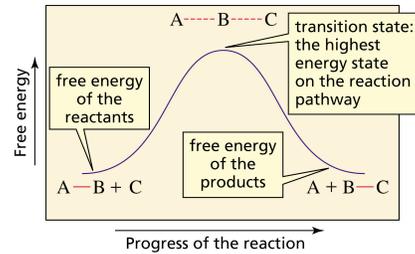


## Energy Diagrams I

Dr. Rusay  
Fall 2004

## A Reaction Coordinate Diagram



## Thermodynamic Quantities

$$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ \quad \Delta E = q + w$$

$$\Delta G, \Delta H, \Delta S, \Delta E \text{ are state functions} \quad \Delta H = q_p$$

Gibbs standard free energy change ( $\Delta G^\circ$ )

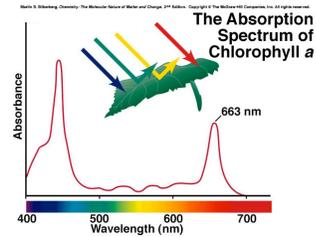
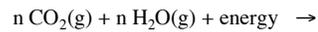
Enthalpy ( $\Delta H^\circ$ ): the heat given off or absorbed during a reaction

Entropy ( $\Delta S^\circ$ ): a measure of freedom of motion

If  $\Delta S^\circ$  is small compared to  $\Delta H^\circ$ ,  $\Delta G^\circ \sim \Delta H^\circ$

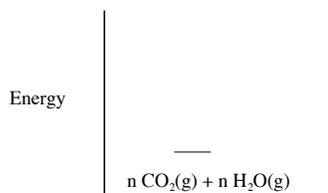
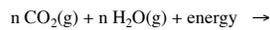
## Example: Photosynthesis

Energy Capture (Endergonic Reaction)



## Photosynthesis

Energy Capture (Endergonic Reaction)



## Photosynthesis

Energy Capture (Endergonic Reaction)

