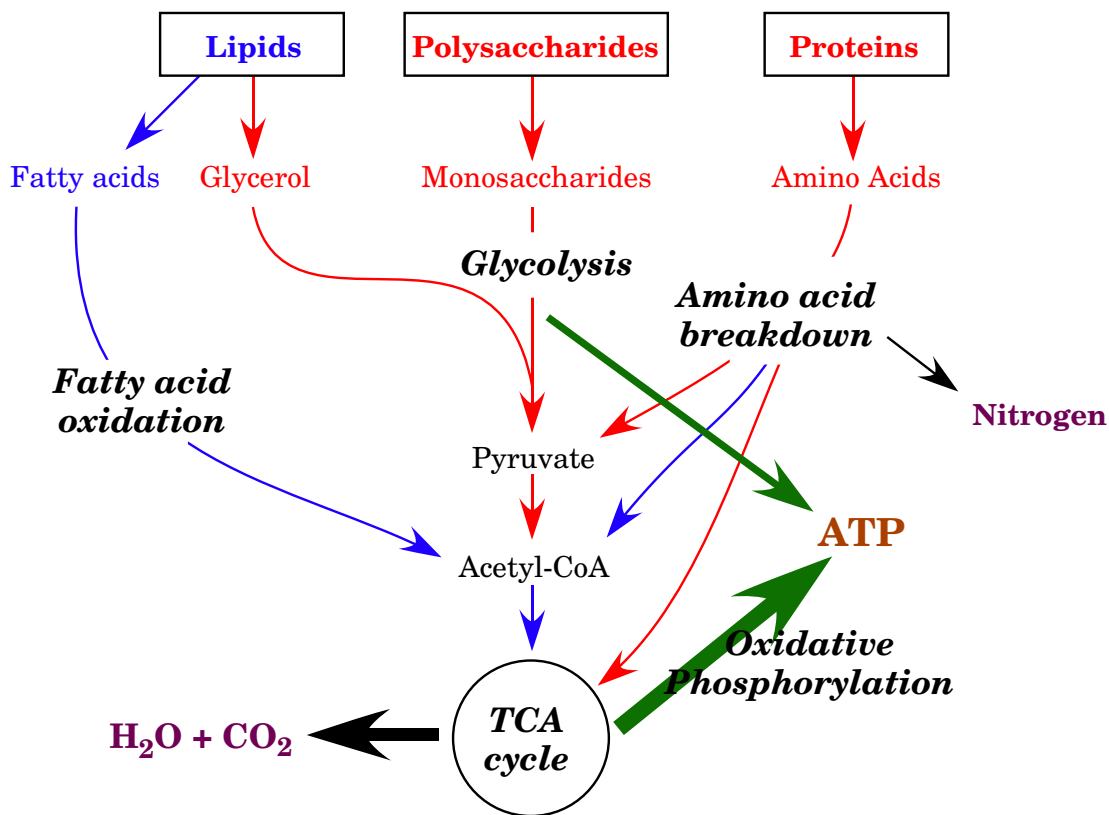
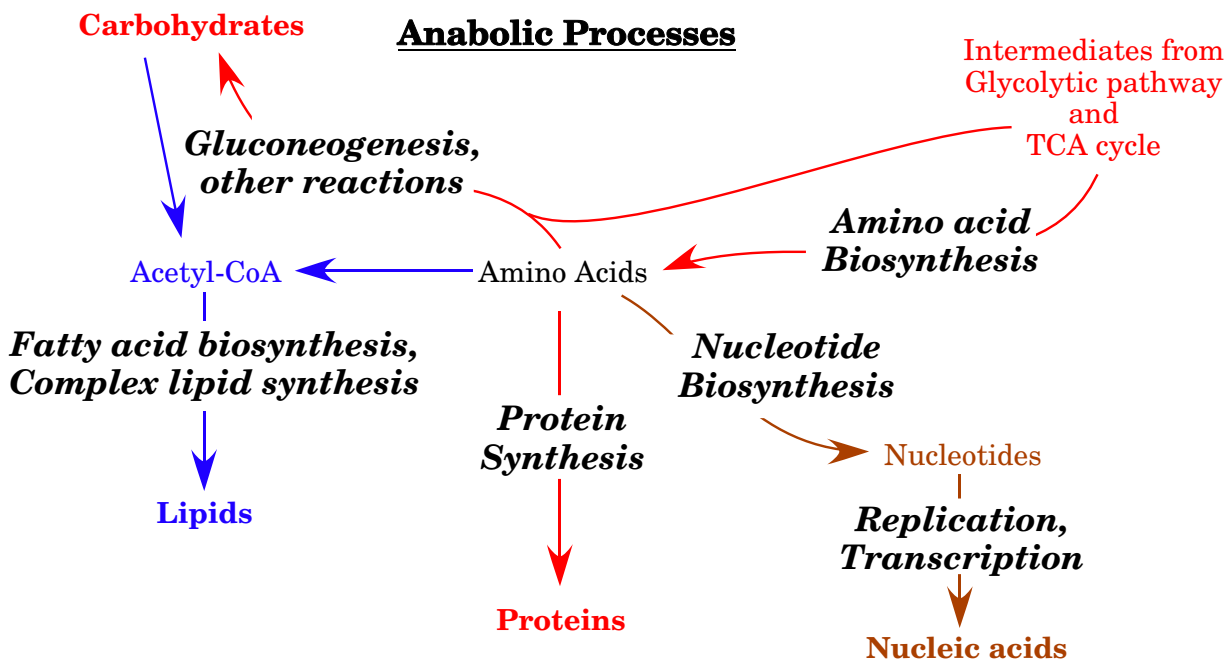


