

Entropy  $\Delta S$  (J)

↳ Disorder. → spontaneously  
 $\oplus \Delta S$

Mar 20-8:42 AM

Spont rxn  $\ominus \Delta H$ ,  $\oplus \Delta S$

TEMPERATURE? - usually  $\uparrow T$

$\Delta G$   $\Rightarrow$  Definitive word on Spontaneity

$\overset{KJ}{\Delta G} = \overset{KJ}{\Delta H} - T \overset{J}{\Delta S}$

\* Watch UNITS\*

$J \rightarrow KJ$

KELVIN

Mar 20-8:47 AM

Spont  $\ominus \Delta H$ ,  $\oplus \Delta S$ ,  $\Delta G = ?$

$\Delta G = \Delta H - T \Delta S$

$\Delta G = \ominus - (\oplus \oplus)$

$= \ominus - (\oplus)$

$= \ominus + -$

$\Delta G = \ominus$

$\uparrow T$   
Better chance of  $\Delta G \ominus$

Mar 20-8:52 AM

## State functions

Route we take  $\rightarrow$  does NOT matter  
"much"

We care about starting + End  
point point

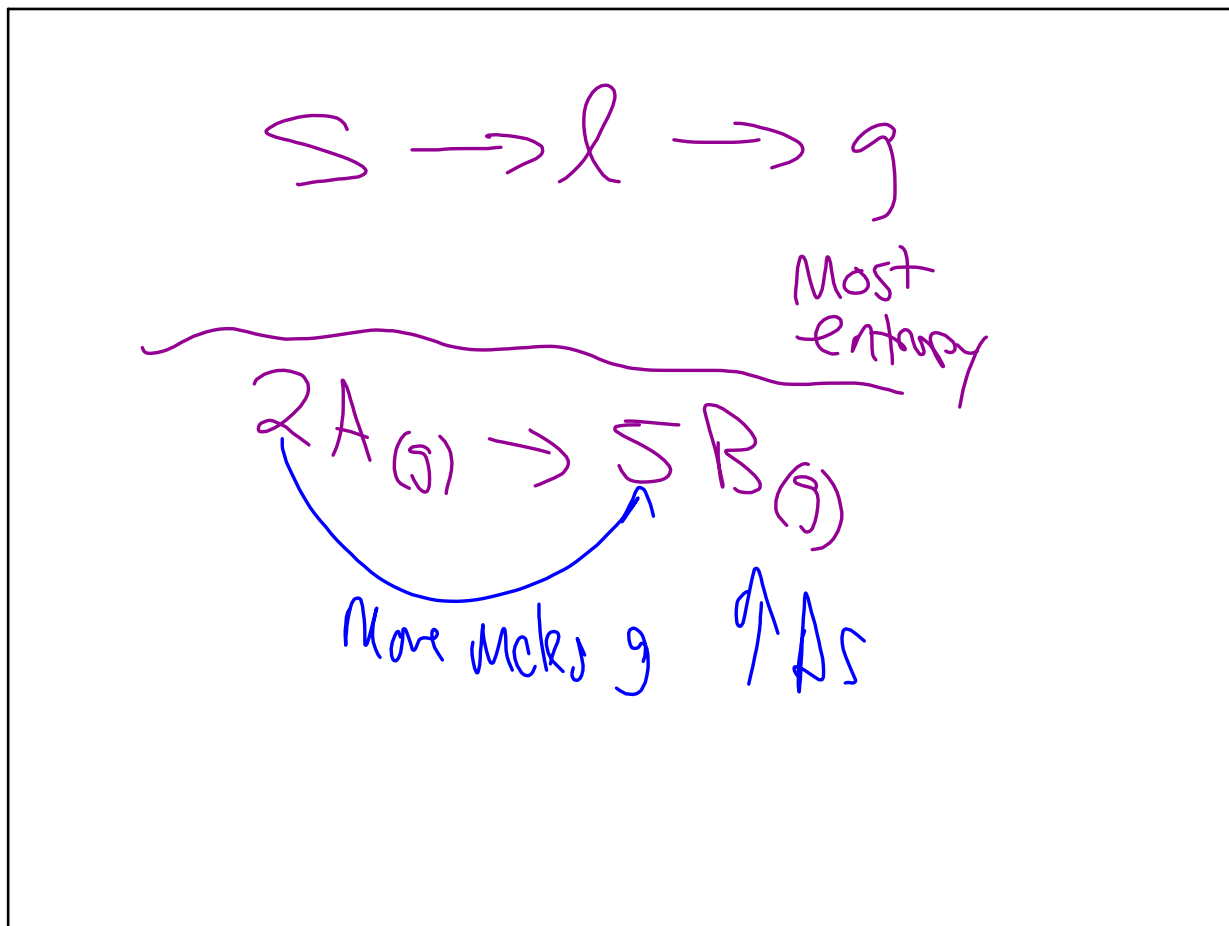
Mar 20-8:55 AM

$$\Delta H = n \sum \Delta H_{\text{prod}} - n \sum \Delta H_{\text{react}}$$

$\begin{matrix} \sum & & \sum & & \sum \\ \hookrightarrow & & \hookrightarrow & & \hookrightarrow \end{matrix}$

