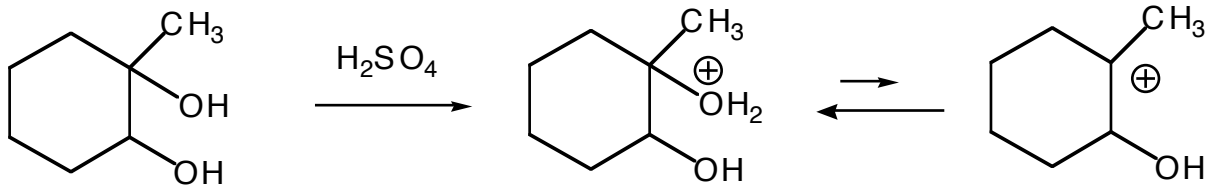
Answers to Problem 85, Chemistry 301X - 2006

(a) Protonation gives the secondary (not primary) carbocation which then adds to the other double bond, again to give the more stable secondary carbocation. There are two different ptotons that can be lost; one gives **2**; the other **3**.

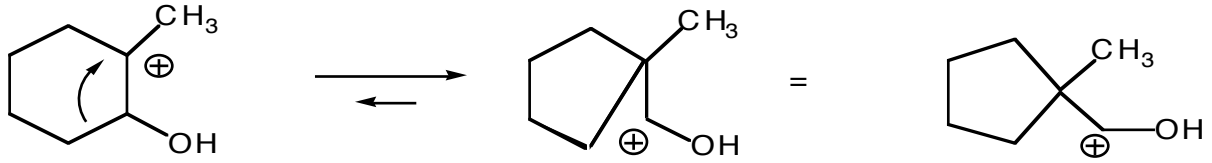


(b)



Note formation of the tertiary carbocation. Protonation of the other OH would lead to the less stable secondary carbocation and this will not be favored.

Now what? You know from the answer that you must make a five-membered ring, so the ring must contract. What happens if it does?



At first, this may seem unfavorable. But then you notice the resonance stabilization, and all is well. A deprotonation leads to the product.