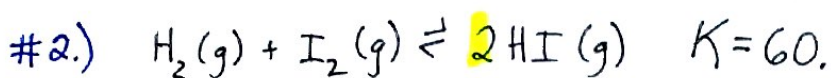


AP Unit 5 Test Review: Class Version



$$Q = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]} = \frac{3^2}{(0.3)^2} = \frac{9}{0.09} = 100$$

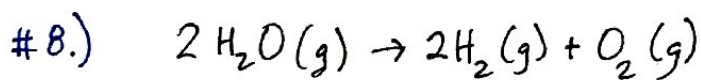
} $60 < 100$
 $K < Q$ \Rightarrow Rxn will spont.
 \Rightarrow make more reactants = $+\Delta G$
(NOT favorable)

#5.) $\Delta G = -RT \ln K$

$$\Rightarrow \ln K = \frac{-\Delta G}{RT} = \frac{-(-77,000 \frac{\text{J}}{\text{mol}})}{(8.314 \frac{\text{J}}{\text{mol} \cdot \text{K}})(298 \text{K})}$$

b/c ΔG°] std conditions

$$\ln K = +31.079 \Rightarrow K = e^{+31.079} = \boxed{3.1 \times 10^{13}}$$



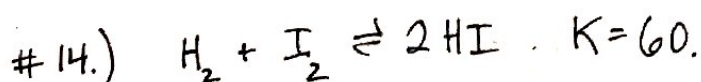
$$\Delta S^\circ = \sum S^\circ(\text{prod}) - \sum S^\circ(\text{react.})$$

$$= [2 \cdot \text{H}_2 + \text{O}_2] - [2(\text{H}_2\text{O})]$$

$$= [2(131) + 205] - [2(189)] = \boxed{+89 \frac{\text{J}}{\text{mol} \cdot \text{K}}}$$

#11.) $\Delta G = \Delta H - T\Delta S$

$$= -93 \frac{\text{kJ}}{\text{mol}} - (298 \text{K})(-0.198 \frac{\text{kJ}}{\text{mol} \cdot \text{K}}) = \boxed{-34 \frac{\text{kJ}}{\text{mol}}}$$



$$Q = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]} = \frac{(1.0)^2}{(2.0)^2} = \frac{1}{4} = 0.25$$

} $60 > 0.25$

$K > Q$

\Rightarrow Rxn Spont.,
shifts to make more products
($-\Delta G$) \Rightarrow therm. favorable!