Catabolic Processes



Anabolic Processes

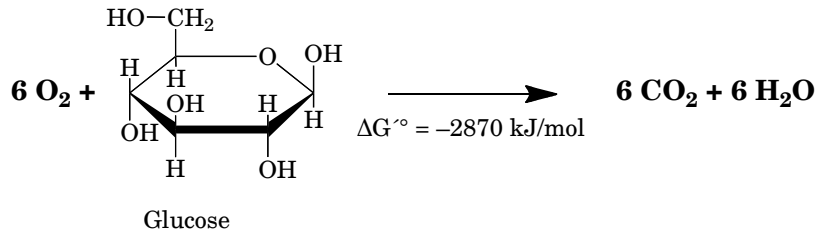


Organisms

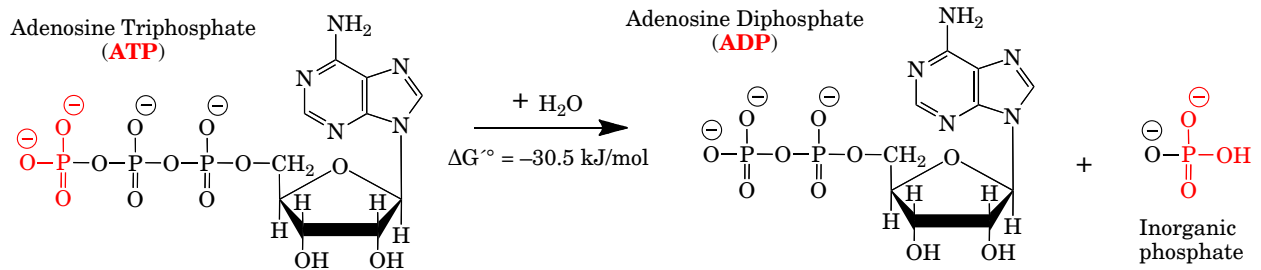
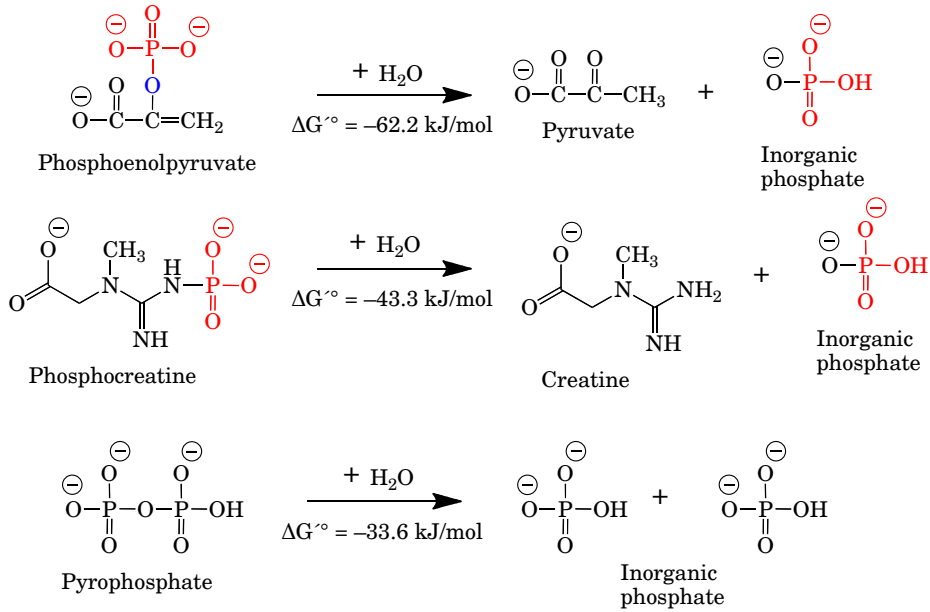
Equilibrium

