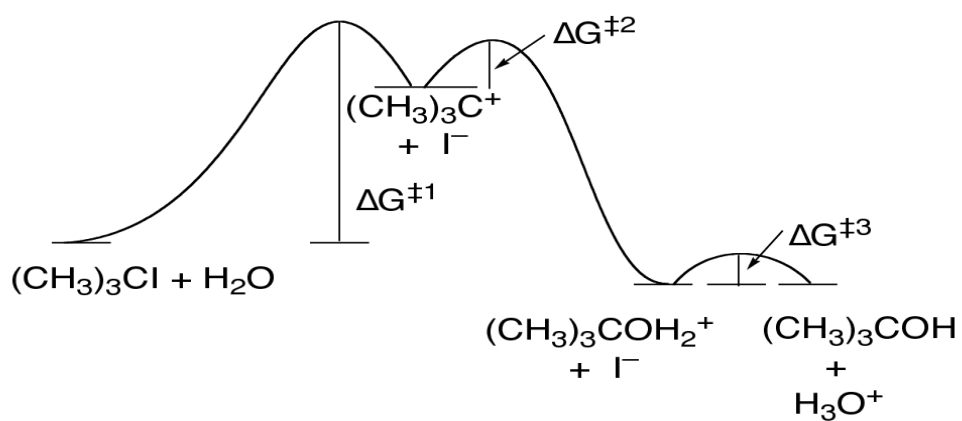


## Energy Diagram for an S<sub>N</sub>1 Reaction



- Step 1            Endothermic, large  $\Delta G^\ddagger$ , rate limiting  
Step 2,3        Exothermic, small  $\Delta G^\ddagger$ , not rate limiting
- Result            Cation disappears as fast as it is formed.
- Reaction cannot go faster than rate limiting step.