Coefficient of  
a BALANCED Eqn

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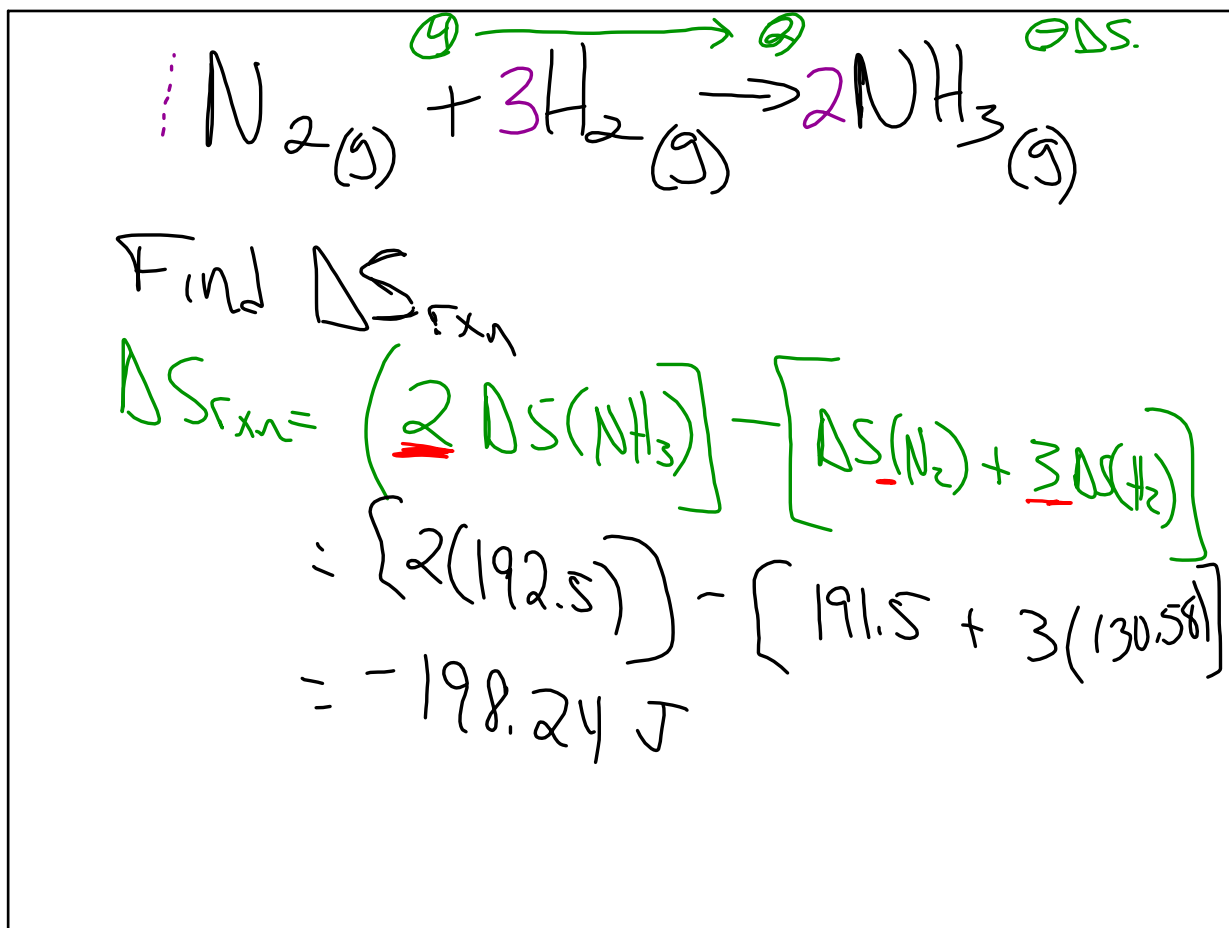


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Motion

Vibrational  
 Translational  
 Rotational

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Mar 20-9:03 AM

Any element in its elemental form  
(natural state)  
has a  $\Delta H = 0$

Requires NO energy to make it that stable.

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Relationship of  $\Delta G$  and  $K_{eq}$

$\Delta G \rightleftharpoons R \rightleftharpoons P$

$\Delta G = -RT \ln K$

Lots of P.

$K = \frac{[P]^{coeff.}}{[R]^{coeff.}}$

Gibbs      Temp.

$8.314 \text{ J Mol}^{-1} \text{ K}^{-1}$

$8.314 \times 10^{-3} \text{ kJ Mol}^{-1} \text{ K}^{-1}$

Units

Mar 20-9:11 AM

19 / 41, 58, 62, 65

Mar 20-9:16 AM