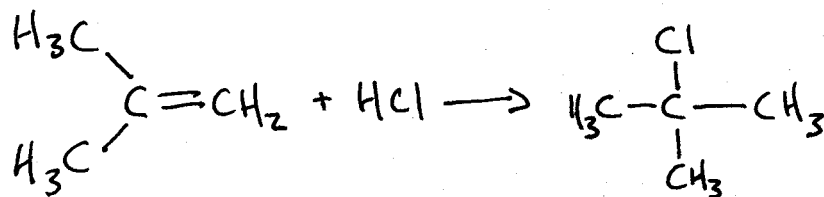
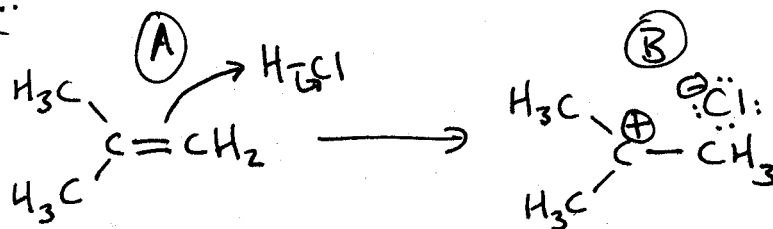


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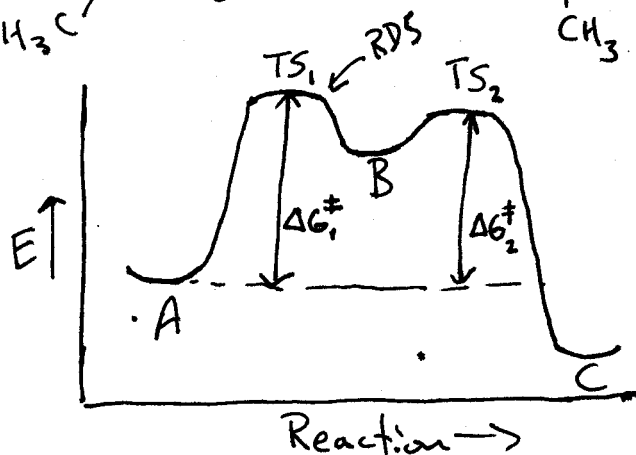
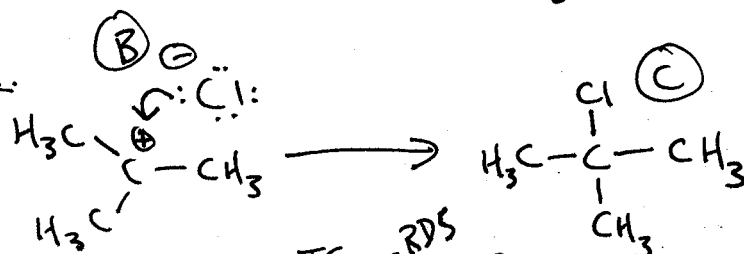
Rxn free Energy Diagrams



Step 1.



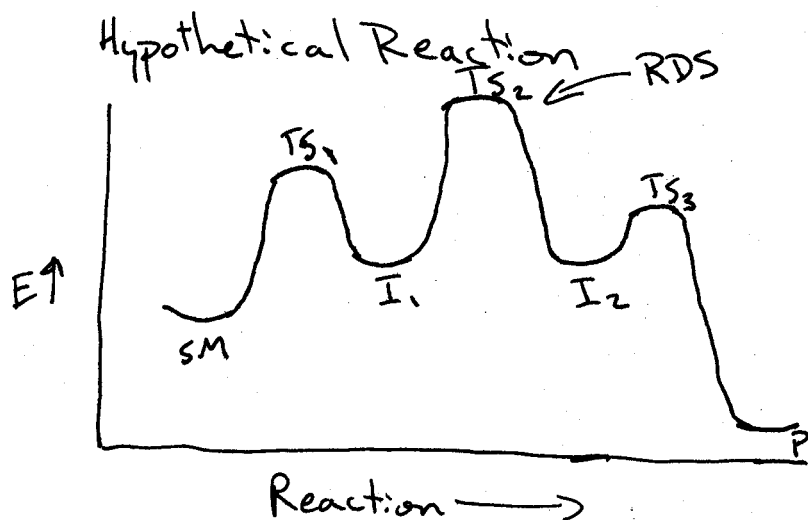
Step 2.



TS = transition state (‡)
Highest energy step is
rate determining step (RDS)

