

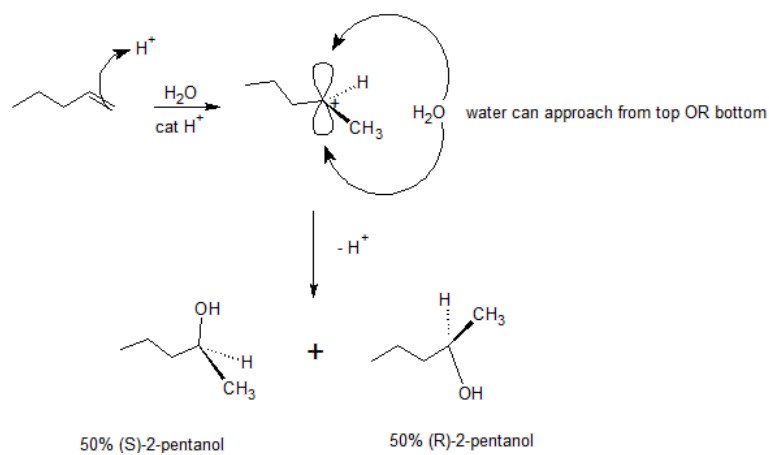
## 9.7: STEREOCHEMISTRY OF REACTIONS - HYDRATION OF ACHIRAL ALKENES

### Learning Objective

- discern the stereochemical differences between the EAR of chiral and achiral alkenes

### STEREOCHEMISTRY AND THE SUBTLE DETAILS

Organic reactions in the laboratory or in living systems can produce chiral centres. Consider reaction of 1-pentene with water (acid catalyzed). Markovnikov regiochemistry occurs and the OH adds to the second carbon. However, both R and S products occur giving a racemic (50/50) mixture of 2-pentanol. How does this occur? The proton addition to 1-pentene results in a planar carbocation intermediate. A molecule of water is then equally likely to react from the top or the bottom of this cation to produce either (S)-2-pentanol or (R)-2-pentanol, respectively, as shown in the mechanism below.



### CONTRIBUTORS AND ATTRIBUTIONS

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