



Entropy

Entropy of a System - ΔS_{SYSTEM}



You get an _____ in entropy with

-
-
-
-

Calculating ΔS

e.g.



+

-





Gibbs Free Energy - ΔG

Is a reaction feasible / spontaneous?



A Qualitative View

①

②

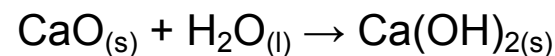
ΔH	ΔS	Feasible?

☆☆
NB!!
☆☆



EXAMPLE GIBBS CALCULATIONS

1. Calcium Oxide reacts with water to form Calcium Hydroxide



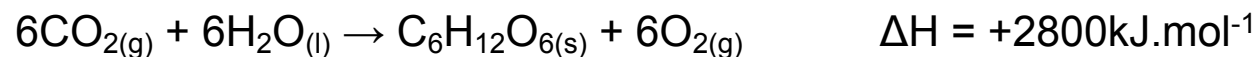
Thermodynamic Data:	$\Delta H_f / \text{kJ.mol}^{-1}$	$S / \text{J.K.mol}^{-1}$
$\text{CaO}_{(s)}$	-636.5	39.7
$\text{H}_2\text{O}_{(l)}$	-285.9	70.0
$\text{Ca(OH)}_{2(s)}$	-986.6	76.1

- a) Calculate the Enthalpy changes for the reactions.
- b) Calculate the Entropy Change for the reactions.
- c) At what temperature would this reaction **NOT** be feasible?



EXAMPLE GIBBS CALCULATIONS

2. Plants are able to produce Glucose from Carbon Dioxide and water.



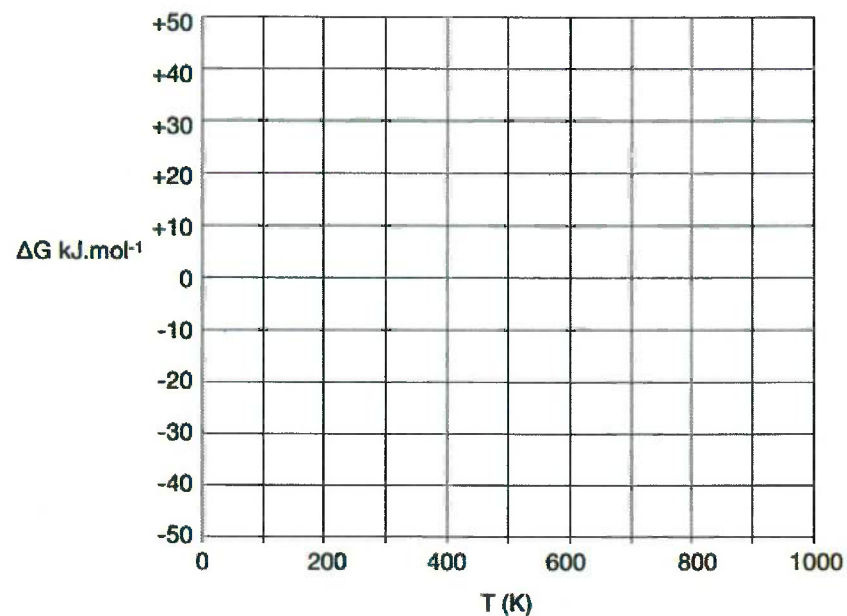
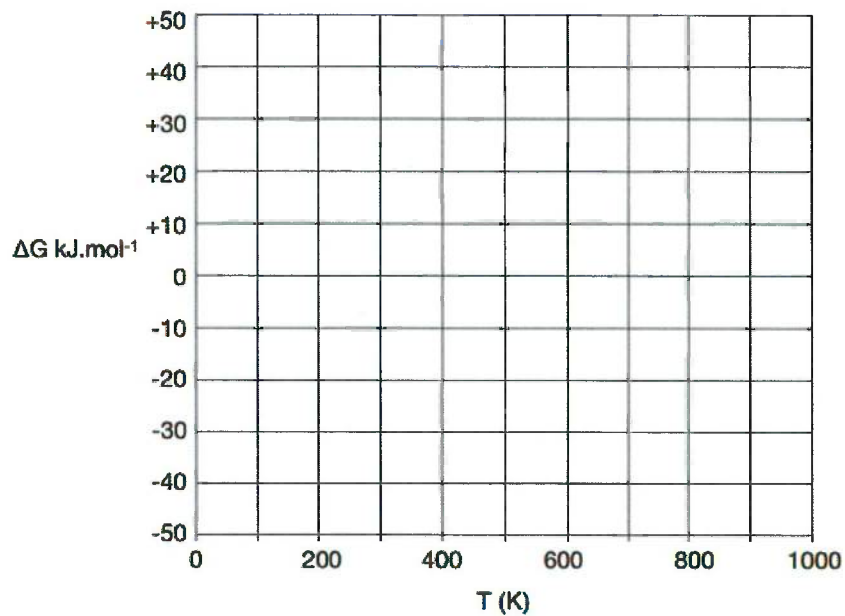
	$\text{CO}_{2(g)}$	$\text{H}_2\text{O}_{(l)}$	$\text{C}_6\text{H}_{12}\text{O}_{6(s)}$	$\text{O}_{2(g)}$
S / J.K.mol ⁻¹	214	70	218	205

- Calculate the Entropy Change for the reaction.
- Calculate ΔG for the reaction at 298K.
- Explain why this reaction is **NOT** feasible at **ANY** temperature.



The ΔG Vs T Graph

1 2 3 4 5



$\Delta H =$

$\Delta S =$

$C =$