

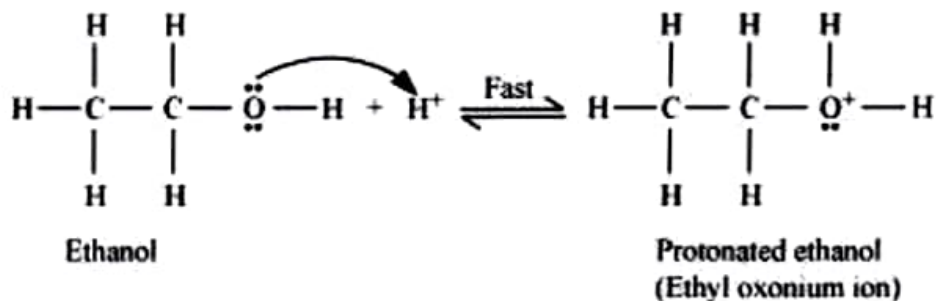
Write the mechanism of acid-catalysed dehydration of ethanol to yield ethene.

Answer

The mechanism of acid dehydration of ethanol to yield ethene involves the following three steps:

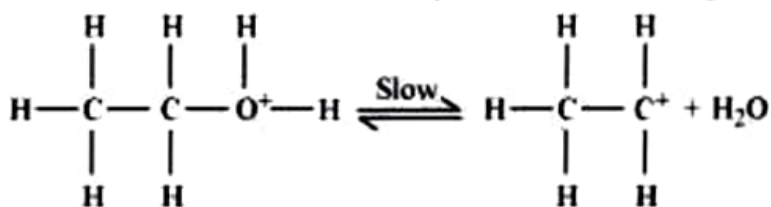
**Step 1:**

Protonation of ethanol to form ethyl oxonium ion:



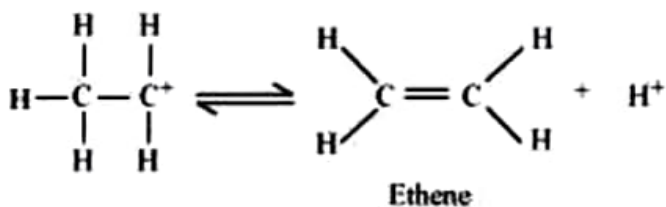
**Step 2:**

Formation of carbocation (rate determining step):



**Step 3:**

Elimination of a proton to form ethene:



The acid consumed in step 1 is released in Step 3. After the formation of ethene, it is removed to shift the equilibrium in a forward direction.