Gibbs Mental Math

| | $\Delta H_{\rm sys}$ -T $\Delta S_{\rm sys}$ = $\Delta G_{\rm sys}$ | | |
|------------------------|---|-------------------|-----------|
| $\Delta oldsymbol{H}$ | ΔS | ΔG | At |
| - exothermic | + more disorder | ALWAYS spont. | Any temp |
| + endothermic | less disorder | + NEVER spont. | Any temp |
| – exothermic | less disorder | spont. | Low Temp |
| – exothermic | less disorder | + NOT spont. | High Temp |
| + endothermic | + more disorder | spont. | High Temp |
| + endothermic | + more disorder | + NOT spont. | Low Temp |

| | O > H4 | O < HA |
|--------------|---|--|
| Δ570 | Spontaneous at all T (DG<0) | Spontaneous at high T (when TDS is large) |
| V 2<0 | Spontaneous at low T (when TDS is small) | Non-spontaneous at all T (DG>0) |

Gibbs Mental Math

| $\Delta H_{\text{sys}} - T\Delta S_{\text{sys}} = \Delta G_{\text{sys}}$ | | | |
|--|---------------|---------------|-----------|
| ΔH | ΔS | ∆G | At |
| _ | + | _ | Any temp |
| exothermic | more disorder | ALWAYS spont. | , · |
| + | _ | + | Any temp |
| endothermic | less disorder | NEVER spont. | |
| _ | _ | _ | Low Temp |
| exothermic | less disorder | spont. | |
| _ | _ | + | High Temp |
| exothermic | less disorder | NOT spont. | |
| + | + | _ | High Temp |
| endothermic | more disorder | spont. | |
| + | + | + | Low Temp |
| endothermic | more disorder | NOT spont. | |

| | ΔH<0 | O < HA |
|---------------|---|--|
| Δ570 | Spontaneous at all T (DG<0) | Spontaneous at high T (when TDS is large) |
| D \$<0 | Spontaneous at low T (when TDS is small) | Non-spontaneous at all T (DG>0) |

Gibbs Mental Math

| | $\Delta H_{\text{sys}} - T \Delta S_{\text{sys}} = \Delta G_{\text{sys}}$ | | | |
|-------------|---|---------------|------------|--|
| Δ H | ΔS | ΔG | At | |
| _ | + | _ | Any temp | |
| exothermic | more disorder | ALWAYS spont. | Any temp | |
| + | _ | + | Any temp | |
| endothermic | less disorder | NEVER spont. | Any temp | |
| _ | _ | _ | Low Temp | |
| exothermic | less disorder | spont. | | |
| _ | _ | + | High Temp | |
| exothermic | less disorder | NOT spont. | nigh temp | |
| + | + | _ | High Temp | |
| endothermic | more disorder | spont. | night temp | |
| + | + | + | Low Temp | |
| endothermic | more disorder | NOT spont. | Low Temp | |

| | O > H4 | O < HA |
|---------------|---|--|
| ∆5 7 O | Spontaneous at all T (DG<0) | Spontaneous at high T (when TDS is large) |
| ⊅ \$<0 | Spontaneous at low T (when TDS is small) | Non-spontaneous at all T (DG>0) |