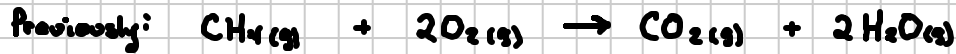


Lecture 18.4: Temperature Thresholds

Note Title

11/1/2011



$$\Delta S_{\text{univ}} = -5.3 \text{ J/Kmol} + \frac{802.5 \text{ KJ/mol}}{298.15 \text{ K}} = +2.687 \text{ KJ/molK} > 0$$

Spontaneous.

T	ΔS_{univ}	
298.15K	+2.687 KJ/molK	> 0 spontaneous.
1000 K	+0.797 KJ/molK	> 0 spontaneous
10,000K	+0.075 KJ/molK	> 0 spontaneous
200,000K	-0.00138 KJ/molK	< 0 non-spontaneous

Question: At what T will the reaction become non-spontaneous?

$$\Delta S_{\text{univ}} = 0 = -5.3 \times 10^{-3} \text{ KJ/molK} + \frac{802.5 \text{ KJ/mol}}{T_{\text{Th}}}$$

Threshold Temp

$$T_{\text{Th}} = 151,000 \text{ K}$$