Homeostasis

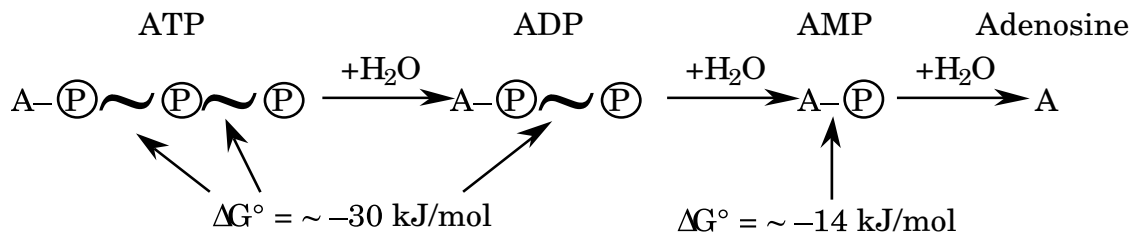
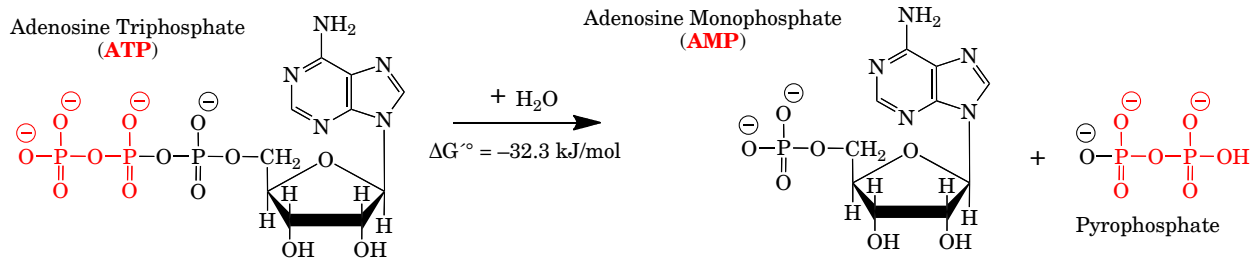
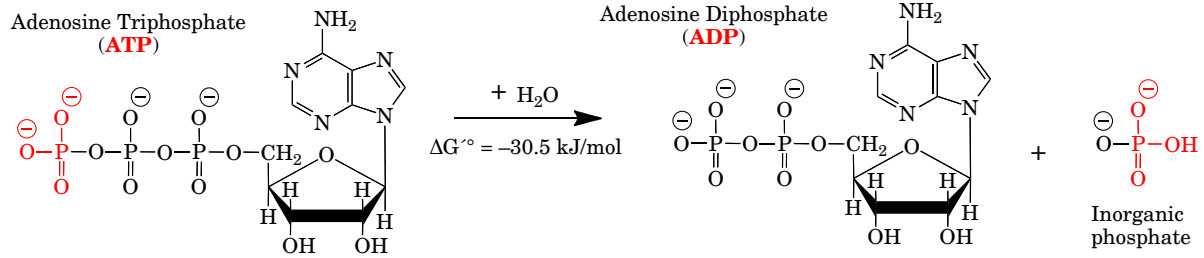
Bioenergetics



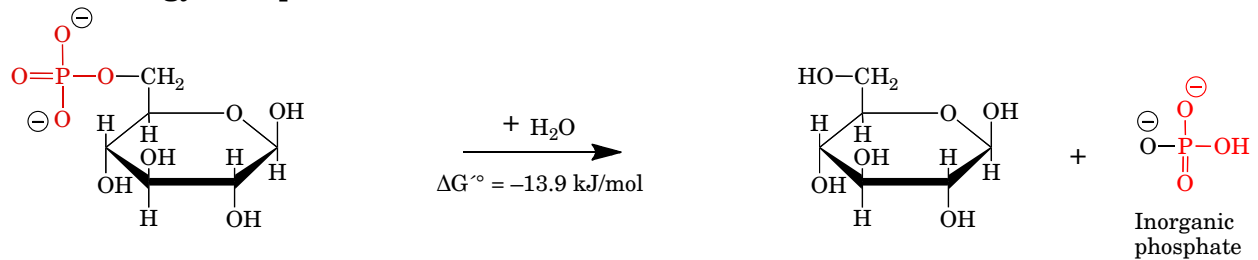
Energetic Molecules



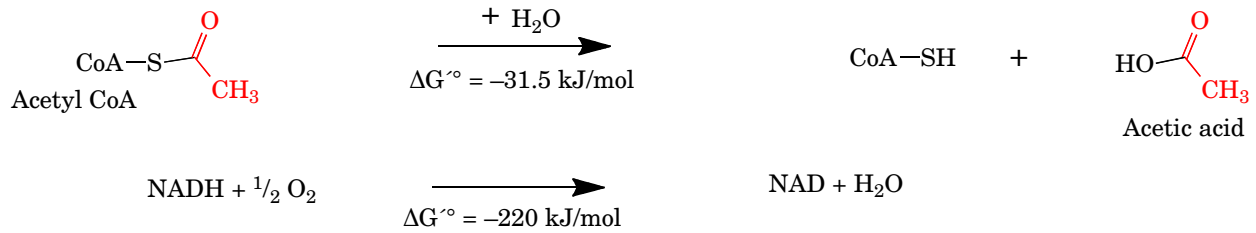
ATP and “High Energy Phosphate”



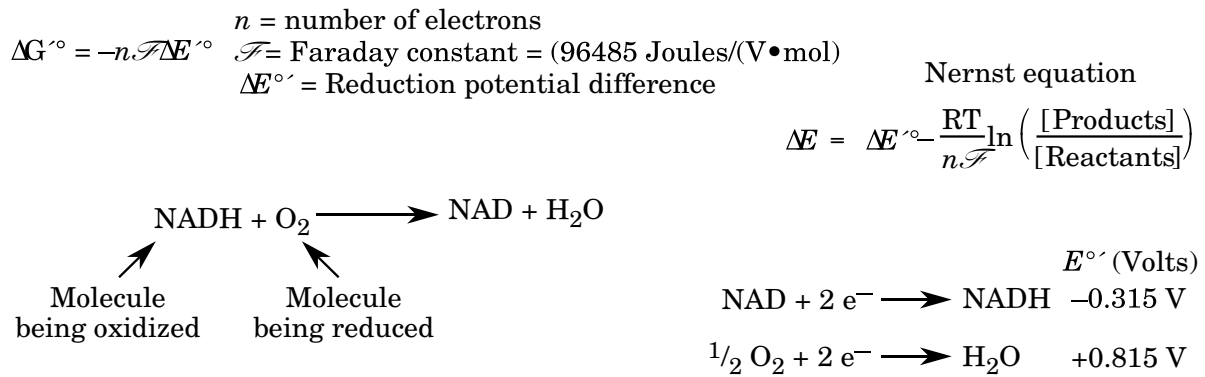
“Low Energy Phosphate”



Other Energetic Molecules



Redox Processes



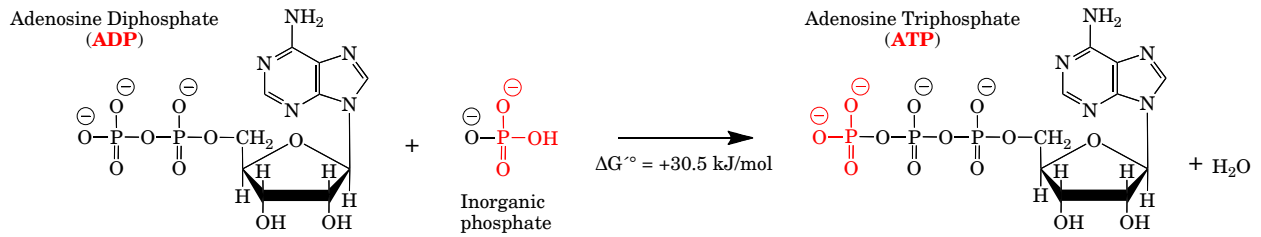
$$\Delta G^\circ = -n\mathcal{F}\Delta E^\circ = -n\mathcal{F}(E_{\text{reduced}}^\circ - E_{\text{oxidized}}^\circ) = -(2)(96485)[0.815 - (-0.315)] = -218.1 \text{ kJ/mol}$$

Membrane Energetics

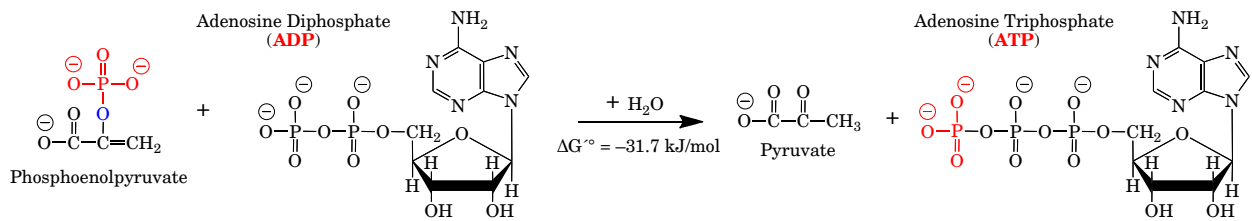
For **entering** a compartment

$$\Delta G = RT \ln \left(\frac{C_{in}}{C_{out}} \right) + Z\mathcal{F}\Delta\Psi$$

Oxidative Phosphorylation and Photo-phosphorylation



Substrate-Level Phosphorylation



ATP Buffers