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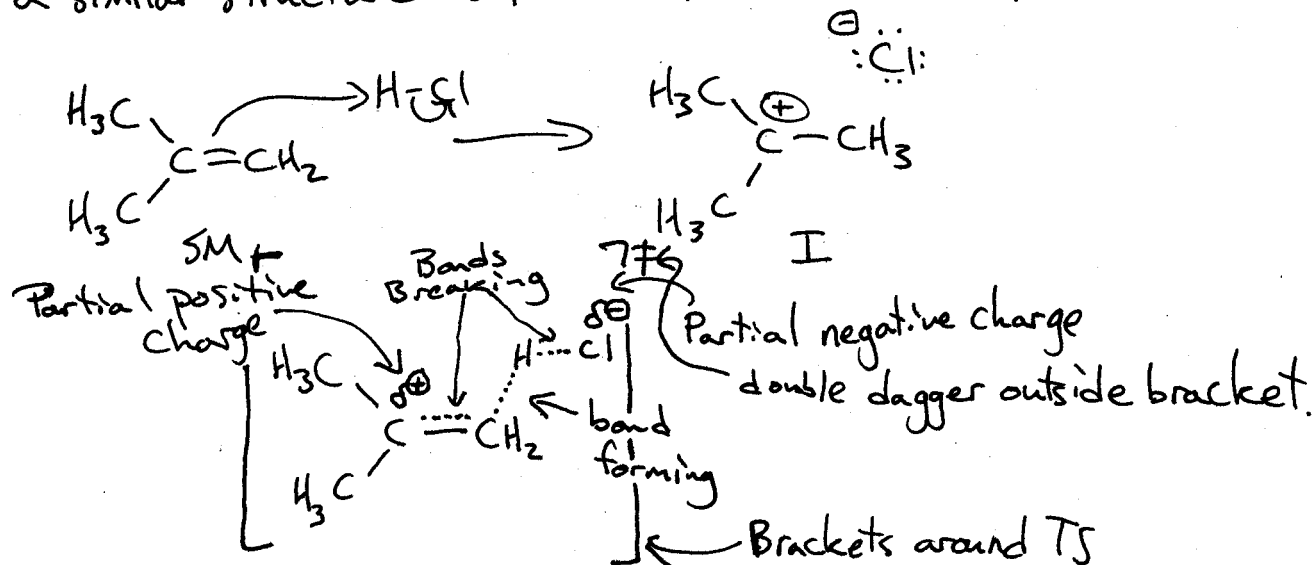
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SM = Starting material
TS = transition state
I = Intermediate
P = Product.

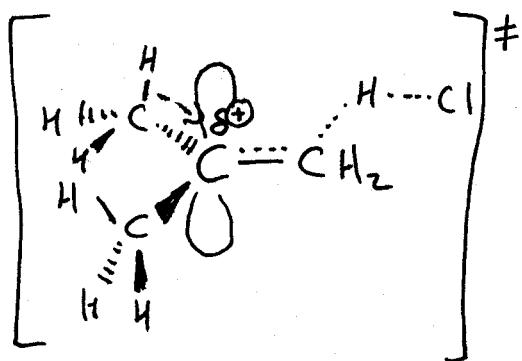
Hammond Postulate:

T.S. that is adjacent to a high energy intermediate will have a similar structure to that of the intermediate.

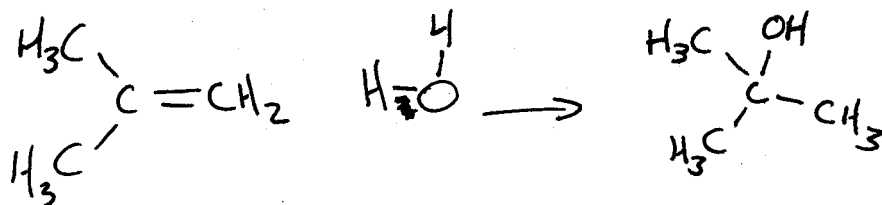


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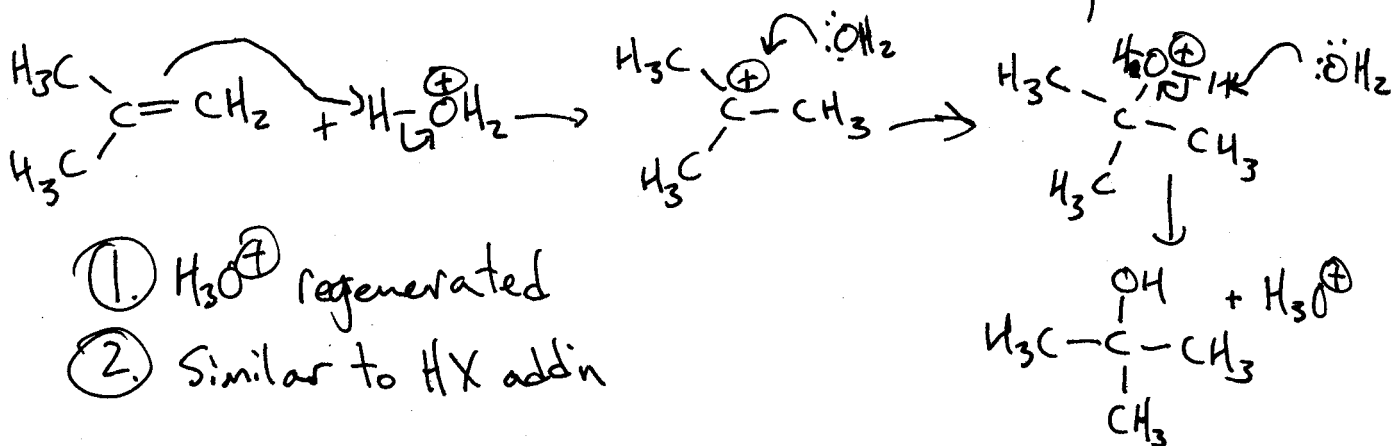
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hyperconjugation also helps stabilize partial positive charge in TS

Catalyst: $\Delta E_a \leftarrow$ activation energySpecies that decreases $\Delta G^\ddagger$ for a process, but is not consumed in the reaction.Acid catalysis of alkene hydration: adding H_2O to a double bond.

very slow reaction. Add acid to speed it up.

① H_3O^+ regenerated② Similar to HX addn

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③ $pK_a H_3O^+ \approx -2$

$pK_a H_2O \approx 16$

④ All steps are reversible

