## **CONCEPT:** GIBBS FREE ENERGY

□ Predicts \_\_\_\_\_\_ of reactions. Composed of three terms.

 $\Delta G^{\circ} = \Delta H^{\circ} - T\Delta S$ 

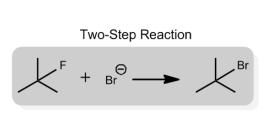
ullet Enthalpy  $\Delta H^{\circ}$  is the sum of bond dissociation energies for the reaction.

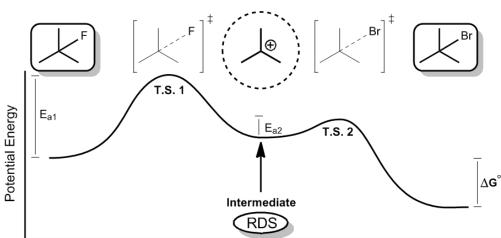
\_\_\_\_ = \_\_\_\_ bonds = Exothermic \_\_\_\_ = \_\_\_ bonds = Endothermic

• **Entropy**  $\Delta S$  is a measure of disorder in the system.

\_\_\_\_ = More ordered \_\_\_\_ = More disordered

- Temperature T amplifies the effect of entropy on the overall favorability.
- $\Box$  Some reactions require more than one step to go to completion. The  $\Delta G^o$  is the sum of all the steps.
  - Transition states \_\_\_\_\_\_ be isolated. They involve bonds being broken and made at the same time.
  - Intermediates \_\_\_\_\_ be isolated. They rest at a higher energy state than normal.





Reaction Coordinate