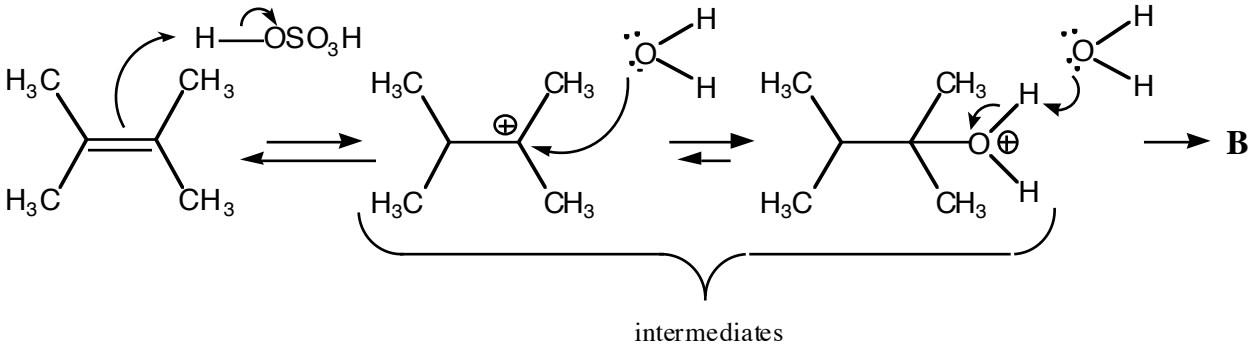
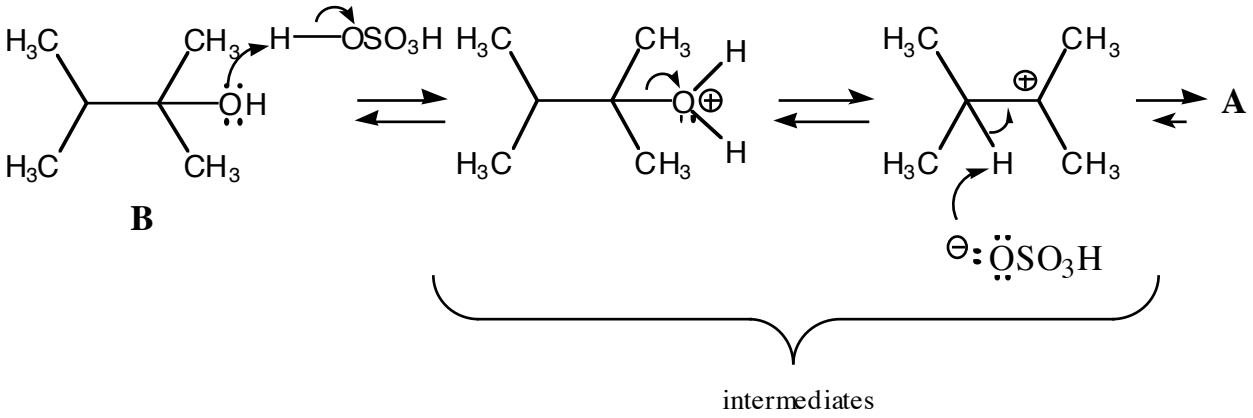
Answers to Problem 67, Chemistry 301X - 2006

a) This reaction is an example of acid-catalyzed H-X (where X=OH) addition to an alkene.



b) This reaction is an example of an E1 elimination. In this case the elimination forms the more substituted alkene, the tetrasubstituted **A**, not the disubstituted alternative.



c) Both reactions have the same intermediates! Mechanism (b) is essentially the reverse of mechanism (a)!! The E1 reaction is essentially the reverse of H-X addition to an alkene!!! If you know one reaction, you know the other!!!!

d) In (a), there is much more water around than there is alkene, so the water is much more likely to trap the carbocation than another molecule of alkene. In (d), there is little water around, so another molecule of alkene is the only Lewis base available to trap the carbocation.