

Day-7

→ continuing last day's problem:

Ok, that's wrong! 2nd iteration!

$$T_{ad} = 2300 \text{ K}$$

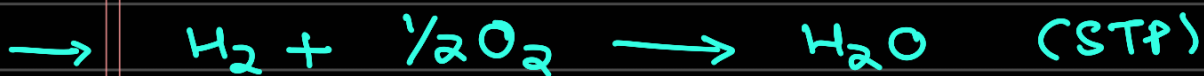
$$\text{let } T = \frac{300 + 2300}{2} = 1300 \text{ K}$$

$$H_R(T_R) = -74831 \text{ kJ}$$

$$\begin{aligned} H_P(T) = & -393546 - 483690 \\ & + (T - 298) (56.984 + 45.027 \times 2 \\ & + 34.113 + 7.52) \end{aligned}$$

$$\text{Now, } H_R = H_P$$

$$\Rightarrow T = 2286.278 \text{ K}$$



$$T_{ad, \text{guess}} = 3700 \text{ K}$$

$$H_R(298 \text{ K}) = 0 + 0 = 0$$

$$C_p \text{ at } \frac{300 + 3700}{2} \text{ K} = 2000 \text{ K}$$

$$H_P(T_{ad}) = -241845 + 51.143 (T_{ad} - 298)$$

$$\begin{aligned} \Rightarrow T_{ad} &= \frac{241845}{51.143} + 298 \\ &= 5026.8 \text{ K} \end{aligned}$$

2nd iteration:

4

$$T_{ad} = \frac{3700 + 5000}{2} = 4350 \text{ K}$$

(guess)

Take c_p at $\frac{3700 + 4300}{2} \text{ K}$

$$= 4000 \text{ K}$$

$$\text{so } T_{ad} = 298 + \frac{241845}{58.026}$$

$$= 4465.873 \text{ K}$$

Why such a 'bad guess'?

☆ Dissociation of products at high temp. at ambient pressure.



→	Species	Reactants	Products
	H ₂	0.667	0.295
	O ₂	0.333	0.1457
	H ₂ O	0	0.5628