

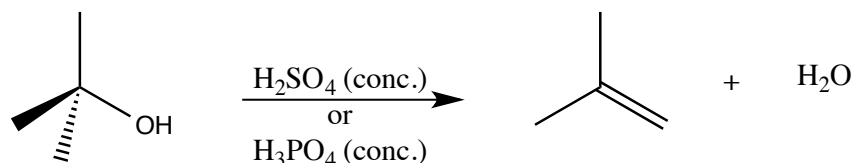
## Chem 343 – Organic Reactions

### Chapter 10

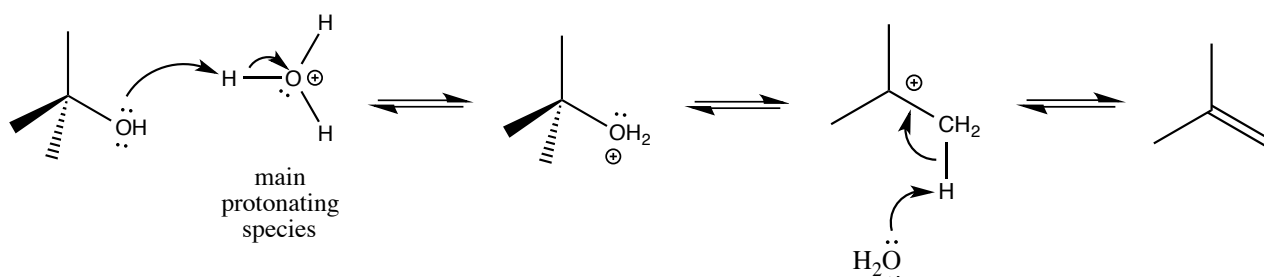
Prepared by José Laboy, MS

<http://www.chem.wisc.edu/areas/clc> (Resource page)

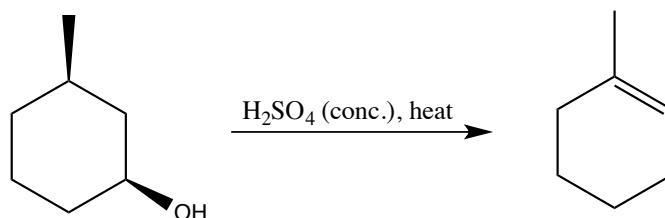
#### Alkenes from Alcohols (Dehydration of an Alcohol by Acid Catalysis)



#### Mechanism



This reaction represents a classic **E1** mechanism. Consequently, the order of reactivity with respect to the alcohol is  $3^\circ > 2^\circ \gg 1^\circ$ . The use of strong acids such as sulfuric or phosphoric in high concentrations increases the alkene yield as well as heating conditions. This reaction is prone to rearrangements (example shown below).



This reaction is run under **thermodynamic conditions**. Under these conditions the alkene major product is the most stable alkene.

To increase the alkene product yield a couple of alternatives are possible. You can distill the alkene product as it's being formed or alternatively use molecular sieves or other media to trap the water formed. Remember that the reverse reaction represents the hydration of an alkene.