# Chemistry 2201 Exp: ENTROPY

**Determining the molar entropy change associated with the mixing of hat and cold water.**

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**Entropy is a measure of the disorder in the system.**

**Will be determining entropy changes associated with the mixing of hot and cold water.**

**$\Delta S_1$: cooling of hot water**
**$\Delta S_2$: cooling of dewar**
**$\Delta S_3$: heating of cold water**

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**Record mass of dewar assembly empty.**
**Record mass of dewar with hot water.**
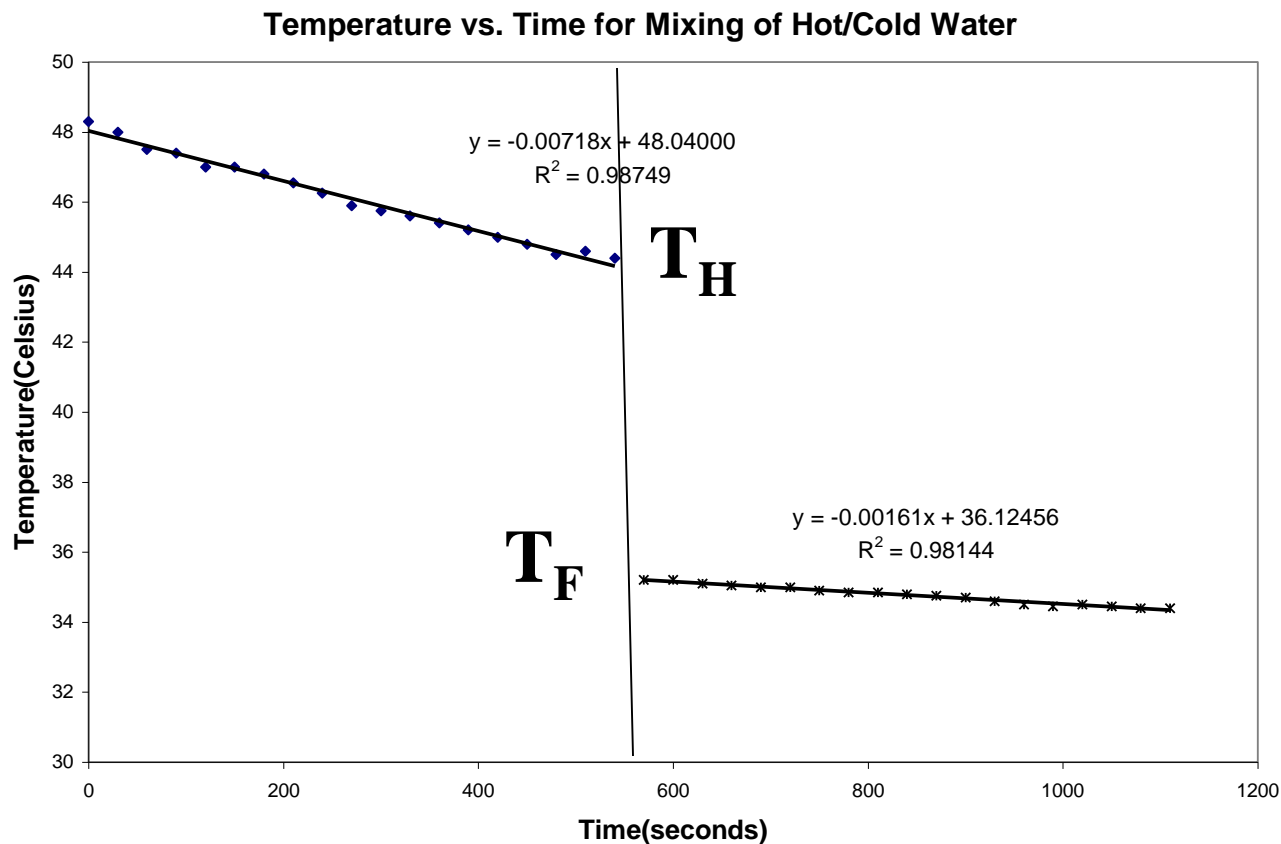**Record mass of dewar with hot and cold water.**

**Determine masses and moles($n_H$ and $n_C$).**

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**Determine temperatures($T_C$, $T_H$, $T_F$)**
**$T_C$ determined directly.**
**From plot of Temperature vs. time.**

**Temperature vs. Time for Mixing of Hot/Cold Water**

$y = -0.00718x + 48.04000$
$R^2 = 0.98749$

$T_H$

$y = -0.00161x + 36.12456$
$R^2 = 0.98144$

$T_F$

Temperature(Celsius)

Time(seconds)

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**Determine $C_{P,m,H}$ and $C_{P,m,C}$ from literature.**

$$C_{P,DA} = \frac{n_H C_{P,m,H}(T_F - T_H) + n_C C_{P,m,C}(T_F - T_C)}{(T_H - T_F)}$$

**NOTE: Sign of $C_{P,\,DA}$ important.**

**Calculate $\Delta S_1$, $\Delta S_2$, and $\Delta S_3$. Note significance of sign of each.**