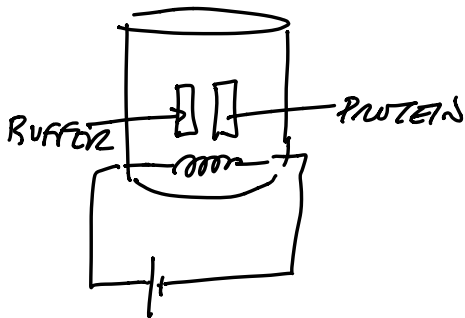


DIFFERENTIAL SCANNING CALORIMETRY (DSC) 10/11/19

LAST CLASS: IF WE KNOW ΔC_p , $\Delta H(T_{REF})$, AND $\Delta S(T_{REF})$ WE CAN OBTAIN $\Delta G(T)$. THIS LETS US LEARN ABOUT THERMODYNAMICS OF REACTIONS AT BIOLOGICAL TEMPERATURE FROM THINGS LIKE THERMAL MELTS. THE T DEPENDENCE OF ΔG ALSO TELLS US INFORMATION ABOUT MOLECULAR DRIVING FORCES.

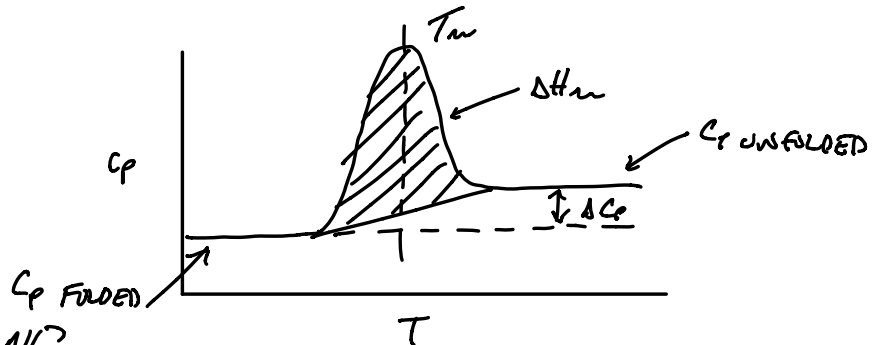
DSC IS A POWERFUL WAY TO DETERMINE THESE PARAMETERS.



APPLY HEAT AND MEASURE TEMPERATURE.

$$C_p = \delta q / dT$$

PLOT C_p VS T .



HOW DO WE GET ΔH ?

$$\delta q = dH$$

$$C_p = \delta q / dT$$

$$C_p dT = \delta q = dH$$

$$\int C_p dT = \Delta H \leftarrow \text{INTEGRATE NUMERICALLY.}$$

HOW DO WE GET ΔS_{REF} ?

$$@ T_m \Rightarrow \Delta G(T_m) = 0$$

$$\Delta G(T_m) = \Delta H(T_m) - T_m \Delta S(T_m)$$

$$0 = \Delta H(T_m) - T_m \Delta S(T_m)$$

$$\frac{\Delta H(T_m)}{T_m} = \Delta S(T_m)$$

FINALLY:

- BY CONVENTION, MOST PEOPLE IN THIS FIELD USE

$F \rightarrow U \dots$

- C_p FOLDED & C_p UNFOLDED BECAUSE WATER IS MORE ORDERED IN THE UNFOLDED STATE. ABSORBS APPLIED HEAT.