Marks
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- One of the most important reactions in living cells is the splitting of adenosine triphosphate (ATP) to adenosine diphosphate (ADP) and free phosphate (P_i):

$$ATP \rightleftharpoons ADP + P_i$$

Based on a standard state of 1 M, the value of $\Delta G°$ for this reaction at 37 °C is –33 kJ mol^{-1}. Calculate the value of the equilibrium constant for the reaction at this temperature.

Answer:

The following concentrations are typical in a living cell.

ATP: 5 mM	ADP: 0.1 mM	P_i: 5 mM

Under these conditions, calculate the energy per mole that is available from the splitting of ATP.

Answer: